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e- ÖZET KİTABI
e- PROCEEDINGS

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KONGRE BİLİMSEL PROGRAM	
2 KASIM 2018 Cuma	
08:30-09:00	Kayıt
09:00-10:00	**Açılış Konuşmaları** *Mintaze Kerem Günel* *Feride Bilir* *Candan Algun* *Ayşe Ardalı*
10:00-10:30	**Açılış Konferansı** *Oturum Başkanı: Banu Anlar* Bobath / NDT Temelleri ve gelişimi *Margaret Mayston*
10:30-11:00	*Ara*
11:00-12:30	**Panel 1 - Her Yönüyle Riskli Bebek** *Oturum Başkanları: Margeret Mayston, Nur Aydınlı*
11:00-11.30	Tehlikeli başlangıçlar: Yüksek riskli yenidoağan olmak *Zeynep İnce*
11:30-12:00	Riskli bebeklerde beyin plastisitesi ve değerlendirme yöntemleri *Banu Anlar*
12:00-12:30	Bebeklerde postural kontrol kavramı, *Gay Girolami*
12:30-13:30	*Öğle Yemeği*
13:30-15:00	**Panel 2 - Gelişimin çok yönlü incelenmesi** *Oturum Başkanları: Zeynep İnce, İpek Akman*
13.30-14.00	Bebeklerde postural kontrolün sağlanması *Gay Girolami*
14:00-14:30	Bebeklerde görsel duyu riskleri *HüseyinYetik*
14:30-15:00	Erken dönem ergoterapide Bobath / NDT uygulamaları – Bütüncül değerlendirme *Vardit Kindler*
15:00-15:30	*Ara*
15:30-16:00	**Konferans-1** *Oturum Başkanı: Gay Girolami* Erken Dönem ergoterapide Bobath/NDT uygulamaları – Müdahaleyöntemleri *Vardit Kindler*
16:00-16:30	**Konferans-2** *Oturum Başkanı: Yüksel Yılmaz* Normal gelişim: Nitelik mi, nicelik mi, her ikisi mi? *Margaret Mayston*
16:30-17:30	**Panel 3 - Bilimden kliniğe erken çocukluk döneminde Bobath/NDT** *Oturum Başkanları: Mintaze Kerem Günel, Feride Bilir*
16:30- 16:50	Hemiplejik bebeklerde zorunlu kıstlayıcı terapi ile Bobath / NDT birleştirilebilir mi? *MeltemYazıcı*
16:50- 17:10	Bobath / NDT'de Motor Öğrenmenin yeri *Ayşe Numanoğlu Akbaş*
17:10- 17:30	Yoğun bakımdan taburculuğa Bobath / NDT *DuyguTürker*
17:30-18:30	**Sözel sunumlar** *Oturum Başkanları: Çetin Sayaca, Ayşe Numanoğlu Akbaş* **S01-S02-S03-S04-S05-S06-S07**

3 KASIM 2018 Cumartesi

09.00- 10:30	**Panel 4 - Gelişim** *Oturum Başkanları: Ayşe Korkmaz Toygar, Feryal Subaşı*
09.00-09.30	Gelişim teorileri ve Bobath / NDT *Mintaze Kerem Günel*
09.30-10.00	Gelişimsel pediatrist gözüyle riskli bebek *Elif Özmert*
10:00-10.30	GMs Bobath / NDT uygulamalarına yön verir mi? *Aysu Kahraman*
10:30-11.00	*Ara*
11:00-11:30	**Konferans-3** *Oturum Başkanı: Serap İnal* Erken dönemde dil konuşma terapisi Bobath / NDT uygulamaları, bütüncül değerlendirme *Marleen D'hondt*
11:30-12:00	**Konferans-4** *Oturum Başkanı: Nilüfer Eldeş* Bobath / NDT yaklaşımı, erken dönemde duyusal sistemleri nasıl etkiler ? *Feride Bilir*
12:00-12.30	**Konferans-5** *Oturum Başkanı: Ekin Akalan* Erken çocukluk döneminde fonksiyonel sınıflama sistemleri *Gönül Acar*
12:30-13:30	*Öğle Yemeği*
13:30-14:00	**Konferans-6** *Oturum Başkanı: Devrim Tarakçı* Bebeklerde dil ve konuşma terapisi Bobath / NDTuygulamaları ve Müdahale *Marleen D'hondt*
14:00-15:00	**Panel 5 - Ailenin önemi** *Oturum Başkanları: Elif Özmert, Dilşad Foto Özdemir*
14:00-14:30	Anne - Bebek ilişkisi *Dilşad Foto Özdemir*
14:30-15:00	Bobath / NDT uygulamalarında hedefe yönelik aile eğitimi *Nilay Çömük Balcı*
15:00-15:30	*Ara*
15:30-16:30	**Klinikten vaka çözümlemeleri** *Oturum Başkanları: Semiramis Özyılmaz, Gönül Acar* *Kübra Seyhan* *Büşra Kepenek Varol* *Filiz Sayal*
16.30-17:30	**Sözel sunumlar** *Oturum başkanları: Duygu Türker, Meltem Yazıcı* **S08-S09-S10-S11-S12-S13-S14-S15**
17:30-	**Kapanış** Türkiye'de Pediatrik Bobath /NDT eğitiminin geleceği: Neredeyiz? **Nörogelişimsel Tedavi (Bobath) Terapistleri Yönetim Kurulu- Açık kürsü**
	Sunum ödülleri

CONGRESS SCIENTIFIC PROGRAM

2 NOVEMBER 2018 Friday	
08:30-09:00	Registration
09:00-10:00	**Opening Speeches** *Mintaze Kerem Günel* *Feride Bilir* *Candan Algun* *Ayşe Ardalı*
10:00-10:30	**Opening Conference** *Chair: Banu Anlar* Bobath / NDT : essence and evolution *Margaret Mayston*
10:30-11:00	Break
11:00-12:30	**Panel 1 - Risky Baby with all sides** *Chairs: Margaret Mayston, Nur Aydınlı*
11:00-11.30	Dangerous beginnings: Being a high risky newborn *Zeynep İnce*
11:30-12:00	Brain plasticity in risky babies and evaluation methods *Banu Anlar*
12:00-12:30	Postural control in babies *Gay Girolami*
12:30-13:30	*Lunch*
13.30-15.00	**Panel 2 - Investigataion of development with multidirectional** *Chair: Zeynep İnce, İpek Akman*
13.30-14.00	Providing postural control in babies *Gay Girolami*
14:00-14:30	Vision sensory risks in babies *HüseyinYetik*
14:30-15:00	Bobath/NDT Occupational Therapy applications in early period – Holistic evaluation*Vardit Kindler*
15:00-15:30	*Break*
15:30-16:00	**Conference -1** *Chair: Gay Girolami* Bobath/NDT Occupational Therapy applications in early period - Intervention *Vardit Kindler*
16:00-16:30	**Conference-2** *Chair: Yüksel Yılmaz* Typical Development: quantity, quality- or both *Margaret Mayston*
16:30-17:30	**Panel 3 - From science to clinic Bobath/NDT in early childhood** *Chair: Mintaze Kerem Günel, Feride Bilir*
16:30- 16:50	Can CIMT and Bobath/NDT join in babies with hemiplegia? *MeltemYazıcı*
16:50- 17:10	Motor learning in Bobath / NDT *Ayşe Numanoğlu Akbaş*
17:10- 17:30	Bobath / NDT from intensive care to discharge *DuyguTürker*
17:30-18:30	**Oral presentations** *Chairs: Çetin Sayaca, Ayşe Numanoğlu Akbaş* **S01-S02-S03-S04-S05-S06-S07**

3 November 2018 Saturday	
09.00- 10:30	**Panel 4 - Development** *Chairs: Ayşe Korkmaz Toygar, Feryal Subaşı*
09.00-09.30	Developmental theories and Bobath / NDT *Mintaze Kerem Günel*
09.30-10.00	Risky baby from view of a developmental pediatrist *Elif Özmert*
10:00-10.30	Does GMs evaluation give a direction to Bobath therapy? *Aysu Kahraman*
10:30-11.00	*Break*
11:00-11:30	**Conference -3** *Chair: Serap İnal* Speech and language therapy Bobath applications in early period- holistic evaluation *Marleen D'hondt*
11:30-12:00	**Conference -4** *Chair: Nilüfer Eldeş* Bobath / NDT approach, the main effects of sensory systems in early period *Feride Bilir*
12:00-12.30	**Conference -5** *Chair: Ekin Akalan* Functional classification systems in babies *Gönül Acar*
12:30-13:30	*Lunch*
13:30-14:00	**Conference-6** *Chair: Devrim Tarakçı* Speech and language therapy Bobath applications in early period- intervention *Marleen D'hondt*
14:00-15:00	**Panel 5 - Importance of family** *Chair: Elif Özmert, Dilşad Foto Özdemir*
14:00-14:30	Mother – baby relation *Dilşad Foto Özdemir*
14:30-15:00	Goal directed parent education in Bobath / NDT interventions *Nilay Çömük Balcı*
15:00-15:30	*Break*
15:30-16:30	**Clinical case analysis** *Chairs: Semiramis Özyılmaz, Gönül Acar* *Kübra Seyhan* *Büşra Kepenek Varol* *Filiz Sayal*
16.30-17:30	**Oral presentations** *Chairs: Duygu Türker, Meltem Yazıcı* **S08-S09-S10-S11-S12-S13-S14-S15**
17:30	**Closing** The future of Pediatric Bobath Education in Turkey: Where are we? **NGTTD Executive members and participants – Open discussion**
	Presentation awards

KONUŞMA ÖZETLERİ / Summaries

Bobath / NDT: Essence and Evolution

Dr Margaret Mayston AM PhD.

It is now 70 years since the Bobaths began their pioneering work in the management of people with neurological disabilities. During that time a world-wide network of Bobath/NDT therapists developed, and Bobath/NDT associations formed in many countries.
Bobath/NDT is currently viewed by many as outdated, passive and not functionally relevant to clinical practice (Tyson, 2018). Practitioners have developed Bobath/NDT in many different directions, resulting in a diversity of approach. There is no universally agreed definition of what Bobath/NDT is, or what it means to be a Bobath/NDT-trained therapist. Given this diversity, the essence of 'What is Bobath?' cannot be universally identified, agreed, practised, or taught and ultimately cannot submit itself to rigorous research (Mayston, 2016). Much of clinical Bobath practice is also part of mainstream intervention causing greater confusion.
The essence of the clinical application of Bobath has not significantly changed since its inception, but the theory underlying it has progressed considerably in the last 70 years. The fields of neuroplasticity, motor control, motor learning, muscle physiology and biomechanics and typical development all offer sound theoretical basis for the current understanding and practice of Bobath/NDT (Mayston, 2014). In addition the International Classification of Functioning Disability and Health (ICF; WHO 2002;2007) is an ideal framework in which to embed Bobath.
This presentation will explore the changes in Bobath over time, overlap of Bobath with mainstream intervention, consider threats to its continued practice, and will attempt to identify what is uniquely Bobath- its essence.

Typical Development: Quantity, Quality- or Both?

Dr Margaret Mayston AM PhD.

Why is typical development relevant? A detailed knowledge of typical development (TD) lies at the heart of the understanding and practice of the Bobath approach. The standard milestone approach to development was found to be wanting, resulting in a detailed study of the ''how', 'what', 'when' and 'why' of typical development by the Bobaths. This led them to stress that clinicians take not only a vertical approach (milestones) to development, but a stage like view by also considering the horizontal perspective of the developmental stages (Alexander et al, 1991; Bobath & Bobath, 1975; Bobath, 1967). They also advocated a 'what makes it [a particular skill] possible' approach, and rejected the linear nature of infant development with respect to attainment of activity against gravity, otherwise referred to as the ontogenetic sequence of development.
Each stage is characterized by a new ability or skill, which builds on previous activity, prepares for the next level, and also refines earlier skills.
The early developmental theories of reflexes and behaviours built up by pre-destined neural developmental events (Gale, 2004 [Piaget]; McGraw, M 1989), were superseded by dynamic systems theory with its environmental/experiential focus, and more recently the nature-nurture theory of Edelman and others has become dominant (Hadders-Algra, 2000).
The stage-like view of TD, encourages the therapist to understand the essential pre-requisites for a task in the 3 domains of mobility, grasp and manipulation and oral motor functioning, and urges a consideration of not only quantity, but quality of activity, and the implications of these for future skill acquisition.

Riskli Bebeklerde Beyin Plastisitesi ve Değerlendirme Yöntemleri

Prof Dr Banu Anlar

Çocuk Nörolojisi Uzmanı, Hacettepe Tıp Fakültesi

"Plastisite" terimi beynin deneyim ve uyaranların etkisiyle değişebilme özelliğini yansıtır. Bu özellik beyinde yapısal ya da işlevsel değişikliklerle sağlanır ve gelişimin erken evrelerinde en belirgindir.
Plastisitenin en önemli etkileri öğrenme sürecinde ve zedelenmelerden sonraki iyileşme dönemlerinde görülmektedir. "Riskli bebek" tanımına uygun olan, doğum öncesi, sırası ya da sonrasında olumsuz etmenlere maruz kalmış bulunan bebeklerde plastisite iki yönü ile ele alınmalıdır:
1) İyileşme aracı olarak, reaktif plastisite:

Yaşamın erken dönemlerinde oluşan zedelenmelerden sonra beyinde sıklıkla başka alanlar ve bağlantı yolları gelişerek işlevi üstlenirler. Örneğin beynin baskın yarıküresindeki bir lezyonda dil alanı karşı tarafa kayarak çocukta anlama-konuşma normal gelişebilir. Bunu kolaylaştırmak, normal dengeyi tekrar oluşturmak için zedelenen beyin bölgesini aktive edip sağlıklı tarafı atıl bırakmak hedeflenir. Örneğin bimanual tedaviler, sağlam taraf ekstremiteyi kısıtlama, ya da beyne yönelik transkraniyal manyetik uyarım gibi teknikler klinik ve laboratuvar koşullarında yapılan nöromodülasyon uygulamalarıdır.
2)Önlem aracı olarak, girişimlerle uyarılan plastisite:
Beyinde zedelenme gösterilmemiş ya da belirti vermemiş bile olsa, riskli bebeklerde böyle bir ihtimal söz konusu olduğundan uyaranları arttırarak zedelenmeye aday bölgenin ve çevre bölgelerin sinir hücrelerini, hücreler arası bağlantılarını korumak mümkün olabilir.
Gerek risk altında bulunan bebeklerde önlem olarak başlanan, gerekse de motor sorunlar dikkati çektiğinde düzeltici olarak verilen destek programlarında “kritik dönem” ya da “duyarlı dönem” olarak tanımlanabilecek belirli yaş sınırları aşılmamış olmalıdır. Bu nedenle dikkatli gözlem yapmak, girişime başlama eşiğini düşük tutmak, “riskli bebek” ve “plastisite” terimlerini kavramış olmak büyük önem taşır.

Assessing Postural and Motor Performance Issues in High Risk Infants

Gay L. Girolami, PT, MS, PhD, c/NDT

Clinical Professor and Director of Professional Education
Department of Physical Therapy, University of Illinois at Chicago

NDT/Bobath Senior Instructor
Neuro-Developmental Treatment Association, USA

Although developments in neonatal care have increased the survival rates for infants born preterm, adverse neurodevelopmental outcomes continue to be a concern. Infants at risk for postural and motor abnormalities resent unique assessment considerations for health care professionals. There are many choices to be made including when to assess, which tool or tools to administer, and how to interpret outcomes to ensure that infants in need receive the earliest possible intervention.
Each health care professional is responsible for a specific domain as it relates to the care and assessment of high risk infants. Physical and occupational therapists are most involved in assessing the postural and motor competencies of these infants. One method we use to assess motor performance is observation of movement. Therefore, it is imperative that we understand and recognize the components of typical motor and postural control. Honing these skills creates a comparator for our observations allowing us to apply clinical judgement for the identification of infants whose motor and postural performance is atypical or abnormal.
To validate our clinical observations, we also select and administer standardized outcome measure. Consequently, it is critical for us to understand the purpose and intended use of the available measurement tools thus ensuring that the tool we select is the best fit for the intended purpose of our assessment. Additionally, it is critical that we practice administration of the tool to gain the expertise needed to reliably administer these tools in practice.
During this presentation a historical perspective on clinical observation will be discussed to demonstrate the importance of observation skills and their relationship to the development of two standardized assessment measures; the General Movement Assessment and the Test of Infant Motor Performance. This will be followed by a comparison of the two measurement tools to demonstrate how they can be utilized in concert to identify atypical posture and provide direction in the diagnosis and treatment of high risk infants.

Intervention for Infants with Identified Postural and Movement Concerns

Gay L. Girolami, PT, MS, PhD, c/NDT

Clinical Professor and Director of Professional Education
Department of Physical Therapy, University of Illinois at Chicago

NDT/Bobath Senior Instructor
Neuro-Developmental Treatment Association, USA

Despite advances in neonatal care for preterm and high risk infants, many infants do not reach discharge age without concerns for or with identified, abnormalities of posture and movement. In the previous presentation we discussed options for assessment and how assessment results will guide our decision making regarding the need

for referral and treatment. The next step is the selection of the type, duration and intensity of that treatment intervention.
How are decisions regarding interventions for risk infants developed? We may look to postural control and movement research to expand our understanding regarding the development of postural control in infants. We may read studies describing successful intervention protocols for high risk infants. However, with regard to intervention studies, there is no conclusive evidence that clearly informs our clinical decision making. At best, we are in a state of information gathering. Therefore, it is critical to gather and sort information from postural studies and to identify the common features of successful research intervention protocols. Synthesis and application of this information should be integrated with our clinical experience to inform our clinical decision making to aid in the design and implementation of effective treatment interventions for high risk infants.
This presentation will provide the participant with an overview of information on the development of postural control and the common features in successful research studies to improve motor and postural performance in high risk infants. How this information can be integrated in the development of interventions to improve posture and motor performance in infants will be offered.

Ot Bobath Applications in Babies - Holistic Evaluation and Intervention Methods

Vardit Kindler, OTR, MEd

Dvorah Agmon Preschool Development Center, Jerusalem, Israel
OMER- The center for Augmentative and Alternative Communication and Assistive Technology.

In addition to the Cerebral palsy definition published in 2007, this is an opportunity to offer the Occupational Therapy perspective on the clinical entity of Cerebral Palsy as a developmental lifelong condition and holding that thought when using a transdisciplinary model of intervention . A combination of different models and frames of reference when addressing occupational behavior of the infant and young child will be highlighted together with the Bobath concept/approach in mind. Bobath and Bobath called their treatment approach a living concept because they expected it to change and develop over time. They made many changes to the treatment over the years to make it more active and functional. One of the remarkable tools used in the Bobath approach is clinical reasoning within the ecological settings of practice. Clinical reasoning is necessary to explicate the tailoring of interventions for one child compared to another. An emphasis will be made on the need for a detailed description of the different components in addition the motor ones that enable activity and participation of children with cerebral palsy and in turn how those components are part of individual tailoring of the interventions planned and executed. In the second part of the presentation various vignettes will be presented to identify such components for the “Best fit” individually tailored Occupational therapy intervention sessions.
References:
Ego, A, Lidzba, K, et al., (2015) Visual – perceptual impairment in children with cerebral palsy: a systematic review. Developmental Medicine and Child Neurology.57 (2) 46 - 51
Field, D.A., Miller, W.C., Ryan, S.E., (2015) Measuring Participation for Children And Youth with Power Mobility Needs: A Systematic Review of Potential Health Measurement Tools. *Archives of Physical Medicine and Rehabilitation* Mar;97(3):462-477
Lew, H., Lee,H,s., et al., (2015) Possible linkage between visual and motor development in children with cerebral palsy. *Pediatric Neurology*, 52(3), 338-343
Livingstone, R., & Paleg, G. (2014). Practice considerations for the introduction and use of power mobility for children. *Developmental Medicine & Child Neurology*, *56*(3), 210-221.
Rosenbaum, P and Rosenbloom, L (2012) *Cerebral Palsy from Diagnosis to Adult Life* Mac Keith, London

Hemiplejik Bebeklerde Zorunlu Kıstlayıcı Terapi ile Bobath / NDT Birleştirilebilir mi?

MeltemYazıcı

Santral sinir sistemi (SSS) lezyonlarında yaşamın ilk yılları beyin gelişimi ve plastisitesi açısından önemlidir. İlk bir yaşta aktivasyon ve stimulasyon ile duyu ve motor korteksdeki nöral aktivitenin, sinaptik ağlanmanın arttığı, kortikospinal sistemin gelişiminin desteklendiği bilinmektedir. SSS lezyonu görülen, gelişimsel risk taşıyan bebeklerde erken dönemdeki müdahaleler ile elde edilen gelişimler nöroplastisitesinin bir sonucudur.
Erken dönem rehabilitasyon uygulamaları arasında motor öğrenme temelli Nörogelişimsel Terapi (NDT)/Bobath ve Zorunlu Kısıtlayıcı Hareket Terapisi (CIMT) en yaygın kullanılan yaklaşımlardır. NDT, çocuğun aktif öğrenmesinin sağlandığı, öğrenme temelli plastisiteyi geliştiren, bütüncül bir problem çözme yaklaşımıdır. CIMT, özellikle hemiplejik Serebral Plasi’li (hSP) çocuklarda unilateral ekstremite kullanımının geliştirilmesinde kullanılan, kanıt

temelli sonuçlar gösteren bir yöntemdir. Bebeklerde uygulama koşullarının düzenlendiği şekliyle Baby-CIMT olarak bebeklerde kullanılmaktadır.
Baby-CIMT ve NDT, hSP'li çocuklarda hareket performansını geliştirmek için bilimsel kökeninde ortak motor öğrenme ve motor kontrol teorilere dayanmaktadır. Her iki yöntemde de fonksiyonel işlere odaklanılması, çocuğun aktif katılımının ve motivasyonunun sağlanması, öğrenme için gerekli olan çok sayıda ve değişik koşullarda hareket tekrarının yapılmasıyla aktivite temelli plastisite hedeflenir. Baby-CIMT, üst ekstremite fonksiyonuna odaklanan bir yöntem olarak üst ekstremitenin yoğun eğitimini esas alırken, NDT üst ekstremite fonksiyonlarının geliştirilmesi yanında çocuğa bütüncül yaklaşımıyla motor fonksiyonu geliştirmek için postüral kontrolü geliştirmeyi de hedefler. Postüral kontrolün üst ekstremite fonksiyonlarını geliştiren uzun vadeli sonuçları gelişimin ve hareket kalitesindeki artışın devamlılığını da sağlar. Dayandığı temeller ve yaklaşım prensipleri açısından birbirini destekleyen bu yöntemlerin birlikte kullanımı çocuğun gelişiminin desteklenmesi, üst eksremite fonksiyonelliğinin geliştirilmesinde kısa ve uzun vadede daha etkin sonuçlar gösterebilir.

Bobath / NDT'de Motor Öğrenmenin Yeri

Ayşe Numanoğlu Akbaş

Cumhuriyet Üniversitesi, Sağlık Bilimleri Fakültesi, Fizyoterapi ve Rehabilitasyon Bölümü, Sivas, Türkiye

Motor öğrenme; hareket yeteneğinde beceri gerektiren, tecrübe veya pratikle oluşan ve kalıcı değişikliklere yol açan bir süreç olarak tanımlanmaktadır. Pratik uygulamalar boyunca motor davranışta meydana gelen geçici değişiklikler performans olarak tanımlanmakta, motor öğrenmeden bahsedilebilmesi için bu değişikliklerin kalıcı olması gerekmektedir. Motor öğrenmenin gerçekleşebilmesi için kişinin uygulamaya aktif katılımı, uygulamada anlamlı amaçların yer alması ve motor hareketin sık tekrarı önemlidir. Motor öğrenme çalışmaları sırasında; motor görevin uygulanma sıklığı, hastaya verilen geri bildirim (içsel/dışsal), uygulama koşulları (toplu uygulamalar/dağınık uygulamalar, sürekli uygulamalar/değişken uygulamalar, engellenen uygulamalar/rastgele uygulamalar, bütüncü uygulamalar/parçalı uygulamalar), çevresel faktörler, uygulanan fiziksel destek gibi birçok değişken çalışmadan elde edilecek sonuçları değiştirebilir. Motor öğrenmenin optimize edilmesi için bu değişkenlerin tedavi sırasında nasıl kullanılması gerektiği çocuk/bebeklerde ve yetişkinlerde farklık göstermektedir. Çocuk/bebeklerde Nörogelişimsel Tedavi uygulamaları sırasında motor öğrenme prensiplerinin kullanılması bebeğin motor gelişimine ve fonksiyonel kazanımlarına katıda bulunabilir. Bu çalışmada bebek ve çocukların tedavisinde kullanılabilecek kanıta dayalı motor öğrenme prensipleri hakkında literatür bilgisi sunulacak ve motor öğrenme prensiplerinin Nörogelişimsel Tedavi uygulamalarına nasıl entegre edilebileceği konusu tartışılacaktır.
Anahtar Kelimeler: Bobath, Motor Öğrenme, Nörogelişimsel Tedavi

Yoğun Bakımdan Taburculuğa Bobath / NDT

Dr. Öğr. Üyesi Duygu TÜRKER

Ülkemizde her yıl doğan yaklaşık 1.3 milyon bebekten, en az %10'nun, yani 130.000'inin düşük doğum tartılı preterm yenidoğanlar olduğu söylenebilir. Genel olarak düşük doğum tartılı yenidoğanların üçte ikisi pretermdir. Buna göre ülkemizde her yıl 85.000 preterm yenidoğan doğmaktadır. Yaşamı sürdürmek için uygun bakım verilmediği sürece preterm doğumlarda mortalite ve morbidite hızı yüksektir. Yenidoğan Yoğun Bakım Ünite (YYBÜ)'lerinde son yıllarda görülen gelişmelerle birlikte preterm bebeklerde mortalite azalmıştır. Günümüzde 32 hafta altı doğan prematüre bebeklerin %85'i yaşatılabilmektedir. Bununla birlikte bu bebeklerin %50'sinde motor problemler, harekette inkoordinasyon, kognitif bozukluk, dikkat defisitleri veya gelişimsel problemleri içeren nörogelişimsel bozukluklar gelişme riski taşımaktadır. Oluşabilecek bozuklukların ve aktivite limitasyonlarının engellenmesi ya da minimalize edilmesi için YYBÜ'de yenidoğanlara fizyoterapi açısından uygulanacak değerlendirmeler ve bu doğrultuda hazırlanacak fizyoterapi programları oldukça önemlidir.
YYBÜ'de fizyoterapi uygulamalarının temeli "Dinamik Sistemler Teorisine" dayanmaktadır. Yeni doğanın biyolojik oluşumları (fizyolojik, fiziksel, psikososyal unsurlar), fiziksel ve sosyokültürel çevresi (hareket ve postural kontrolün geliştiği çevre) ile yeni doğana bakım verilen çevre ve sağlık profesyoneli (fizyoloji, davranış, postür ve hareketin değerlendirilmesi itibariyle) tedaviyi etkilemektedir. YYBÜ'de gerçekleştirilen tedaviler arasında sensorimotor gelişimi normalize etmeyi veya geliştirmeyi amaçlayan ve fizyoterapi yöntemlerinin de temelini oluşturan Nörogelişimsel tedavi (NGT) yaklaşımının en etkili yöntem olduğu vurgulanmıştır. Bireyselleştirilmiş tedavi programını içeren NGT bebekte temel olarak sakin durum ve motor organizasyonunun fasilitasyonu, pozisyonlama ve tutuş teknikleri ile düzgün dizilim ve normal tonus ile açığa çıkan fonksiyonel aktiviteleri içermektedir. Çevresel koşullar optimalize edilerek bebeğin motor öğrenmesinin kolaylaştırılması, çocuğun yapabileceği hareketleri kolaylaştırmak, fonksiyonlarının bağımsızlığını sağlamak, çocuk-aile gereksinimine göre günlük yaşamı şekillendirmek NGT uygulamalarının esasıdır.

Gelişim Teorileri ve Bobath / NDT

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Gelişim kavramı içerisinde büyüme ve olgunlaşma parametrelerini bulunduran geniş bir kavramdır. Büyüme genel olarak fiziksel yapıların boyutlarındaki artışı ifade ederken; olgunlaşma büyümenin işlevselliği, kognitif fonksiyonlar, motor öğrenme yeteneği ve öğrenilen bilgilerin uygun kullanımı, aktivite, katılım, fonksiyonellik gibi daha geniş bir kapsamı teşkil eder. Gelişim sürecinde, bütünleşme vardır, çünkü fiziksel, sosyal ya da bilişsel bir gelişim alanı, bir diğerine bağlı olup, birinde gerçekleşen değişiklik diğer alanlarını da etkilemektedir. Bobath/Nörogelişemsel Tedavi-NDT yaklaşımı; Bertha ve Karel Bobath'ın çalışmaları sonucu ortaya çıkmıştır. Bobath yaklaşımı çocukların normal motor ve duyusal gelişimlerine dayandırılmış olup günümüzde çocuğun yaşadığı deneyimler ve öğrenme süreci ile birlikte motor ve duyusal gelişimin dinamik, değişen ve gelişen yapısı göz önüne alınarak dinamik bir terapiyi benimsemektedir. Bobath yaklaşımında, özellikle Serebral Palsi riski altındaki bebeklerde "*Nörogelişimsel kavramı"* ise gelişmenin alt parametreleri olan büyüme ve olgunlaşmayı da içine alacak şekilde geniş bir kapsam çizmekte ve bütüncül bir bakış açısı ortaya koymaktadır. Gelişim teorileri kapsamında özellikle motor kontrol teorileri fizyoterapi yaklaşımlarıyla kuvvetli bir ilişki sergileye gelmiştir. Genel olarak "The Neural – Maturationist Theories" (Nöral Matürasyon Teorileri), Dinamik Sistemler Teorisi, "Neuronal Group Selection Theory" (Nöronal Grup Seleksiyon Teorisi) olmak üzere 3 başlık altında incelenebilecek bu teorilerden Nöral Matürasyon Teorileri motor kontrolün merkezi sinir sistemindeki gelişmeye bağlı olarak eş zamanlı ilerlediğini ve bu ilerleyişin kodlanmış şekilde merkezi sinir sisteminde mevcut olduğunu bildirmektedir. Serebral, serebellar matürasyon ve serebral gelişimin spinal veya daha alt seviyedeki nöral merkezler üzerindeki kontrolün artması ile motor kontrol, lokomotor hareketler ve selektif hareketlerin ortaya çıktığı belirtilmektedir. Dinamik Sistemler Teorisinde ise vurgu motor kontrolün bir çok farklı sistemin bir araya gelerek, ortak ve eş zamanlı çalışması ile oluştuğu üzerindedir ve çocuğun yaşadığı tecrübeler ve çevresel etmenlerin motor kontrol üzerindeki etkileri bu teori ile ortaya konmuştur. Nöronal Grup Seleksiyon Teorisin de ise gelişimdeki hedefe yönelik kalite, varyasyon ve yetenek oluşumuna kadar giden birçok çerçeve tanımlanmaktadır. Günümüzde terapiler gelişim teorilerine paralellik gösterebileceği gibi ayrışmalarda yaşanabilmektedir. Bu konuşmada; Bobath'ın bebeklerde uygulanması göz önüne alınarak, özellikle motor gelişim teorileri üzerinden bir bakış verilecektir.

Daha normal bir postural kontrol kazanılması daha normal bir hareket paterninin gerçekleştirilmesi için gerekmektedir. Normale yakın bir hareket hissi en az eforla açığa çıkarılabilirse kişi bu hareketi nasıl yapacağını öğrenebilmektedir. Terapistin görevi, bir hareketin en az eforla ve normale en yakın şekilde yapılabilmesi için gerekli zemini hazırlamaktır.

Bertha ve Karel Bobath normal gelişim sırasında başlarda tonik reflekslerin etkili olduğunu daha sonra bunların baskılanıp yerini düzeltme reaksiyonlarına bıraktıklarını fark ettiler. Düzeltme reaksiyonları gelişip denge reaksiyonlarına ve istemli hareketlere dönüşüyordu. Bu bilgi daha dinamik bir tedavinin kapılarını aralamıştır. Bu anlayışla tedavi esnasında, düzeltme reaksiyonları, denge reaksiyonları, destek reaksiyonları ve diğer otomatik reaksiyonlar fasilite edilmektedir.

Normal postural reaksiyonlar, bütün istemli hareketlerin temelini oluşturmaktadır. Postural reaksiyonların neler olduğunu ve nasıl geliştiğini anlamak için normal gelişim basamaklarını dikkatlice incelemek gerekmektedir. Bir bebek güçlü bir fleksör aktivite ile dünyaya gelir. Gövdenin fleksör aktivitesinin yanında alt ekstremitelerde de addüksiyon ve fleksiyon hakimdir. Hem yüzüstü hem sırtüstü pozisyonda dereceli olarak gövdenin ekstansiyonuyla birlikte ekstremitelerin de abdüksiyonu kazanılır. Yüzüstü pozisyonda baş kontrolü hızla gelişir aynı dönemde oturmaya çekildiğinde başı geride kalmaz ve başını yer çekimine karşı düzeltebilir. 3 aylık olduğunda önkolları ile gövdesini destekler ve bağımsız baş hareketleri ile etrafını gözlemler. Yine bu dönemde orta hat oryantasyonu kazanır, ellerini gözlemler onlarla oynar ve kavrar. 4-8 ay arasında ekstansiyon gittikçe gelişir. Yüzüstü pozisyonda dirsekler tam ekstansiyondayken gövde desteklenebilir. 4 aylık bir bebek göğüs kafesinden desteklenip havada yüzüstü tutulduğunda (Landau Reaksiyonu) önce başını ve gövdesini sonra da alt ekstremitelerini ekstansiyona getirir. Bu reaksiyon ayağa kalmak için önemli ve gerekli olan bir hazırlıktır. Bebek 8 aylık olduğunda düz bir şekilde oturabilir ve oturmada ellerle önden ve yanlardan destek alabilir. Gelişim sırasında önce önden destek alma gelişir (koruyucu reaksiyonlar). Daha sonra sırasıyla yanlardan ve arkadan destek almak gelişir. Yine bu dönemde yüzüstünden sırtüstüne, sırtüstünden yüzüstüne dönebilir. Gövde rotasyonu ve kol desteği ile sırtüstü pozisyondan oturmaya geçebildiği gibi oturma pozisyonunda ayağa kalkmayı da başarabilir. 8 aya kadar graviteye karşı bebeğin geliştirdiği postural tonus **"düzeltme reaksiyonları**" olarak adlandırılır. Bebek bu dönemde henüz dengesini sürdürmekte veya dengesi bozulduğunda onu yeniden kazanmakta başarılı değildir. Düzeltme reaksiyonları, başın gövdeye göre normal pozisyonunu sürdürmesini sağlar. Vücut hareket ettiğinde yüz vertikal, ağız ise horizontal pozisyonunu korur, baş hareket ettiğinde ise vücut başı takip ederek normal dizilimi geri kazanır. Dönerken veya oturma pozisyonuna geçerken baş otomatik olarak normal pozisyonuna gelir. Düzeltme reaksiyonları aynı zamanda ekstremitelerin gövdeye, gövdenin ekstremitelere göre normal pozisyonunu sağlamasını da etkiler. Dönerken, oturmaya geçerken, ayaktayken veya yürürken toraks pelvisi ve pelvis toraksı takip eder. Ortalama 7-8

aylıkken bebek yer çekimine karşı aktivitesini sürdürürken ilk **"denge reaksiyonları"** açığa çıkar. Aslında denge reaksiyonları ve düzeltme reaksiyonları birbiri ile ilişkilidirler ve kesin sınırlarla birbirlerinden ayrılamazlar. Birinin bittiği yerde diğerinin başladığını söylemek mümkün değildir. Denge reaksiyonları yer çekimi merkezindeki değişimlere karşı, dengeyi yeniden sağlamak için geliştirilmiş otomatik kompansatuar hareketlerdir. Gravite merkezindeki hafif değişimler denge reaksiyonlarının açığa çıkmasına neden olmasa da postural tonusta görünmez değişikliklere neden olur. Bu tonus değişiklikleri, büyük pertürbasyonlarda açığa çıkan kompansatuar hareketlerde olduğu gibi iyi koordine edilmiş paternler halinde açığa çıkar. Bu otomatik postural reaksiyonlar, istemli fonksiyonel aktivitenin de altında yatan hareket mekanizmalarıdır. Merkezi sinir sistemi gelişirken bu reaksiyonlarda oluşacak gecikme veya anormallik fonksiyonel aktivitenin de düzgün bir şekilde yapılmasına engel olacaktır.
Anahtar Noktaların Kontrolü: Bertha Bobath, vücudun anahtar noktalar olarak adlandırılan proksimal parçaları (baş, omuzlar, pelvis) kullanılarak anormal paternlerin kontrol edilebileceğini, kuvvetin ve postural tonusun dağılımının değiştirilebileceğini ve normal hareket paternlerinin fasilite edilebileceğini fark etmiştir. Anahtar noktaların kontrolü ile terapist amaca yönelik harekete daha aktif katılım sağlamaya çalışır. Aktiviteyi daha yapılabilir, güvenli ve eğlenceli hale getirmek de tedavi hedefleri arasındadır.

Gelişimsel Pediatrist Gözüyle Riskli Bebek

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Gelişim, intrauterin dönemde nörogenez, migrasyon, nöronal diferansiyasyon ve sinaptogenez ile başlayan ve sinaptik olgunlaşma, gliyagenez, miyelinizasyon ile devam eden ve nörotransmitter sistem ve apopitoz da içeren süreçlerde ortaya çıkan, başlıca motor, iletişim, bilişsel ve sosyal duygusal alanlarda artan işlevselliktir. Genetik ve çevresel faktörler ile belirlenir. Risk ise önceden alınacak önlemler ile önlenebilecek içten (genetik) veya dıştan (çevresel) kaynaklanan nedenler ile oluşabilecek hasar, yaralanma, engellilik, kayıp veya herhangi başka bir olumsuz durumun oluşma ihtimali veya tehdittir. Riskler yaşamın farklı evrelerinde ortaya çıkabilir, süresi ve şiddeti farklılık gösterebilir. Risklerin yanında çocuk ve ailenin dayanıklılık (güçlü yönleri) faktörleri de belirlenmeli ve ortaya çıkarılmalıdır. Günümüzde gelişmiş ülkelerde çocukların %10-20'sinde nörogelişimsel bir sorun olduğu, gelişmekte olan ülkelerde ise 250 milyon çocuğun doğuştan getirdiği gelişimsel potansiyeli gerçekleştiremediği belirtilmektedir. Bu sayılar ülkeler için önemli bir hastalık yükü oluşturmaktadır. "Riskli bebek" tanımı günümüzde yaygın olarak "gebelik, doğum sırasında ya da doğum sonrasında yaşanan sorunlara bağlı olarak gelişme geriliği, sensörinöral problemler, dil geriliği, davranışsal sorunlar ve psikososyal problemlerin görülmesi açısından risk altındaki bebekler" olarak tanımlanmaktadır. Prematüre, düşük doğum ağırlıklı ve hipoksik doğan bebekler başta olmak üzere "riskli bebek" tanımı içinde olan bu bebeklerin gelişimsel gerilik riski diğer bebeklere göre yüksektir. Bununla birlikte 2018 yılında DSÖ ve UNICEF işbirliği ile yayınlanan erken çocukluk gelişimini desteklemek amacıyla yayınlanan raporda gelişim için gereklilikler, sağlık, beslenme, güvenli ve güvenilir çevre, duyarlı anne/babalık ve erken öğrenme/eğitim olanakları başlıkları altında sınıflanmıştır. Bu konuşmada belirtilen başlıklar içinde "riskli bebek" tartışılacaktır.

GMs Bobath / NDT Uygulamalarına Yön Verir mi?

Aysu Kahraman

General movements (GMs) tüm vücudu içine alan, karmaşık, akıcı ve değişken hızdaki hareketlerdir. Postmenstrual 9. haftada başlar ve postterm 5. aya kadar devam eder. Central Patern Generator'ler tarafından oluşturulur. GMs erken dönemde beyin hasarı ve disfonksiyonunu belirlemenin mükemmel bir yoludur.
GMs kalitesinin değerlendirilmesinde Prechtl metodu objektif, geçerli ve güvenilir bir yöntemdir. Yönteme göre; preterm (28 – 36/38 hafta) ve writhing (36/38 – 48 hafta) dönemde bebek normal GMs, Poor Repertoire (PR) GMs, Cramped Synchronized (CS) GMs, Chaotic (CH) GMs ve hypokinesis (H) GMs gösterebilir. Fidgety (49 – 55/58 hafta) dönemde ise fidgety hareketin olması (F+), olmaması (F-) ve anormal olması (AF) şeklinde değerlendirme yapılır. Bebeklerin longitudinal olarak takibi nörolojik durumu belirleyebilmek açısından önemlidir.
PR GMs gösteren bir bebekte süreç içerisinde normal gelişim görülebileceği gibi minör nörolojik bozukluk veya tüm tiplerde serebral palsi (SP) de gelişebilir. PR hareketle birlikte postterm 2 aya kadar daire şeklinde kol hareketleri ve gergin parmak görüntüsü olması, daha sonra orta hatta doğru kol ve bacak hareketlerinin olmaması ve F- diskinetik SP'nin belirtisidir.
CS GMs görülen bebekte ilerleyen aşamalarda F+ olması normal gelişim olacağını gösterirken, CS hareketin ısrarlı olarak görülmesi ve F- spastik SP'nin belirtisidir.
Ch GMs görülen bebekte bir süre sonra CS GMs görülür ve bu bebeğin spastik SP olacağının göstergesidir.

Genellikle H GMs görülen bebeklerde ısrarlı asimetrik tonik boyun refleksi ve opistotonusun da görülmesi ile hipotonik SP gelişebilir.
F+ normal gelişimi gösterirken, F- tüm SP tiplerinin ortak özelliğidir. AF'nin tahmin değeri düşüktür. Bu bebekler normal gelişim gösterebileceği gibi nörolojik bir disfonksiyonda gösterebilir.

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Clinical Assessment of Feeding Problems in Neonates, Infants and Children

Feeding is the primary occupation of infancy. Feeding problems can lead to negative experiences, which van affect nutrition, developmental outcome, parent interaction and social adaptation. Babies and children with neurodevelopmental problems are even more at risk for feeding problems and dysphagia resulting in decreased oral intake and aspiration resulting in chest infections.
Feeding is a common focus of early intervention. During the first session we will focus on the process of identification and assessment of feeding and swallowing problems in neonates, infants and young children. We present you a selection of internationally available observations and clinical assessments for the pediatric population dealing with feeding problems.

Oral feeding Interventions in Neonates, Infants and Children

Neonates, infants and children with complex neurodisabilities require an interprofessional "whole system" approach. The main approaches for supporting oral feeding in sick neonates and infants and children with complex neurodisabilities (such as C.P.) will be discussed. We like to give you an insight in an infant driven approach based on the principles of clinical reasoning which minimizes the risk for aspiration and improves the quality and quantity of the oral intake in order to optimizes nutrition and hydratation.

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Bobath / NDT Yaklaşımı, Erken Dönemde Duyusal Sistemleri Nasıl Etkiler?

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Serebral Palsi (CP)'nin rehabilitasyonu bilimsel fakat uzun bir süreçtir. Bu süreç, çocuğun yaşına, CP'nin seyrine, çocuğun etkilenme oranına ve eşlik eden diğer problemlere göre değişiklik gösterebilmektedir. Bir tedavi yönteminin bilimsel olarak kabul edilebilmesi için üzerinde bilimsel çalışmalar planlanması ve karşılaştırmalı olarak net sonuçların ortaya konması gerekir.

Serebral Palsi'li çocuğun motor probleminin yanı sıra eşlik eden pek çok sorununun varlığı tedavide daha bütüncül bir yaklaşım ihtiyacı konusuna dikkat çekmektedir !

NÖROGELİŞİMSEL TERAPİ (BOBATH) : Günümüzde tüm dünyada fizyoterapistler tarafından en sık kullanılan yaklaşım olduğu bilinmektedir. Nörogelişimsel Terapi (BOBATH) bay ve bayan Bobath'lar tarafından CP'li çocuktaki merkezi sinir sistemindeki bozukluklar sebebiyle normal motor gelişim- postüral kontrol ve reflekslerdeki hatalar yüzünden oluşan anormalliklerin üzerine kurulmuştur. Günümüzde İsviçreden Dr Elsbeth Köng ve fizyoterapist Mary Quinton tarafından özellikle motor kontrol ve motor öğrenme kuramlarındaki güncel gelişmeler ışığında Bobath yaklaşımındaki tekniklerin zenginleştirilmesi konusunda çalışmalar alana dahil olmakta ve dünyanın pek çok ülkesinde bu alanda çalışan Bobath terapistleri ile düzenli olarak deneyim ve bilgi alışverişi devam etmektedir. Bobath'lara göre CP deki motor problemin temelini, normal motor gelişimi engelleyen, yerçekimine karşı normal postüral kontroldeki gelişimi etkileyen santral sinir sistemindeki fonksiyon bozukluğuydu.

Bobath yaklaşımı, CP'li çocuktaki merkezi sinir sistemindeki bozukluklar sebebiyle normal motor gelişim-postüral kontrol ve reflekslerdeki hatalar yüzünden oluşan anormalliklerin üzerine kurulmuştur. CP'li çocuklar ısrarcı bozuk postür ve kalıplaşmış yanlış hareketlere eğilimli olduklarından kontraktürler ve deformitelerin gelişme riski yüksek olan çocuklardır. Müdahale edilmezse çocukta kas kontraktürleri, yumuşak doku ve eklem deformiteleri gelişebilir. Bu kontraktürler ve deformiteler hareketleri çok zorlaştırır ve sonuç olarak uzun dönemde motor becerilerde azalmaya sebep olur. Normal motor gelişim ve fonksiyonunun belirlenmesi, kontraktür ve deformitelerin önlenmesi bu yaklaşımda oldukça önemlidir. Bu yaklaşım kas tonusu, duyu motor komponentleri, refleksler ve anormal hareket paternleri, postüral kontrol ile duyu, algı ve hafıza üzerine odaklanır. Bobath terapisinde esas amaç, merkezi sinir sisteminin nöral tabanlı motor sorumluluğunu değiştirmektir.
Nörogelişimsel Terapi/ Bobath prensiplerine göre yapılan klinik değerlendirmeler, motor gelişimin ve hareket kalitesinin yanısıra çocuğun farklı alanlardaki problemlerini de belirleyerek ana problemi bulmaya ve tedavide ana problemden yola çıkarak eşlik eden problemlere de etki etmeyi hedefler.
Bobath konseptine göre değerlendirme, tedavi prensiplerini belirlemeden önce en önemli bölümü kapsar. İyi bir değerlendirme ile çocuğun ana problemi belirlenir ve eşlik eden sorunlar da göz önünde bulundurularak terapi programına karar verilir. Değerlendirmede çocuğun hareketlerinin yaşa uygunluğu, tipi ve kalitesi, hareketler sırasında denge ve koordinasyonu, kas tonusu, postürü, duyusal sorunları, genel olarak çocuğun hareketi nasıl yaptığı ve bozukluğun nereden kaynaklandığı analiz edilir ve ihtiyaçlar belirlenir. Gelişebilecek ikincil sorunları önleyebilmek için yardımcı gereçler, ortez, pozisyonlamaya yardımcı cihazlar belirlenir. Tüm bu süreçte çocuk bütün olarak ele alınır ve farklı disiplinlerle iş birliği içinde çalışılır. Aileler de bu sürece çocuğa evde uygulanacak pozisyonlama ve egzersizleri öğrenerek aktif olarak katılırlar.
CP'li çocuklarda gelişimin birçok alanında (bilişsel, dilsel, dikkat, ve duyusal işlemleme yeteneği gibi) eksiklikler vardır (Hardy 1983; O'Malley ve Griffith1977; Moore 1984). Anormal hareketinin duyusal gelişim üzerindeki etkisi bilinmesine rağmen CP tedavisinde öncelikle hareket bozukluklarına odaklanılır. Motor öğrenme teorilerindeki son gelişmeler, hareketi gerçekleştirmede duyusal geri bildirimin rolünü daha detaylı olarak açıklamaktadır. Buna ek olarak, motor öğrenme teorisi motor hareketin üretiminde motivasyonun ve çevrenin önemini de vurgular (Heriza 1991).
Unutulmaması gereken nokta; CP nin öncelikle postür ve hareket bozukluğuna yol açtığı ve yanı sıra eşlik eden sorunları da beraberinde getirdiği için bir ekip çalışmasını gerektirdiğidir. Bu ekipte Pediatrik nörolog, ortopedist, göz hekimi ve gerekli durumlarda ilgili branş hekimleri, Fizyoterapist, Ergoterapist, Dil ve Konuşma bozuklukları uzmanı, Psikolog, Çocuk Gelişimi ve eğitimi uzmanı, özel eğitimci ve ilgili alandaki tün profesyoneller gerekli durumlarda yer alır. Aile ve çocuk ekibin en önemli parçasıdır.
SEREBRAL PALSİ'NİN TİPİNE GÖRE FİZYOTERAPİ YAKLAŞIMLARI DEĞİŞİKLİKLER GEREKTİRİR !
Nörofizyoloji alanındaki gelişmelere paralel olarak Serebral Palsi için Bobath terapisi yaklaşımı da yıllar içinde evrilmiş ve geliştirilerek klinik uygulamalarda kullanılır hale gelmiştir. Bu nedenle çocuğun hareket bozukluğunun tipine, fizyoterapistin değerlendirme bulgularına göre tedavi şekli değişebilir. Duyu değerlendirmesi yapılandırılmış bir ortamda değil çocuğun günlük yaşamında oyun oynarken, beslenirken, giyinip soyunurken yapılır. Tüm günlük yaşam içerisindeki gözlem sırasında elde edilen bilgiler ile terapi esnasında seçilecek anahtar noktalar çocuğun proprioseptif girdiyi daha net olarak hissedebileceği bölgelerden seçilir. Duyusal uyaranların tonusu etkileyeceği göz önünde bulundurularak öncelikle tonusu regüle edip sonra duyuları çalışmak, gerekli durumlarda farklı zeminlerde, farklı şiddetteki uyaranlarla, fasilitasyonun hızı, yönü, ritmi ayarlanarak, çocuğun aktif katılımı sağlanmaya çalışılır. Uygun yapılandırılmış ortamda uygun seçilmiş uyaranlar ile CP'li çocuğa verilecek normale yakın sensori motor deneyim motor öğrenme için temel teşkil eder
ERKEN DÖNEMDE VERİLEN NORMALE YAKIN SENSORİMOTOR DENEYİM HENÜZ PATOLOJİK PATERNLERİ YERLEŞMEMİŞ CP'Lİ ÇOCUĞUN VÜCUT FARKINDALIĞI VE HAREKET GELİŞİMİNİ OLUMLU YÖNDE ETKİLER
'' Ne kadar hareket o kadar duyu ; Ne kadar duyu o kadar hareket '' Berta BOBATH

Anne - Bebek İlişkisi

Doç. Dr. Dilşad Foto Özdemir

Hacettepe Üniversitesi Tıp Fakültesi Çocuk ve Ergen Ruh Sağlığı ve Hastalıkları AD.

Anababaların bebeklerini nasıl algıladıkları, yorumladıkları ve yaşadıkları (tasarımları), bebeğin gelişimi ve uyumu açısından çok önemlidir. Bu algıyı etkileyen süreçler gebelikte hatta gebelikten çok daha önce başlamaktadır. Gebelik süreci ilerledikçe annebabanın zihinlerinde bebekle ilgili fanteziler, rüyalar, kaygılar, idealler belirginleşmeye başlar. "İmge bebek" denilen bu tasarımların nasıl algılandığını belirleyen unsurlar arasında hayaller, beklentiler, fanteziler, kaygılar , umutlar, korkular, kendi "bebeklik ve çocukluk ilişkileri ve deneyimleri", aile gelenekleri, mitleri, önemli yaşam deneyimleri, yaşam zorlukları, plansız bir gebelik olması ya da bu süreçte önemli bir hastalığın tespit edilmesi gibi etmenler sayılabilir. Gebelikte, doğum sırasında ya da doğum sonrası erken

dönemde belirgin sorunlar, gelişimsel farklılıklar yaşayan bebekler annebabanın imge bebeklerini kaybetmelerine, hayallerindeki bebeğin yasını tutmaya başlamalarına, bebeğin mizacını olumsuz algılamalarına neden olmakta, gebelik sonrası dönemde depresyon ve güvensiz bağlanmaya yol açmaktadır. Anne-bebek etkileşiminin niteliğini olumsuz etkileyen bu süreçlerde bebeklerde daha zor yatışma, huzursuzluk, çok ağlama, emme, uyku, barsak işlevleriyle ilgili sorunlar gelişmekte, dolayısıyla annede yetersizlik duygularının oluşmasına, negatif bir anne-bebek ilişkisinin doğmasına neden olmaktadır. Bebekteki tıbbi sorunların ciddiyetine göre ebeveynlerde öfke, suçluluk, utanç duyguları, kaygı, depresyon, benlik saygısı ve kendine güvende azalma, travma sonrası stres bozukluğu belirtileri görülmektedir. Ebeveynlerin kontrolü dışında gelişen bu süreçler ebeveyn kaygı düzeyini arttırmakta, kaybetme endişesi yaşamalarına, bebeğin tıbbi tedavisi sürerken yas tutma süreçlerinin başlamasına neden olmaktadır. Bu durum annelerin bebeklerinden gelen duygusal ipuçlarına daha az hassas olmalarına, bebeğin ihtiyaçlarını anlayamamalarına, daha kontrolcü olmalarına neden olmaktadır. Annenin bebeğine mekanik bir bakım vermesine, yüz yüze iletişimlerinin az olmasına, bebeğin işaretlerine verdikleri yanıtların gecikmeli, uygunsuz olmasına neden olmaktadır. Erken dönem ebeveynle olan deneyimlerin beynin nöroplastisine etkisi göz önünde bulundurulduğunda anne-bebek ilişkisini güçlendirmeye yönelik müdahaleler oldukça önemli görülmektedir.

Klinikten Vaka Çözümlemeleri

Filiz Sayal

Vaka sunumu
*Adı Soyadı: A.O
*Hikayesi:32 haftalık preterm doğum/hidrosefali+intrakranial kanama/triplejik CP açısından riskli bebek
*İlk değerlendirme ve sonraki takipleri (normal gelişime göre nasıl olmalı?/ Bebek neler yapıyor neler yapamıyor? Neden)
*Problem analizi (Hareket analizi ve hareket komponenetlerinin mekaniği ile ilgili klinik akıl yürütme süreci)
* Ana problemin belirlenmesi(Çocuk neyi nasıl yapıyor?/Neden?/Ana problem ne?)
*Tedavinin planlanması(Ana probleme yönelik neler yapılmalı?Nasıl başlanmalı?/ Neden?)
* Tedavi videosu(Fasilitasyon,handling ve pozisyonlama ile hareketin kalitesi nasıl değişti?/Neden?)
*Bobath 'tan önce ve Bobath'tan sonra mesleki anlamda neler değişti?(Çocuğa bakış açısındaki değişiklikler neler?/Terapiden alınan keyif ve motivasyon nasıl değişti?/Terapideki verim nasıl değişti?)

ERKEN ÇOCUKLUK DÖNEMİNDE FONKSİYONEL SINIFLAMA SİSTEMLERİ

Doç Dr Gönül ACAR

Sınıflama, klinisyenlere ve araştırmacılara patolojiyi tanımlama hasta hakkında ortak bir anlayış sağladığı gibi klinik pratikte tanıyı yapan kişiler arasında etkili ve verimli bir iletişim sağlar ve tedaviyi yönetecek fizyoterapistleri/terapistleri bilgilendirir.
Sınıflama ile erken çocukluk döneminde olan bir bozukluğun; farklı bileşenleri, semptomları ve seviyeleri tanımlanarak, risk faktörleri, bozukluğun mekanizmalarını ve müdahalenin etkinliği ile ilgili kanıtları belirlenebilir. Erken çocukluk döneminde Doğum kilosuna göre sınıflamaya göre 2500 gram altı çocuklar düşük doğum tartılı, 1500 gram altı çocuklar çok düşük doğum tartılı, 1000 gramın altı olan çocuklar aşırı düşük doğum tartılı olarak tanımlanır. Gestasyon yaşına göre küçük olma SGA (Small for gestational age):10. Persantilden düşük olma durumunu, Gestasyonel yaşına uygun olma, AGA(Appropriate for gestational age) 10- 90. persantil arasında olma durumunu, gestasyonel yaşına göre daha iri olma LGA (Large for gestational age) doğum kilosunun 90. persantilden büyük olması olarak tanımlanır. Prematüre : < 37 6/7 Gestasyon haftasında doğan, Full term : > 38 hafta-42 Gestasyon haftasında doğan,
Postmatüre (postterm) :ise > 42 gestasyon haftasında doğan bebeği tanımlamak için kullanılır.
Serebral Palsi'nin (SP)yeni tanımlanması ile alt grup ağacı a) Spastik alt grubunda Spastik Bilateral, Spastik Uniateral, Diskinetik alt grubunda distonik, koreoatetoid, ataksik alt grubunda yine ataksik tip SP bulunmakta ve komponentleri aşağıdaki gibi tanımlanmaktadır.
1- Motor Bozukluk: a)Doğası ve tipoloji, b)fonksiyonel motor beceri
2- Eşlik eden sorunlar
3- Anatomik ve radyolojik bulgular
a) Anatomik tutulum:. Beyinde hasar olan bölgeyi
b) Radyolojik bulgu: Görüntüleme yöntemlerinden elde edilen radyolojik bılguları
4- Hasarın oluşma zamanı: Beyin hasarının oluşma zamanını (prenatal, postnatal yada perinatal) sınıflar. International Classification of Functioning, Disability and Health (ICF)(Disabilite, sağlık ve fonksiyonun uluslararası sınıflaması), sağlık ve sağlıkla ilgili durumların tanımı için çerçeve sunar, karmaşık koşullara sahip çocukların

yapılarının değerlendirmesi için bireye özgü bütüncül yaklaşımdır. International classification of functioning, disability and health: children & youth version: ICF-CY, 2007 yılında Dünya sağlık örgütü tarafından yayınlanmıştır. Yapı ve fonksiyon: sistemlerinin fizyolojik yapısını, aktivite: tüm vücut aktiviteleri ve görevi, katılım: yaşamın içinde yer almayı ve oyuna katılımı ifade eder.

SEREBRAL PALSİ SINIFLAMA SİSTEMLERİ

GMFCS (Kaba Motor Fonksiyon Sınıflandırma Sistemi) genişletilmiş ve yeniden düzenlenmiş şekline göre,

Seviye I: kısıtlama olmaksızın yürür.
Seviye II: kısıtlamalarla yürür.
Seviye III: elle tutulan hareketlilik araçlarını kullanarak yürür.
Seviye IV: kendi kendine hareket sınırlanmıştır. Motorlu hareketlilik aracını kullanabilir.
Seviye V: Elle itilen bir tekerlekli sandalyede taşınır.

GMFCS Kaba Motor Fonksiyon Sınıflandırma Sisteminin İkinci doğum gününden önce olan kısmına göre

Seviye I: Bebekler oturma pozisyonu alabilir ve bozabilir, her iki eli nesneleri hareket ettirmek üzere serbestken yerde oturur. Bebekler elleri ve dizleri üzerinde emeklerler, kendilerini çekerek ayağa kalkarlar ve mobilyaya tutunarak adım atarlar. Bebekler 18 ay -2 yaş arasında herhangi bir yardımcı hareketlilik aracına ihtiyaç olmaksızın yürürler.

Seviye II: Bebekler yerde oturmayı sürdürebilirler. Fakat dengeyi korumak için ellerini destek olarak kullanmaya ihtiyaç duyabilirler. Bebekler, karnı üzerinde sürünür ya da elleri ve dizleri üzerinde emeklerler. Bebekler kendini çekerek kalkabilir ve mobilyadan tutunarak adım atabilirler.

Seviye III: Bebekler alt gövdeden desteklendiğinde yerde oturmayı sürdürebilirler. Bebekler, dönebilir ve karnı üzerinde öne doğru sürünebilirler.

Seviye IV: Bebeklerin baş kontrolü vardır. Fakat yerde otururken gövde desteğine gereksinim duyarlar. Bebekler sırtüstü ve yüzüstü dönebilirler.

Seviye V: Fiziksel yetersizlikler istemli hareket kontrolünü kısıtlar. Bebekler yüzüstü ve oturmada baş ve gövde duruşunu yer çekimine karşı koruyamazlar. Bebekler, dönmek için bir yetişkinin yardımına ihtiyaç duyarlar

Mini-Manual Ability Classification System (SP'li Çocuklarda Mini-El Becerileri Sınıflandırma Sistemi): Bir–4 yaş arasında SP'li çocukların el fonksiyonlarını sınıflamak için kullanılır.

Bimanuel ince motor fonksiyon sınıflaması (Bimanual Fine Motor Function: BFMF) çocuklarda her iki eli birlikte değerlendirir.

Seviye 1: El kısıtlama olmaksızın kullanır. Diğer el kısıtlı kullanır veya daha ileri ince motor becerilerde limitasyon.

Seviye 2 : a) Bir el kısıtlama olmaksızın kullanılır. Diğer el sadece kavrama ve tutma yeteneği b) Her iki el daha ileri ince motor becerilerde limitasyon.

Seviye 3: a) Bir el kısıtlama olmaksızın kullanır. Diğer el fonksiyonel yetenek yok
b) Bir el daha ileri ince motor beceriler de limitasyon. Diğer el sadece kavrama yeteneği veya daha kötü.

Seviye 4: a) Her iki el sadece kavrama yeteneği, b) Bir el sadece tutma yeteneği, diğer en yalnızca tutma yeteneği veya daha kötü.

Seviye 5: Her iki el sadece tutma yeteneği veya daha kötü olarak tanımlanır.

Communication Function Classification System (CFCS)(SP li bireyler için iletişim fonksiyon sınıflama sistemi(İFSS) SP'li çocukların iletişimi yine 1den 5 'e kadar seviyelendirir.

Eating and Drinking Ability Classification System for Individuals with Cerebral Palsy (EDACS) sınıflama sistemi seviyeleri;

Seviye I. Güvenli ve etkili yer, içer
Seviye II. Güvenli yer, içer ancak etkili yemesinde bazı limitasyonlar vardır.
Seviye III. Yeme içmenin güvenli olmasında bazı limitasyonlar var.
Seviye IV. Yeme ve içmede belirgin kısıtlılık
Seviye V. Güvenli yeme içme yapamaz- tüp beslenmesi ile beslenir.

Fonksiyonel Mobilite Skalası (FMS)

FMS, Graham ve ark. tarafından SP'li çocuklarda ambulatuar performansı ölçmek amacıyla geliştilen çocukların ambulasyon yetenekleri göstermesi ve farklı destek cihazlarını kullanabilmelerinin de sınıflandığı tek fonksiyonel skaladır. Bir sonuç ölçütü olan FMS, ambulasyon yeteneğini sınıflandırmak için de yararlıdır. Beş, 50 ve 500 metre mesafeye yürümesi için gereken yardımı da (hiçbiri, baston, koltuk değneği, yürüteç, tekerlekli sandalye) sınıflandırır. Viking konuşma skalası, 2010 yılında SP'li çocuklarda konuşmayı seviyeli olarak sınıflar.

Seviye I. Konuşma, motor bozukluktan etkilenmez.
Seviye II. Konuşma kesin değildir ancak genellikle yabancı dinleyiciler için anlaşılabilir.
Seviye III. Konuşma belirsizdir ve genellikle bilinmeyen dinleyicilere bağlam dışında anlaşılabilir değildir.
Seviye IV. Anlaşılabilir bir konuşma yok olarak konuşmayı sınıflar. İlk 2 yaş içinde fonksiyonel sınıflamaların zorlukları, bebeğin büyümekte olması, riskler aynı bile olsa başka değişken bir çok faktörlerin bulunması, beyin anomalileri benzer olsa bile farklı klinik tablo ile karşımıza çıkması, tipik/atipik ayrımının zor olması, farklı kültür ve ırklarda bebek gelişiminde farklılıklar olması, gelişimde bazen farklı sıralama ve sınıflandırılamayan postüral paternlerin olması tüm bu zorluklar bebekleri sınıflamak yerine değerlendirmeye/ölçmeye yönlendirmektedir.

NÖROMOTOR DEĞERLENDİRME

Değerlendirme, hem tanıya hem de tedavinin tipine/yoğunluğuna/sıklık/ süresine yön verecek verilerin toplanması süreci olarak tanımlanır. Erken çocukluk döneminde değerlendirme, riskli grup bebeklerin erken tanınarak erken müdahaleye yönlendirilmesine katkıda bulunur.Risk olmayan grupta tipik/ atipik durumları tarama a macıyla kullanılabilir, bir terapi ya da erken müdahalenin yararı/ katkılarını gösterme , profesyoneller arası ortak dil sağlamanın yanında farklı ülke/ekip çalışmalarını karşılaştırmaya da imkan tanır. Genel Motor Değerlendirme(GMA) gibi bazı değerlendirmeler (çocukların farklı tanılar aldığı durumlarda örn: otizm, rett) geri dönüp yeniden analiz yapmak açısından avantaj sağlar. Son 5 yılın literatürlerini taradığımızda motor gelişimi değerlendirmek için en sık kullanılan testler aşağıdaki gibi sıralanmıştır.

Bayley Scales of Infant and Toddler Development®,3.Ed., (Bayley-III®)
Movement Assessment Battery for Children--Second Edition (MABC-2)
General Movements Assessment (GMs)
Alberta İnfant Motor Scale (AİMS)
Peabody Developmental Motor Scales, Second Edition
Bruininks-Oseretsky Test of Motor Proficiency--2nd edition (BOT-2)
Gross Motor Function Classification System (GMFCS)
Test Gross Motor Development
Developmental Coordination Disorder Questionnaire (DCDQ)

Motor gelişimi değerlendiren skalalar

Assessment of Fundamental Movement Skills
Vineland Adaptive Behavior Scale
Gross Motor Function Measurement – 88 (GMFM-88)
Assessment of Motor and Process Skills (AMPS)
The Physical Activity Research and Assessment tool for Garden Observation (PARAGON)
The Democritos Movement Screening Tool for Preschool Children (DEMOST-PRE©)
Developmental Assessment Scales for Indian Infants (DASII)
Movement Assessment of Infants
Test of Infant Motor Performance (TIMP)
Motor and Social Development (MSD) scale
Rapid Neurodevelopmental Assessment (RNDA)
Neonatal Behavioral Assessment Scale (NBAS)
The Motor-Proficiency-Test
İnfant Motor Profile (IMP)
Neurobehavioral Assessment of the Preterm Infant (NAPI)
Ability for Basic Movement Scale for Children Type T (ABMS-CT)

Eli değerlendiren skalalar

Asisting Hand Assessment (AHA)
Hand Assessment for Infants (HAI)
Children's Hand-Skills ability Questionnaire (CHSQ)

Uluslararası takımlar tarafından geliştirilen yeni rehbere göre: Görüntüleme teknikleri ile birlikte GM's analizinin kullanılması ile SP tanısı en erken aylarda konabilir. Klinik pratikte General Movements Assessment (GMs) takiben, TIMP, Bayley Scales of Infant and Toddler Development®, Third Edition, (Bayley-III®), Alberta İnfant Motor Scale (AİMS), Peabody Developmental Motor Scales, Second Edition (PDMS-2) testlerinin kullanılması ve eğer mümkünse birden fazla testin aynı bebek için uygulanıp karşılaştırılmasının yararlı olacağı vurgulanmıştır. General Movements Assessment (GMs) analizi SP'nin erken dönem tanısında ve daha sonra fidgety hareketlerin oluşup oluşmadığının takibinde kullanılırken, ilk 4 ayda TIMP (Test of motor performance) bebeklerde motor performansı ölçen geçerli ve güvenilir bir test olarak kullanılabilir. Bayley Scales of Infant and Toddler Development®, Third Edition, (Bayley-III®) 5 alanda kapsamlı olarak bebeği değerlendiren bir testtir. Alberta İnfant Motor Scale (AİMS) ise içinde pretem bebeklerin ve term bebeklerin bulunduğu 2200 sağlıklı bebeğin analizi ile Kanada'da geliştirilmiştir. Peabody Developmental Motor Scales, Second Edition (PDMS-2) ise bazı test malzemeleri kullanılarak bebeğin gelişimini kapsamlı olarak değerlendirir.

Testlerin karşılaştırılması ve birlikte kullanılması ile ilgili olarak yapılan " Preterm Bebeklerde Nöromotor Gelişimin Farklı Hareket Analizleri İle Değerlendirilmesi" adlı araştırmada 2500 gr altında doğan 61 bebek(4, 8 ve 12. ay) IMP, AIMS ve NSMDA ile değerlendirilerek tüm testler arasında uyumun iyi olduğu, IMP, NSMDA ve AIMS test bataryalarının prematüre bebeklerin nöromotor gelişimini ayrıntılı bir şekilde değerlendirdiği ve birbiri ile korele olarak kullanılabileceği vurgulanmıştır.

Erken dönemde bulgu vermemekle birlikte okul öncesi ve okul dönemindeki çocuklarda motor koordinasyon bozukluklarını tarayabilmesi açısından Developmental Coordination Disorder Questionnaire (DCDQ) (Gelişimsel Koordinasyon Bozukluğu Anketi) anne/baba tarafından doldurulan bir ankettir. Yıldırım C ve arkadaşları tarafından 5-15 yaş arası kullanılacak anketin Türkçe adaptasyon çalışması yapılmıştır. Okul öncesi döneme ait formuda şu anda bir ekip tarafından Türkçe'ye çevrilmektedir.

Özet olarak: Dünya sağlık örgütü hikayesinde risk olan bebeklerin yaşamın ilk yılı boyunca en az iki kez gelişimsel testlerle değerlendirilmesi gerektiğini vurgulamaktadır. Erken çocukluk döneminde bebeklerde değerlendirmelerin sistematik olarak yapılması, kaydedilmesi ve gerektiğinde tekrarlanması önerilmektedir. Birkaç Testin aynı bebeğe yapılarak aralıklarla tekrarlanması ile her alana ait doğru bilgilerin toplanması ve derlenerek, sentez edilmesi bebeklerin takibinde önemlidir. Bu test bataryalarından elde edilen sonuçlarla Riskli bebeklere verilecekerken tedavi yaklaşımının tipine, sıklığına ve yoğunluğuna karar vermek tercih edilmelidir. Ayrıca bebeklerin bu yaklaşımlardan yararlanma derecesinin ölçülmesi de ancak testlerin gelişimin kesme noktalarında uygulanması ile mümkündür.Bebeklik dönemi gelişimin devan ettiği bir dönem olduğu için bu dönemde sınıflanma sistemlerinin kullanılması daha zor bir süreçtir. Motor, sosyal, bilişsel, sosyal, dil, duyusal durum, bağlanma, oyun ve sosyal hayata katılımın sınıflanması ile ilgili yeni çalışmalara ihtiyaç duyulmaktadır.

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.SÖZEL BİLDİRİ LİSTESİ / Oral Presentations

No	Başlık	Title	Yazarlar / Authors	Sunucu Ad Soyad Presenter's name
S01	Serebral Palsi'li Çocuklarda Denge ve Solunum Kas Eğitiminin Fonksiyonel Kapasite, Denge, Solunum Fonksiyonları ve Solunum Kas Kuvvetine Etkileri	The Effects of Balance and Respiratory Muscle Training on Functional Capacity, Balance, Respiratory Function and Respiratory Muscle Strength in Children with Cerebral Palsy	Büşra KEPENEK-VAROL1, H. Nilgün GÜRSES1, Dilara Füsun İÇAĞASIOĞLU2	Büşra KEPENEK-VAROL
S02	Bobath (Nörogelişimsel Tedavi) Yaklaşımının Riskli Bebeklerin Annelerinin Memnuniyeti Ve Yaşam Kalitesi Üzerindeki Etkileri	Effects of neurodevelopmental therapy on the satisfaction and quality of life of mothers of risky babies	Duygu TÜRKER1, Duygu KORKEM2	DuyguTÜRKER
S03	Evaluation the motor repertoire in neurologically risk infants	Evaluation the motor repertoire in neurologically risk infants	Özge Çankaya, Kübra Seyhan, Ayşe Numanoğlu Akbaş, Mintaze Kerem Günel	Özge ÇANKAYA
S04	One deep way of learning "child, parent and therapist teamwork" in Bobath Concept.	One deep way of learning "child, parent and therapist teamwork" in Bobath Concept.	Antonietti L.(1), Holenweg Gross C.(2), Baruch Lara G.(3)	Antonietti L.
S05	Okul Öncesi Yaş Grubundaki Serebral Palsi'li Çocuklarda Türkçe Yaşam Alışkanlıkları Anketinin Geçerlik ve Güvenilirliği	Validity and Reliability of the Turkish Life Habits Questionnaire in Preschool Children with Cerebral Palsy	Merve Tunçdemir1, Sefa Üneş1, Kübra Seyhan1, Özge Çankaya1, Cemil Özal1, Ayşe Numanoğlu Akbaş2, Umut Ece Arslan3, Hilal Özcebe4, Mintaze Kerem Günel1	Merve TUNÇDEMİR
S06	Riskli Bebeklerde Demografik ve Klinik Özelliklere Göre Motor Profil Analizi	Motor Profile Analysis according to Demographic and Clinical Characteristics in High- Risk Infants	1Ayşe NUMANOĞLU AKBAŞ, 2Özge ÇANKAYA, 2Kübra SEYHAN, 2Mintaze KEREM GÜNEL	Ayşe NUMANOĞLU AKBAŞ
S07	Aşırı Düşük Doğum Ağırlıklı Bebeklerde Serebral Palsi Riski	Cerebral Palsy in Children with Extremely Low Birth Weight	Edibe Pembegül YILDIZ[1]	Edibe Pembegül YILDIZ
S08	2-4 Yaş Aralığındaki Serebral Palsili Çocukların Aktivite Ve Katılım Düzeylerinin İncelenmesi	Investigation Of Activity and Participation Levels Of Cerebral Palsy Children in 2-4 Years Old	Sefa Üneş1, Merve Tunçdemir1, Özge Çankaya1, Kübra Seyhan1, Cemil Özal1, Ayşe Numanoğlu Akbaş2, Umut Ece Arslan3, Hilal Özcebe4, Mintaze Kerem Günel1	Cemil ÖZAL
S09	Konjenital Müsküler Distrofili Olguda Nörogelişimsel Tedavi Yaklaşımı	Neurodevelopmental Therapy in a Case with Congenital Muscular Dystrophy	Meltem YAZICI[1], Pınar DÜNDAR[2]	Meltem YAZICI
S10	Görme Fonksiyonu Değerlendirmeleri ve Az Görenlere Yardım Cihazı Uygulamaları: Az Gören Rehabilitasyonu	Assesments of Visual Function and LVAs: Low Vision Rehabilitation	Şeyma AKÇİN1 İrem KURT1 Müberra TANRIVERDİ1	Şeyma AKÇİN
S11	Which approach is more effective in 6-18 months infants wiih Cerebral Palsy signs, neurodevelopmental therapy or following with home program? A Retrospectıve Study	Which approach is more effective in 6-18 months infants wiih Cerebral Palsy signs, neurodevelopmental therapy or following with home program? A Retrospectıve Study	Kübra Seyhan1, Özge Çankaya1, Merve Tunçdemir1, Sefa Üneş1, Mintaze Kerem Günel1	Sefa ÜNEŞ

S12	Yaşamın Erken Evresinde Gelişimsel Geriliği Ölçmek: İşlevsellik, Yeti Yitimi ve Sağlığın Uluslararası Sınıflandırması Kavramsal Çerçevesinin Prensiplerine Göre Değerlendirme Araçlarını Haritalamak: Sistematik Derleme	Evaluating Developmental Delay in Early Stage of Life: Mapping Assessment Tools From The International Classification of Functioning, Disability and Health	Hasan BİNGÖl1 , Hikmet KOCAMAN2	Hasan BİNGÖL
S13	Serebral Palsili Çocuklarda Çok Seviyeli Botulinum Toksin Enjeksiyonu Tekrar Sayısı İle Mobilite Seviyesi, Selektif Alt Ekstremite Motor Kontrolü, Yürüyüş Ve Denge Arasındaki İlişki	The relationship between the repetition of multi-level Botulinum Toxin Injection, mobility level, selective motor control of lower extremity, gait and balance in children with cerebral palsy	Kübra Seyhan1, Mintaze Kerem Günel1, Ece Ünlü Akyüz2	Kübra SEYHAN
S14	Obstetrik Brakial Pleksus Paralizisinde Raimondi El Fonksiyonları Sınıflama Sistemi İle Mini-Macs Değerleri Arasındaki İlişkinin Araştırılması	The Investigation of the Relationship Between Raimondi Hand Functions Classification System and Mini-Macs Values in Obstetric Brachial Plexus Paralysis	Kıvanç Delioğlu1, Tüzün Fırat1, Akın Üzümcügil2	Kıvanç DELİOĞLU
S15	Nöromotor Gelişimi Değerlendiren Testlerden İnfant Motor Profile ve Alberta Infant Motor Skala Arasındaki İlişkinin İncelenmesi	Investigation of the Relationship Between Infant Motor Profile and Alberta Infant Motor Scale Among Tests Evaluating Neuromotor Development	Derya AZİM REZAEİ1 Gönül ACAR2, Dilşad TÜRKDOĞAN3, Olcay ÜNVER3, Fatma KAYA NARTER4	Derya AZİM REZAEİ

S01 Serebral Palsi'li Çocuklarda Denge ve Solunum Kas Eğitiminin Fonksiyonel Kapasite, Denge, Solunum Fonksiyonları ve Solunum Kas Kuvvetine Etkileri

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Amaç: Serebral Palsi (SP) tanılı çocuklarda denge eğitimiyle birlikte uygulanan solunum kas eğitiminin fonksiyonel kapasite, denge, solunum fonksiyonları ve solunum kas kuvvetine etkilerini araştırmaktır.
Gereç ve Yöntem: Çalışmaya, Kaba Motor Fonksiyon Sınıflama Sistemi'ne göre seviye I ve II olan 30 hemiplejik SP'li olgu dahil edildi ve olgular randomizasyonla kontrol (n=15) ve çalışma (n=15) gruplarına ayrıldı. Tüm olgular 8 hafta boyunca haftada 1 seans fizyoterapist gözetiminde, haftada 2 seans ev programı olacak şekilde haftada 3 seans fizyoterapi rehabilitasyon programına alındı. Kontrol grubuna nörogelişimsel tedavi(NGT) temelli denge egzersizleri uygulanırken, çalışma grubuna NGT-temelli denge egzersizleriyle birlikte inspiratuar kas eğitimi (İKE) uygulandı. Demografik bilgileri alındıktan sonra tüm olgulara, Altı Dakika Yürüme Testi(6DYT), solunum fonksiyon testi, solunum kas kuvveti ölçümü ve Biodex Balance System® ile postüral stabilite ve denge değerlendirmesi yapıldı. Sekiz hafta tedavi sonrası tüm değerlendirmeler tekrarlandı.
Bulgular-Sonuçlar: SP'li çocuklarda solunum kas kuvveti ve solunum kas eğitimi ile ilgili kısıtlı sayıda araştırma vardır. Literatürde solunum problemlerinin SP tablosuna eşlik edebileceği belirtildiğinden, bu çocuklarda solunum kas kuvveti değerlendirmelerinin yapılmasının ve desteğe ihtiyacı olan çocuklarda fizyoterapi rehabilitasyon programlarına solunum kas eğitiminin de eklenmesinin SP'li çocuğun rehabilitasyon yönetimine büyük katkı sağlayacağını düşünmekteyiz.
Tartışma: Her iki grubun da tedavi öncesi ve sonrası FVC, FEV1, FEV1/FVC değeri değişmezken ($p < 0,05$), PEF, maksimum inspiratuar (MIP) ve ekspiratuar (MEP) ağız içi basınç değerlerinde, 6DYT mesafesinde artış, denge fonksiyonlarında (gözler kapalı değerlendirmeler hariç) gelişme saptandı ($p < 0,05$). Gruplar arası farkların karşılaştırmasında, solunum fonksiyonu, 6DYT mesafesi ve denge skorları arasında anlamlı fark bulunmazken ($p < 0,05$), MIP ve MEP değerlerinde çalışma grubu lehine anlamlı artış bulundu ($p < 0,05$).

The Effects of Balance and Respiratory Muscle Training on Functional Capacity, Balance, Respiratory Function and Respiratory Muscle Strength in Children with Cerebral Palsy

Purpose: To investigate effects of balance training and respiratory muscle training on functional capacity, balance, respiratory function and respiratory muscle strength(RMS) in children with Cerebral Palsy(CP).
Materials and Methods
Study included 30 cases with hemiplegic CP in levels I-II according to Gross Motor Function Classification System, were randomly assigned to a control(n=15) or a study(n=15) group. All cases underwent a physiotherapy program 3 times a week for 8 weeks; 1 exercise session was performed under supervision of a physiotherapist, other 2 sessions a week were performed at

home. While neurodevelopmental therapy(NDT)-based balance exercises were performed to control-group, and inspiratory muscle training(IMT) in addition to NDT-based balance exercises were performed to study-group. Six Minute Walking Test(6MWT), pulmonary function test, RMS measurement and postural stability-balance (with Biodex Balance System®) were evaluated in all cases, after 8 weeks of treatment all evaluations were repeated.
Results: PEF, maximum inspiratory(MIP) and expiratory(MEP) pressure values, 6MWT distance, equilibrium functions(except eyes closed) ($p < 0.05$) improved in both groups, whereas FVC, FEV1, FEV1/FVC was not changed before and after treatment($p < 0.05$). There was no significant differences in change scores of respiratory function, 6MWT distances, and balance scores between groups($p < 0.05$), whereas MIP, MEP values further increased in study-group compared to control-group($p < 0.05$).
Discussion: There are a limited number of studies regarding RMS and respiratory muscle training in children with CP. We think that RMS assessment in children with CP and identification of children who need it, and adding IMT to physiotherapy programs will contribute greatly to rehabilitative approach of children withCP.

S02 Bobath (Nörogelişimsel Tedavi) Yaklaşımının Riskli Bebeklerin Annelerinin Memnuniyeti Ve Yaşam Kalitesi Üzerindeki Etkileri

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Amaç: Çalışmanın amacı nörogelişimsel tedavi yaklaşımının (NDT) riskli bebeğe sahip annelerinin yaşam kalitesi ve memnuniyeti üzerine olan etkilerini incelemekti.
Gereç ve Yöntem: Çalışmaya gestasyonel yaşı 34 - 37. haftalar arasında, düzeltilmiş yaşı 24 ay ve öncesinde olan 8 bebek dâhil edildi. Bebeklerin herhangi bir sistemik rahatsızlığı yoktu ve bobath NDT yöntemi ile 8 hafta boyunca haftada iki seans olacak şekilde deneyimli bir fizyoterapist tarafından tedaviye alındı. Annelerin yaşam kalitesi tedavi öncesinde ve tedavi sonrasında Short Form-36 (SF-36) kullanılarak değerlendirildi. Annelerin çocukları ile ilgili memnuniyetleri ise görsel analog skalası ile değerlendirildi.
Bulgular-Sonuçlar: Bu pilot çalışmanın sonuçları NDT'nin riskli bebeklerin annelerinin yaşam kalitesi ve memnuniyet düzeyleri üzerinde olumlu etkiye sahip olduğunu göstermektedir. Bununla birlikte, kesin sonuçlar çıkarılmadan önce çalışmanın daha büyük örneklem üzerinde tekrarlanması gereklidir.
Tartışma: 5 erkek, 3 kızdan oluşan olgularımızın yaş ortalaması 16.0 ± 4.7 aydı. Tedavi sonrasında öncesine göre SF-36'nın alt ölçeklerinden olan fiziksel rol kısıtlılığı, vitalite, sosyal fonksiyon ve mental sağlık puanları anlamlı şekilde arttı ($p < 0.05$). SF-36'nın diğer alt ölçek puanlarında değişiklik olmadı ($p < 0.05$). Tedavi öncesi dönemle karşılaştırıldığında, tedavi sonrasında annelerin çocuklarının durumu ile ilgili memnuniyet düzeyleri de anlamlı şekilde arttı ($p < 0.05$).

Effects of neurodevelopmental therapy on the satisfaction and quality of life of mothers of risky babies
Purpose: The purpose of this study to investigate effects of Bobath (neurodevelopmental therapy (NDT) on the satisfaction and quality of life of mothers of risky babies.
Materials and Methods
The study ıncluded 8 babies with gestational age between 34 and 37 weeks and with corrected age of 24 months and before. Babies did not have any systemic diseases and were treated with Bobath NDT at two times a week during a total of 8 weeks. Quality of life of mothers was assessed at pretreatment and at the end of treatment using the Short Form-36 (SF-36). Mothers were also asked to rate their satisfaction regarding their children on the visual analog scale.
Results: The mean age of our subjects consist of 5 male, 3 female was 16.0 ± 4.7 month. Role limitations due to physical health, vitality, social functioning, and mental health scores of the SF-36 increased significantly comparing with pre-treatment assessment ($p < 0.05$). There was no change in the other subscale scores of the SF-36 ($p < 0.05$). Comparing with the pre-treatment period, the satisfaction levels of mothers regarding with their children status were also increased significantly in the post-treatment period ($p < 0.05$).
Discussion: The results of this pilot study revealed that NDT has positive effects on the satisfaction and quality of life levels of mothers of risky babies. However, replication in a larger sample of subjects is needed before firm conclusions can be drawn.

S03 Nörolojik Riskli Bebeklerde Motor Repertuarın Değerlendirilmesi

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Amaç: Bebeklerde gelişimsel ve nörolojik problemler çeşitli sebeplerden meydana gelebilir. Bu çalışma nörolojik açıdan riskli bebeklerde motor repertuarın değerlendirilmesi amacıyla planlandı.
Yöntem: Hacettepe Üniversitesi Fizyoterapi ve Rehabilitasyon Bölümüne değerlendirme ve takip amacıyla başvuran 6-9 ay arasındaki riskli bebekler çalışmaya dahil edildi. Bebeklerin medikal bilgileri hastane dosyalarından ve aileye sorularak kaydedildi. Motor repertuarının değerlendirilmesi için sırtüstü, yüzüstü, oturma ve ayakta duruşta olmak üzere dört farlı pozisyonda toplamda 15 dakika süren video kaydı alındı. Videolar üzerinden Infant Motor Profile (IMP) testine göre puanlama yapıldı.
Bulgular: Çalışmaya katılan 10 riskli bebek (5 term, 5 preterm) ve benzer yaşta 5 sağlıklı bebeğin ortanca yaşı 7 aydı (min:6 ay, max: 9ay). Riskli bebekler ve sağlıklı bebekler arasında IMP varyasyon, adaptasyon, simetri, akıcılık, performans, toplam alt başlıklarında anlamlı fark bulundu ($p<0.05$). İkişerli karşılaştırmalarda preterm-term, preterm-sağlıklı ve term-sağlıklı bebeklerin IMP alt başlıklarında anlamlı fark bulundu ($p<0.05$).

Tartışma: Preterm ya da term doğum sonrası nörolojik açıdan riskli bebeklerin takibi ve erken müdahale programlarına başlanması için IMP değerlendirmesinin profesyonellere yol göstereceği düşünülmektedir. Katılımcı sayısının fazla olduğu çalışmalara ihtiyaç vardır.
Anahtar kelimeler: Riskli bebek, Motor repertuar, Erken Müdahale

Evaluation the motor repertoire in neurologically risk infants
Purpose: Developmental and neurological problems in infants may occur for a variety of reasons. This study was planned to evaluate motor repertoire in neurologically risk infants.
Methods: Infants at risk aged between 6 and 9 months who were admitted to Hacettepe University Department of Physiotherapy and Rehabilitation for evaluation and follow-up were included in the study. Medical information of infants was recorded from hospital files and asking their family. In order to evaluate the motor repertoire, a total of 15 minutes of video recording was taken in four positions including supine, prone, sitting and standing positions. The video scores were rated according to the Infant Motor Profile (IMP) test.
Results: The median age of 10 risky infants (5 term, 5 preterm) and similar age of 5 healthy infants was 7 months (min: 6 months, max: 9 months). IMP variation, adaptation, symmetry, fluency, performance, total sub-headings were significantly different between risky infants and healthy infants ($p < 0.05$). There was a significant difference between the two sub-headings of IMP preterm-term, preterm-healthy and term-healthy infants in multiple comparisons ($p < 0.05$).
Conclusion: It is suggested that IMP assessment will lead the way for professionals in order to follow-up and initiate early intervention programs for infants with neurologic high risk after preterm or term delivery. More studies are needed with larger participants.
Key words: Risk infant, Motor repertoire, Early intervention

S04 One deep way *of learning* "child*, parent and therapist teamwork" in Bobath Concept.*

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Purpose: Nowadays' paradigm of the relationship between therapists and patients has evolved. We hypothesized that concrete aspects of teamwork should be integrated during whole days sharing process. We organized a ten-day advanced course. The core involved teamworking with families to find out the individual needs of children, up to three-year-old.
The aim of this presentation is to share parent's reflections about the NDT Bobath therapist's role and to show the effects of an active interaction between children, parents and therapists.
Method: We accepted only team registration: child, parent and therapist. Each parent/therapist team picks their SMART goals according to parents' priorities. The ways to achieve the goals are guided by the child's needs from a therapeutic prospective view.
Results: All families were fully engaged during the whole course, keen to continue with their therapists and asking for a second intensive course. GAS results, together with videotape and semi-structured anonymous surveys, will be presented.
Conclusions: We found this experiment unique regarding parent's reflections, children's feedbacks and therapist's skills development. We are planning to pursue this process with older children. We encourage other groups to become part of this experiment.
Key words: families, teamwork, babies, toddlers

S05 Okul Öncesi Yaş Grubundaki Serebral Palsi'li Çocuklarda Türkçe Yaşam Alışkanlıkları Anketinin Geçerlik ve Güvenilirliği

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Amaç: Bu çalışmanın amacı okul öncesi dönem Serebral Palsi'li (SP) çocuklarda katılımı değerlendiren Yaşam Alışkanlıkları Anketi'nin (Life-Habits Questionnaire, Life-H) Türkçe adaptasyonunun, geçerlilik ve güvenirliğinin incelenmesiydi.
Yöntem: Çalışmaya pediatrik nörolog tarafından SP tanısı konulan, 2-4 yaş arasında 66 SP'li çocuk ve aileleri katıldı. Çalışmaya dahil edilen çocukların kaba motor fonksiyonları Kaba Motor Fonksiyon Sınıflandırma Sistemi (GMFCS) ile, katılımları Life-H ile değerlendirildi. Life-H'nin altın standardı olarak Pediatrik Veri Toplama Aracı (PODCI) kullanıldı. Life-H anketinin geçerliği, Life-H ile PODCI arasındaki korelasyon katsayısı (geçerlik katsayısı) ile değerlendirildi. Life-H ölçeğinin güvenirliğini belirlemek amacıyla ilk değerlendirmeden 2 hafta sonra tekrar-test uygulaması yapıldı.
Bulgular: Spearman's rho korelasyon katsayısı 0,522-0,871 arasında değişmekteydi. Elde edilen bu bulgulara göre Life H anketinin alt boyutlarının orta (rho=0,50-0,69), yüksek (rho=0,70-0,79) ve mükemmel (rho=0,80-1,00) geçerliğe sahip olduğu gözlendi. 2-4 yaş grubu çocuklar için en güçlü ilişkinin Life-H Barınma alt ölçeği ile PODCI Fiziksel Fonksiyon ve Spor alt ölçeği arasında olduğu belirlendi. Test tekrar-test analizi sonuçlarına göre hareket kabiliyeti alt ölçeği için Spearman's rho korelasyon katsayısı düşük bulundu (rho=0,452). Bunun dışında tüm alt ölçekler için güvenirlik değerleri tatmin edici sevideydi.
Tartışma: Life-H'nin Türkçe versiyonu SP'li çocukların katılım düzeylerini ölçmede geçerli ve güvenilir bir yöntem olduğu düşünülmektedir. Geçerlilik ve güvenirlik çalışmaları ve veri toplama aşaması devam etmektedir.
Anahtar Kelimeler: Serebral Palsi, Katılım, Life-H

Validity and Reliability of the Turkish Life Habits Questionnaire in Preschool Children with Cerebral Palsy
Purpose: The aim of this study was to investigate the validity and reliability of Turkish adaptation of Life Habits Questionnaire (Life-H) in pre-school children with Cerebral Palsy (CP).
Methods: The study included 66 children with CP aged 2-4 years and their families, children who diagnosed with CP by pediatric neurologist. Gross motor functions were assessed with the Gross Motor Function Classification System (GMFCS) and participation with Life-H. The Pediatric Outcomes Data Collection Instrument (PODCI) was used as the gold standard of Life-H. The validity of the Life-H questionnaire was assessed by the correlation coefficient (validity coefficient) between Life-H and PODCI. 25 child and their families were re-evaluated 2 weeks after the first evaluation in order to determine the reliability of the Life-H scale.
Results: Spearman's rho correlation coefficient ranged from 0.522 to 0.871. According to these findings, it was observed that the sub-dimensions of the Life H questionnaire had medium (rho=0.50-0.69), high (rho=0.70-0.79) and excellent (rho=0.80-1.00) validity. The strongest relationship was found between the Life-H "Housing subscale" and the PODCI "Physical Function and Sports subscale". The Spearman's rho correlation coefficient was found to be low for the mobility subscale according to test-retest analysis results (rho=0.452). Apart from this, the reliability values for all subscales were satisfactory.
Conclusion: The Turkish version of Life-H is considered to be a valid and reliable method for assessing children with CP. Validity, reliability studies and data collection are in progress.
Keywords: Cerebral Palsy, Participation, Life-H

S06 Riskli Bebeklerde Demografik ve Klinik Özelliklere Göre Motor Profil Analizi

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Amaç: Riskli bebek tanımı çevresel ya da biyolojik faktörler nedeniyle nöromotor gelişim problemleri gösterebilecek bebekleri ifade etmektedir. Risk faktörlerinin yanı sıra cinsiyet, doğum ağırlığı, gestasyonel yaş gibi demografik ve klinik özelliklerin de bebeklerin normal motor gelişimi üzerinde etkileri olabileceği ifade edilmektedir. Bu çalışmanın amacı riskli bebeklerde motor profilin demografik ve klinik özelliklere göre analiz edilmesidir.
Yöntem: Çalışmaya düzeltilmiş yaşı 3-12 ay arasında olan 33 (14 kız, 19 erkek) riskli bebek dâhil edildi. Bebekler düzeltilmiş yaşlarına göre 3-6 ve 7-12 olmak üzere iki yaş aralığına ayrıldı. Riskli bebeklerin spontan motor davranışlarını değerlendirmek için İnfant Motor Performansı (IMP) kullanıldı. IMP'in varyasyon, adaptasyon, simetri, akıcılık ve performans boyut puanları ve toplam puanı hesaplandı. Bebeklerin düzeltilmiş yaşları, doğum ağırlıkları ve gestasyonel yaşları kaydedildi.
Sonuçlar: Her iki yaş grubu için oluşturulan cinsiyet, gestasyonel yaş ve doğum ağırlığı alt gruplarında bebeklerin düzeltilmiş yaşları açısından fark yoktu (p>0.05). Düzeltilmiş yaşı 3-6 ay arasındaki bebeklerin cinsiyet karşılaştırmalarında IMP Simetri (p=0,014) puanının erkek bebeklerde daha yüksek olduğu, gestasyonel yaş karşılaştırmalarında IMP Akıcılık (p=0,010) puanının term dönemde doğan bebeklerde daha yüksek olduğu ve doğum ağırlığı karşılaştırmalarında IMP Akıcılık (p=0,028) puanının normal doğum ağırlıklı bebeklerde daha yüksek olduğu görüldü.
Tartışma: Çalışmamızın sonuçları 3-6 ay arasındaki riskli bebeklerde demografik ve klinik özelliklerle motor profil arasında bir bağlantı olduğu ancak bu durumun büyüme ile ortadan kalktığı görüldü.
Sonuç: Çalışmamızın sonuçları bebek gelişiminin erken dönemlerinde demografik ve klinik özelliklerin bebek motor profili üzerinde rol oynadığını göstermektedir.
Anahtar Sözcükler: Bebek Gelişimi, Risk, Prematüre Doğum

Motor Profile Analysis according to Demographic and Clinical Characteristics in High- Risk Infants
Purpose: High-risk infant definition refers to infants who may exhibit neuro-motor development problems due to environmental or biological factors. It is stated that demographic and clinical features such as gender, birth weight, gestational age, as well as risk factors may have effects on normal motor development. The aim of this study is to analyze motor profile according to demographic and clinical characteristics in high-risk infants.
Methods: The study included 33(14 female, 19 male) high-risk infants with a corrected age of 3-12 months. The infants were divided into two age groups: 3-6 and 7-12 according to their corrected age. Infant Motor Performance (IMP), was used to evaluate spontaneous motor behavior of high-risk infants. Variance, adaptation, symmetry, fluency, performance dimension scores and total score were calculated. Corrected ages, birth weights and gestational ages of the infants were recorded.
Results: There was no significant difference in gender, gestational age and birth weight subgroups of both age groups (p> 0.05). It was found that IMP symmetry (p=0.014) was higher in male infants, IMP Fluency (p=0.010) was higher in term-born infants and IMP fluency (p=0.028) was higher in normal birth weight infants in 3-6 months age group.
Discussion: Results of our study showed that there was a connection between demographic and clinical features and motor profile in the high-risk infants between 3-6 months, but this condition disappeared with growth.
Conclusion: The results of our study show that demographic and clinical features play a role in infant motor profile in the early stages of infant development.
Keywords: Infant Development, Risk, Premature Birth

S07 Aşırı düşük doğum ağırlıklı bebeklerde serebral palsi Riski

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Giriş: Yenidoğan yoğun bakımındaki ilerlemelerin morbidite ve mortaliteyi azaltması beklenirken çok düşük doğum ağırlıklı prematürelerin yaşatılması ile bu oran 70-100 kat artmıştır. Bu hastalarda görme-işitme sorunları, iletişim, algılama ve davranış bozuklukları, epilepsi eşlik edebilir. Kliniğimizde takibi yapılan aşırı düşük doğum tartılı çocukların prognozu ile ilgili deneyimimizi paylaşmayı amaçladık.
Yöntem: Haziran 2017-Eylül 2018 tarihleri arasında Çocuk Nöroloji kliniğimize başvurmuş ve düzeltilmiş yaşları 9 aydan sonra, en az 3 ay ara ile en az iki kez muayenesi yapılmış, doğum tartısı <1000gr altında (Aşırı düşük doğum tartılı-ADDT) olan hastalar çalışma grubunu oluşturdu. Hastalar aynı pediatrik nörolog tarafından serebral palsi (SP) ve minör nörolojik disfonksiyonların belirlenebilmesi için muayene edildi.
Bulgular-Sonuçlar: Doğum tartısı <1000gr altında olan 84 hasta (41 kız) çalışma grubunu oluşturdu. Hastaların ortalama yaşları 39,3 ay (9 ay-13 yaş), ortalama doğum tartıları 903,5gr (490gr - 1000gr) ve ortalama gestasyonel haftaları 27,9 hafta (22-32 hafta) idi.
Kırksekiz hasta (%57) serebral palsi tanısı almıştı. Bu hastaların 23'ü (%48) spastik dipleji, 15'i (%31) spastik tetrapleji, 9'u (%18) spastik hemipleji ve 1'i (%2) diskinetik serebral palsi olarak tanımlandı. SP tanılı hastalardan 15'inde (%31) görme bozukluğu, 5'inde (%10) işitme sorunu mevcut olup 12'si epilepsi tanısı ile izlenmekte olan hastalar idi. ADTT hastalarımızda 29'unda kognitif gerilik saptanmış olup bunların 26'sı CP tanılı idi. Ayrıca 11 hastamızda çoğul gebelik öyküsü mevcut olup bunların da 10'u CP idi.
Sonuç: Bu çalışmada ADDT bebeklerin yarısından fazlası CP tanısı almıştır. CP sıklığındaki bu yüksek oran, ADDT hastalarının nöromotor kapasitelerinin en üst düzeye çıkarılması için yakın izlemlerini gerektirir.

Cerebral Palsy in Children with Extremely Low Birth Weight
Introduction: Although incidence of the cerebral palsy (CP) is expected to be decreased by the improvements in the neonatal intensive care, its rate have been increased 70 to 100 times because of keeping extremely low birth weight (ELBW) premature babies alive. Visual-auditory problems, communication, perception and behavioral disorders and epilepsy can be seen in these patients. We aimed to share our experience regarding the prognosis of ELBW patients.
Methods: Children who were referred to our clinic with ELBW (<1000 gram), between June 2017 and September 2018, and examined at least twice with 3 months of intervals were included in the study. All patients were evaluated by the same pediatric neurologist for their diagnosis of CP and minor neurologic dysfunctions.
Results: Eighty-four (41 girls) of 84 patients who had <1000 gram birth weight included in the study.The mean age of the patients was 39.3 months (range; 9 months to 13 years), the mean weight was 903.5 g (range; 490 g to 1000 g) and their mean gestational duration was 27.9 weeks (range; 22 to 32 weeks), Forty-eight patients (57%) were diagnosed with CP. These patients were diagnosed as spastic diplegia (n=23; 48%), spastic tetraplegia (n=15; 31%), spastic hemiplegia (n=9; 18%) and dyscinetic CP (n=1; 2%). In patients with the diagnosis of CP, there were visual problems in 15 (31%) patients and auditory problems in 5 (10%) patients, and 12 patients were followed with the diagnosis of epilepsy. We determined cognitive retardation in 29 patients with ELBW and 26 of these patients was diagnosed with CP. In addition, 11 patients were multipar and 10 of these patients were CP.
Conclusion: In this study, more than half of the patients with ELBW were diagnosed as CP. This high rate of CP requires close follow-up of the patients with ELBW in order to increase their neuromotor capacity to highest possible level.

S08 2-4 YAŞ ARALIĞINDAKİ SEREBRAL PALSİLİ ÇOCUKLARIN AKTİVİTE VE KATILIM DÜZEYLERİNİN İNCELENMESİ

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Amaç: Türkiye'deki insidansı yaklaşık 4,4/1000 canlı doğum olan Serebral Palsi (SP), çocuklarda motor engelin en sık nedenidir. SP'li çocukların fonksiyonel bağımsızlığı ve toplum içindeki aktivite ve katılımları kısıtlanmakta, yaşam kaliteleri olumsuz yönde etkilenmektedir. Bu çalışmamızda 2-4 yaş arasındaki SP'li çocukların aktivite ve katılım düzeylerinin erken dönemde incelemeyi planladık.
Yöntem: Bu çalışma TUBİTAK 1001 projesi kapsamında yapıldı. 2-4 yaş aralığında toplam 66 SP'li çocuk çalışmaya dahil edildi. Çocukların demografik bilgileri ailelerine sorulup kaydedildi. Çocuklar kaba motor fonskiyon düzeyleri, Kaba Motor Fonksiyon Sınıflandırma Sistemi (GMFCS) ile belirlendi. Çocukların aktivite ve katılımını değerlendirmek için Pediatrik Özürlülük Değerlendirme Kaydı (PEDI) kullanıldı. GMFCS seviyelerine göre 5 grubu ayrıldı. Gruplar arasında PEDI'nın kendine bakım, mobilite ve sosyal fonksiyonlar alt parametrelerinin değişimi incelendi. İstatiksel analiz için SPSS.22 programı kullanıldı. Gruplar arasında fark olup olmadığına bakmak için Kruskal-Wallis Testi, gruplar arasındaki farkın belirlenmesi için ikili karşılaştırmalarda Mann-Whitney-U testi kullanıldı ve anlamlılık düzeyi $p<0.05$ olarak belirlendi.
Bulgular: Gruplardaki çocukların yaş, boy, kilo, doğum haftası ve kilosu benzerdi. Çocukların PEDI alt parametrelerinin hepsinde GMFCS seviyeleri arttıkça bağımsızlık düzeyinde azalma vardı. GMFCS 1, 2 ve 3 arasında PEDI'nin puan değişimlerinden sadece mobilite parametresindeki fark istatiksel olarak anlamlı bulundu ($p<0.05$). Ancak GMFCS 4 ve 5 arasında PEDI'nin alt parametrelerinin hepsindeki değişim istatiksel olarak anlamlıydı ($p<0.05$).
Tartışma: Çalışmamızda SP'li çocukların erken yaşlardan itibaren aktivite ve katılım düzeyinde azalma olduğu görülmüştür. Bu azalma fonksiyonel seviyesi iyi olan çocuklarda sadece hareket etmede meydana gelirken, fonksiyonel durum kötüleştikçe

mobilite, kendine bakım ve sosyal fonksiyonlarda da görülmektedir. SP'li çocukların tedavisine en erken yaşta başlanılmalı ve tedavide çocuğa bütüncül yaklaşılmalıdır.
Anahtar Kelimeler: serebral palsi, aktivite, katılım, PEDI

INVESTIGATION OF ACTIVITY AND PARTICIPATION LEVELS OF CEREBRAL PALSY CHILDREN IN 2-4 YEARS OLD
Purpose: Cerebral palsy(CP) with an incidence of 4.4/1000 live births in Turkey is the most common cause of motor impairment in children. Functional independence of children with CP and their activity and participation are restricted. In this study, we planned to investigate the activity and participation levels of children with CP between the ages of 2-4 years.
Methods: This study was conducted within the scope of TUBITAK-1001 project. 66 children with CP were included. Children's demographic informations were recorded. Gross Motor Function Classification System(GMFCS) was used for children's gross motor function level and Pediatric Evaluation Disability Inventory(PEDI) for children's activity and participation. Children were divided into 5 groups by GMFCS levels. PEDI self-care, mobility and social functions sub-parameters were analyzed. SPSS.22 program was used for statistical analysis. Mann-Whitney-U-Test was used for pairwise comparisons to determine differences between groups. Significance level was determined as p<0.05.
Results: Children's age, height, weight were similar. In all of sub-parameters, there was a decrease in independence's level as the GMFCS levels increased. In the GMFCS 1,2 and 3, cahnges in only the mobility were statistically significant(p<0.05). However, ın the GMFCS 4 and 5 the changes in all of the sub-parameters were statistically significant(p<0.05).
Concluison: We observed children with CP had decreased activity and participation level from an early age. This decrease occurs in only moblity sub-parameter in children with good functional status, but in children with poor functional status it occurs in all parameters. Treatment should be started at the earliest age and it should be holistic.
Keywords: cerebral palsy, activity, participation, PEDI

S09 Konjenital Müsküler Distrofili Olguda Nörogelişimsel Tedavi Yaklaşımı

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Amaç: Bilateral konjenital kalça çıkığı tanısıyla takip edilen, 6 aylıkken kalça subluksasyonu nedeniyle opere edilen,2 yaşında Konjenital Müsküler Distrofi tanısı almış, erkek olgu.Üç yaşına kadar cerrahi uygulama, alçılama gibi sebeplerle ayakta durma veya ayaklarına ağırlık aktarma denenmemiş, fizyoterapi ve rehabilitasyon programına başlanmamıştır.
Gereç ve Yöntem: İlk değerlendirmesine göre; alt ve üst ekstremite de yüksek kuvvet kaybı, sağ kalça da subluksasyon, sağ dizde 10 derecelik ekstansiyon limitasyonu vardı. Sağ taraf ekstremitelerdeki kas gücü soldan zayıftı. Bağımsız oturma pozisyonunda kalabiliyor, dizüstü tutunarak adım alabiliyor, transferlerini sağlayamıyor ve ayakta yardımla 10 sn durabiliyordu. Ajite ve terapiyi reddediyordu. Tedavi programında ilk olarak ilişki kurmak amaçlanarak oyun ve nörogelişimsel yaklaşım prensipleriyle çalışılmaya başlandı. Vertikal pozisyonda kalma süresinin artırılması hedeflenerek oyunlarla ekstansör duruş, postür ve tonus geliştirilmeye çalışıldı. Germe egzersizleriyle 6 ayın sonunda diz ekstansiyonunda 2-3 derecelik artış sağlandı. Alt ekstremite kapalı kinetik halka içinde kuvvetlendirilmeye, üst ekstremite enduransı açık kinetik halka ile geliştirilmeye çalışıldı. Gövde egzersizleri ile dinamik stabilizasyon geliştirildi. Stabilite egzersizleriyle birlikte solunum egzersizleri oyun oynama sırasında verildi.
Bulgular-Sonuçlar: Sağ dizi için kullanılan immobilizer ile ev içinde desteksiz yürüyebilmeye, bisiklet sürebilmeye, havuzda 1-2 m yüzebilmeye başladı.
Tartışma: 1 yıl sonra destekli ayakta durmaya, yardımla masa kenarında sıralamaya başladı. 2 yıl sonra walkerla adım alabilmeye, ayakta destekli durabilmeye başladı. 3. yılın sonunda kas kuvvetindeki zayıflıklara rağmen enduransı ve ayakta yürüme fonksiyonelliği arttı.
Neurodevelopmental Therapy in a Case with Congenital Muscular Dystrophy
Purpose: A male patient who was diagnosed bilateral congenital hip dislocation, left hip was operated at 6 months old, diagnosed Congenital Muscular Dystrophy at 2 years old. Up to age of 3 years, he couldn't stand or give weight to feet due to surgical applications, castings and physiotherapy programme was not started.
Materials and Methods: According to first evaluation; upper and lower extremities had loss of strength , right hip subluxation, right knee extension limitation of 10 degrees. Strength in right extremity is weaker than left. He could stay in independent sitting position, stepping on his knees, unable to make his transfers, stand for 10 seconds with help. He was agitated, refusing therapy. In treatment programme, aim was to establish relationship with games, to perform principles neurodevelopmental approach. Attempts were made to improve posture, tone, extender strength and standing time. Stretching exercises increased knee extension 2-3 degrees after 6 months. Lower extremities were strengthened in closed kinetic ring, endurance of upper extremities were developed in open kinetic ring. Trunk exercises improved dynamic stabilization. Breathing exercises was given with stability exercises while playing games.
Results: He began to standing with help, cruising around table after 1 year. After 2 years, he started to walk with walker and assisted standing. At the end of 3rd year, despite weakness in muscle strength, endurance, walking function increased.
Discussion: He began to ride bicycles, swim 1-2 m in pool, walk without support inside house with using immobilizer for right knee.

S10 Görme Fonksiyonu Değerlendirmeleri ve Az Görenlere Yardım Cihazı Uygulamaları: Az Gören Rehabilitasyonu – Sistematik Literatür Taraması

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Amaç: Çalışmamızda amacımız, az gören ve az gören çocuklarda rehabilitasyona yönelik yaklaşımların kanıta dayalı olarak yer aldığı literatür taramasıdır.
Gereç ve Yöntem: Sistematik literatür taraması, Sistematik İncelemeler için Tercih Edilen Raporlama Öğeleri (PRISMA) bildirisine göre hazırlanmıştır. Üç yazar bağımsız olarak Az Gören bireylerin rehabilitasyonunu içeren çalışmaları PUBMED, COCHRANE ve PEDRO online arama motorları ile taradı. 1988 ve 2018 yılları arasında yayımlanan, "low vision, visually impaired persons, retinopathy of prematurity, vision aids" anahtar kelimelerinin taramaları yapıldı. Randomize kontrollü çalışmalar (RCT'ler) ve kontrollü klinik denemeler (CCT'ler) dahil edildi. Çalışmaların kalitesi, Tavsiye Değerlendirme, Geliştirme ve Değerlendirme (GRADE) kriterlerini kullanarak derecelendirildi. Makalelere ulaşıldıktan sonra metodolojik kalite için QUADAS-2 kontrol listesi kullanıldı.
Bulgular-Sonuçlar: Günlük yaşamda öğrenme ve gelişim açısından görme önemlidir.Bu sebeple görme bozukluğu olan çocuklarda ve infantlarda görsel rehabilitasyon ve habilitasyon vazgeçilmezdir. Az görenlere yardım cihazları ve yardımcı teknolojiler görme özürlü çocukların görme oranını artırmalarında etkilidir.
Tartışma: 171 makale bulundu, dahil edilme ve dışlama kriterlerine göre elenen çalışmalarla 14 çalışma: görme problemleri, görsel sistem ölçümleri, görsel plastisite, görsel-motor entegrasyonu, yardımcı cihazlar, kortikal görme bozukluğu. Bu çalışmalar 1988-2018 yıllarına aitti. Değerlendirme yöntemi olarak; Landolt C-test, Illiterate E-chart, Manchester Low Vision Questionnaire, Vision Specific QoL, Nottingham Adjustment Scale, VR-QoL Questionnaire, Neale Analysis of Reading Ability, The Beery-Buktenica VMI, Groninger Motor Observation, Scale (GMOS) kullanılmıştı. Tedavi ve tedaviye yardım olarak; Le Bon Départ, Duyu Bütünlüğü, Görsel Algılama Eğitimi, Büyüteç, Teleskop, CCTV, Gözlük kullanışmıştı.

Assesments of Visual Function and LVAs : Low Vision Rehabilitation – Systematic Literature Review
Purpose: Our aim to the study was update current evidence base about low vision and low vision rehabilitation with children, systematically examining research literature.
Materials and Methods: We followed Preferred Reporting Items for Systematic Reviews(PRISMA) statement to conduct review. Three authors (S.A,I.K,M.T) independently conducted systematic literature search using electronic database: PubMed, Cochrane, and PEDro, published between 1988-2018, Keywords/MeSH terms used for search included following: "low vision, visually impaired persons, retinopathy of prematurity, vision aids" We included randomised controlled trials(RCTs) and controlled clinical trials(CCTs). After articles had been reached, we was used QUADAS-2 checklist for methodological quality.
Results: 171 articles were identified, 14 of which met eligibility criteria and selected for present systematic review: vision disorders, measures of visual system, visual plasticity, visual-motor integration, assistive technologies,cerebral visual impairment. These studies published at 1988-2018. Evaluation methods: Landolt C-test, Illiterate E-chart, Manchester Low Vision Questionnaire, Vision Specific QoL, Nottingham Adjustment Scale, VR-QoL Questionnaire, Neale Analysis of Reading Ability, The Beery-Buktenica VMI, Groninger Motor Observation, Scale (GMOS). Treatments: Sensory Integration, Le Bon Départ. Visual Perception Training, Magnifiers, Telescopes, CCTV, Eyeglasses.
Discussion: Vision is significant in developing and learning in daily life. Therefore, visual rehabilitation and habilitation is indispensable for infants and children with vision impairment. Low vision aids and assistive technologies were effective methods to increase the vision of visually impaired children.

S11 *Which approach is more effective in 6-18 months infants wiih Cerebral Palsy signs, neurodevelopmental therapy or following with home program? A Retrospectıve Study*

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Amaç: Serebral Palsi belirtileri gösteren 6-18 Aylık bebeklerde Nörogelişimsel Yaklaşım ile Ev Programının etkinliğini karşılaştırmak amacıyla yapıldı.
Yöntem: Pediatrik nörolog tarafından Serebral Palsi belirtileri gösterdiği öngörülen ve erken müdahale kapsamında alınması için Hacettepe Üniversitesi, Sağlık Bilimleri Fakültesi, Fizyoterapi ve Rehabilitasyon Bölümü, Serebral Palsi ve Pediatrik Rehabilitasyon Ünitesine yönlendirilen bebeklerin Aralık 2016-Ağustos 2018 tarihleri arasında dosyaları retrospektif olarak tarandı. Yaşları 6 ile 18 ay arası olan 18 bebeğin verisi incelendi. Serebral palsi ve Pediatrik Rehabilitasyon Ünitesine ailesi ile gelerek altı ay/ haftada iki gün/ günde bir saat Nörogelişimsel Yaklaşım almış dokuz bebek NGY grubuna alındı. Sadece ev programı ile takip edilen 9 bebek ise EP grubuna alındı. Her iki grupta bebeklerin tedavi öncesi ve sonrası kaba motor fonksiyonlarını kaba motor fonksiyon ölçeği (GMFM-88) ve sınıflandırma sistemi (GMFCS) sonuçları incelendi. İstatistiksel karşılaştırma için Wilcoxon testi kullanıldı, $p<0.05$ anlamlı kabul edildi.
Bulgular: Bebekler yaş, boy, kilo, doğum haftası, doğum kilosu ve motor fonksiyon seviyesi olarak benzerdi. NGY grubunda GMFM'nin GMFM'nin $p_{Sırtüstü\text{-}yüzüstü}=0,027$; $p_{oturma}=0,007$; $p_{emekleme\text{-}dizüstü}= 0,007$; $p_{ayakta\ durma}=0,008$, $p_{yürüme\text{-}koşma\text{-}merdiven\ çıkma}=0,018$; $p_{GMFM\ toplam}=0,012$; $p_{GMFCS}=0,008$'di. EP grubunda $p_{Sırtüstü\text{-}yüzüstü}=0,043$, $p_{oturma}=0,042$, $p_{emekleme\text{-}dizüstü}=0,109$; $p_{ayakta\ durma}=0,317$; $p_{yürüme\text{-}koşma\text{-}merdivençıkma}=0,317$; $p_{GMFM\ toplam}=0,027$ ve $p_{GMFCS}=0,157$'ydi.
Tartışma: NGY grubunda yüzüstü-sırtüstü, oturma, ayakta durma ve yürüme alt bölümlerinde ve bebeklerin mobilite seviyesinde gelişme olurken, EP grubunda gelişim sadece yüzüstü-sırtüstü ve emekleme alt bölümlerinde oldu. Nörogelişimsel yaklaşım ve ev programı riskli bebeklerin kaba motor fonksiyon gelişiminde etkilidir. Sadece ev programı ile takip yerine oyun odaklı nörogelişimsel uygulamalar ve ev programının gelişimi daha çok destekleyeceği düşünülmektedir.
Anahtar sözcükler: Nörogelişimsel yaklaşım, riskli bebek, ev programı

Which approach is more effective in 6-18 months infants wıih Cerebral Palsy signs, neurodevelopmental therapy or following with home program? A Retrospectıve Study

Purpose: To compare the effectiveness of the neurodevelopmental therapy with home program in 6-18 months old infants with cerebral palsy (CP) sings.
Methods: The files of the infants who had cerebral palsy sings and were referred for early intervention by the pediatric neurologist to Hacettepe University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Cerebral Palsy and Pediatric Rehabilitation Unit were retrospectively reviewed between December 2016 and August 2018. Eighteen infants aged 6-18 months were analyzed. Nine infants, who came to take Neurodevelopmental therapy (NDT) one hour a day/twice a week/six months, were included in NDT group. Nine infants, who came to take home program, were included in HP group. In both groups, the results of gross motor function measurement (GMFM-88) and classification system (GMFCS) were evaluated before and after treatment. Wilcoxon test was used for statistical comparison, p <0.05 was considered significant.
Results: Infants were similar in age, height, weight, birth week, birth weight and motor function level. In the NDT group: $p_{supine-prone}=0.027$, $p_{sitting}=0.007$, $p_{crawling-overtheknee}=0.007$, $p_{standing}=0.008$, $p_{walking-running-climbing}g=0.018$, $p_{GMFMtotal}=0.012$ and $p_{GMFCS}=0.008$. In the HP group: $p_{supine-prone}=0.043$, $p_{sitting}=0.042$, $p_{crawling-overtheknee}=0.109$, $p_{standing}=0.317$, $p_{walking-running-climbing}=0.317$; $p_{GMFMtotal}=0.027$ and $p_{GMFCS}=0.157$.
Conclusion: Whereas there were improvements in all prone–supine, sitting, standing and walking sub-dimensions and mobility level in the NDT group, the developments were only in the prone-supine and crawling sub-dimensions in the HP group. Neurodevelopmental therapy and home program are effective in the development of gross motor function of risky-infants. Game based-NDT with home program should support the motor development more than only home program follow up.
Keywords: Neurodevelopmental therapy, risky infant, home program

S12 Yaşamın Erken Evresinde Gelişimsel Geriliği Ölçmek: İşlevsellik, Yeti Yitimi ve Sağlığın Uluslararası Sınıflandırması Kavramsal Çerçevesinin Prensiplerine Göre Değerlendirme Araçlarını Haritalamak: Sistematik Derleme

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Amaç: Motor gelişim veya engellilik problemi yaşayan çocukların tespiti gelişimsel izleme, muayene ve tekrar muayene süreçlerinden meydana gelmektedir. Bu süreçte vücut yapısı ve işlevselliğini, aktivite ve katılımı ölçen çeşitli değerlendirme araçlarından yararlanılır. Dolayısıyla bu sistematik derlemenin amacı; risk altındaki çocuklarda erken teşhis için kullanılan tüm değerlendirme araçlarını tespit etmek ve bunları araştırmalarda veya klinik ortamlarda kullanım amaçlarını göz önünde bulundurarak İşlevsellik, Yeti yitimi ve Sağlığın Uluslararası Sınıflandırması kavramsal çerçevesinin temel alanlarına göre sınıflandırmaktır.
Gereç ve Yöntem: Altı farklı veri tabanı (Cochrane Library, EMBASE, Ovid MEDLINE, PubMed, www.tandfonline.com, Wiley Library) kapsamlı olarak tarandı
Bulgular-Sonuçlar
Farklı değerlendirme araçları riskli doğan bireylerin vücut yapısı & fonksiyonlarını, aktivite ve katılımlarını içeren ICF'in farklı alanlarını ölçer. Bu nedenle değerlendirme araçları amaca uygun olarak seçilmelidir
Tartışma: Toplam 40 farklı değerlendirme aracı belirlendi ve İşlevsellik, Yeti yitimi ve Sağlığın Uluslararası Sınıflandırması kavramsal çerçevesinin temel alanları baz alınarak karakterize edildi. Bu bakış açısından yola çıkarak araştırmacılar, motor (b760), duyu (b260,b265) ve kas iskelet sistemlerinin (b710) yanı sıra primitif refleksleri (b750), postural reaksiyonları (b755), fonksiyonel hareketleri (b750-b789), spontan hareketleri, iletişimi (d310) (b7619) vb. göz önünde bulundurdular. Belirlenen değerlendirme araçların yapılan sınıflandırma neticesinde çoğunun vücut fonksiyonu ile ilgili olduğu, bazılarının ise aktivite ve katılım ile ilgili olduğu sonucuna varıldı .

Evaluating Developmental Delay in Early Stage of Life: Mapping Assessment Tools From The International Classification of Functioning, Disability and Health' Principle: A Systematic Review Of Tools

Purpose: The phase of detection of children with delays or disability in motor development comprises developmental screening, examination, and reexamination. In the course of this process, different types of tools are utilized, assessing body structure & function, activity and participation. Accordingly, the aim of this systematic review is to retrieve the all assessment tools used for early identification in children at risk and to allocate these tools into International Classification of Functioning, Disability and Health' main domain considering the purpose of their use in clinic setting and researches
Materials and Methods: Six electronic databases (Cochrane Library, EMBASE, Ovid MEDLINE, PubMed, www.tandfonline.com, Wiley Library) were searched comprehensively
Results: A total of forty assessment tools were defined and characterized with respect to International Classification of Functioning, Disability and Health' main domain. On the basis of this perspective, the researchers took into account motor (b760), sensory (b260,b265) and musculoskeletal system (b710), besides, primitive reflexes (b750), postural reactions (b755), functional movement (b750-b789), spontaneous movements (b761), communication (d310) and etc. While the many of these defined tools are about the body function, some of these are proper for activity and participation.
Discussion: Various types of assessment tools evaluate different aspects of ICF, including body function& structure, activity and participation. For this reason, the tools should be selected according to purpose of the evaluation.

S13 Serebral Palsili çocuklarda Çok Seviyeli Botulinum Toksin Enjeksiyonu tekrar sayısı ile mobilite seviyesi, selektif alt ekstremite motor kontrolü, yürüyüş ve denge arasındaki ilişki

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Amaç: Serebral Palsili (SP) çocuklarda spastisite tedavisinde çok seviyeli Botulinum Toksin (BT) enjeksiyonu yaygın olarak kullanılmaktadır. Bu çalışma alt ekstremitede çok seviyeli BT tekrar sayısının SP'li çocukların mobilitesi, selektif motor kontrolü, yürüme ve denge becerisi ile ilişkisini incelemek amacıyla yapıldı.
Yöntem: Fizik tedavi doktoru tarafından çok seviyeli BT enjeksiyonu uygulanmış, 3-12 yaş arası, diplejik SP'li çocuklar dahil edildi. Çocukların BT enjeksiyon sayıları kaydedildi. Mobilite seviyesini belirlemek için kaba motor fonksiyon sınıflandırma sistemi (GMFCS) kullanıldı. Yürüme aktivitesi, Gilette Fonksiyonel Yürüyüş Anketi (Gilette) ile değerlendirildi. Selektif alt ekstremite motor kontrolü SCALE ile, Denge becerisi Pediatrik Berg Denge (PBD) Skalası ile değerlendirildi. İstatistiksel analiz için Spearman korelasyon analizi kullanıldı, $p<0.05$ anlamlı kabul edildi.
Sonuçlar: Rastgele seçilen yaş ortalaması 7±2,39 yıl olan 15 SP'li çocuğun enjeksiyon sayısı 1 ile 10 arasında değişmekteydi. En çok BT enjeksiyonu dokuz tekrar sayısı ile GMFCS level 3'teydi. BT tekrar sayısı ile diğer değerlendirmeler arasındaki ilişki r_{GMFCS} =0.425 r_{SCALE} =-0,424 , r_{PBB}=-0,357, $r_{Gilette}$=-0,337 oldu.
Tartışma: Mobilite seviyesi iyileştikçe BT tekrar sayısının azaldığı bulundu. BT tekrar sayısı ile alt ekstremite selektif motor kontrol skorları arasında orta düzeyde negatif yönde bir ilişki çıkarken denge ve yürüme becerileri ile zayıf negatif yönde bir ilişki bulundu.
Sonuç: BT enjeksiyonu mobilite ve lokomosyon seviyesi düşük olan çocuklarda daha çok yapılmaktadır. Selektif motor hareketi ve denge becerileri düşük olan çocuklarda BT sayısı da artmaktadır. Gelecekteki çalışmalarda daha çok örneklem grubunda BT tekrarlarından önce ve sonra selektif alt ekstremite kontrolü ve denge becerileri değişimi incelenmelidir.
Anahtar sözcüler: Botoks, serebral palsi, motor kontrol, denge

The relationship between the repetition of multi-level Botulinum Toxin Injection, mobility level, selective motor control of lower extremity, gait and balance in children with cerebral palsy

Purpose: Multi-level Botulinum Toxin (BT) injection is widely used in the treatment of spasticity in children with cerebral palsy (CP). It was aimed to investigate the relationship between the repetition of multi-level Botulinum Toxin Injection, mobility level, selective motor control of lower extremity, gait and balance in children with CP.
Methods: 3-12 years old children with diplegic CP, had multilevel BT injection was applied by a physician were included. The repetition numbers of injections were recorded. Gross Motor Function Classification System was used for mobility level. Walking activity was assessed with Gilette Functional Gait Assessment (Gilette). Selectivity was assessed with Selective Control Assessment of the Lower Extremity (SCALE), balance assessed with Pediatric Berg Balance (PBB). Spearman correlation analysis was used for statistical analysis and $p<0.05$ was considered significant.
Results: The mean age of randomly selected 15 children with CP was 7 ± 2,39 years. The number of injections ranged from 1 to 10. Maximum repetition was nine belonged to a child in GMFCS level 3. The relationship between the repetitions of BT and the assessments were r_{GMFCS} =0.425 r_{SCALE} =-0,424 , r_{PBB}=-0,357, $r_{Gilette}$=-0,337.
Discussion: It was found that the repetition of BT decreased as mobility level improved. While a moderate negative relationship was found between the number of BT repetition and lower extremity selective motor control, a poor negative relationship was found between repetition, gait and balance skills.
Conclusion: BT injection is more common in children with lower mobility and locomotion levels. The number of BT increases in children with decreased selective motor movement and poor balance skills. In future studies, selective lower extremity control and balance skills change should be investigated before and after BT repeats in the large sample group.
Key words: Botox, cerebral palsy, motor control, balance

S14 Obstetrik Brakial Pleksus Paralizisinde Raimondi El Fonksiyonları Sınıflama Sistemi İle Mini-Macs Değerleri Arasındaki İlişkinin Araştırılması

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Amaç: Obstetrik brakiyal pleksus paralizisi doğumda meydana gelen ve üst ekstremiteyi etkileyen sinir yaralanmasıdır. Raimondi El Fonksiyonları Sınıflama Sistemi (REFSS) OBPP'de el fonksiyonlarını değerlendirmek için sıkça kullanılmaktadır. Çalışmanın amacı Raimindi Sınıflama Sistemi ile serebral palsili hastaların el fonksiyonlarının sınıflanmasında kullanılan Mini-Macs'ın tutarlılığını araştırmaktı.
Gereç ve Yöntem: Çalışmaya OBPP tanısı konmuş 0-4 (Ortalama 18,01±10,75 ay) yaş aralığında 82 çocuk dahil edildi. Çocukların el fonksiyonları fonksiyonel aktiviteler sırasında gözlem ile REFSS ve Mini-Macs ile değerlendirildi. Sınıflama yöntemleri aynı araştırmacı tarafından aynı gün içerisinde yapıldı. REFSS ile Mini-Macs'ın tuarlılığı için pearson korelasyon analizi kullanıldı.
Sonuçlar: REFSS ile Mini Macs arasında mükemmel ilişki bulundu (r= - 0,904, p= 0,0001).
Tartışma: OBPP'de REFFS sistemi el fonksiyonlarının sınıflamasında yaygın olarak kullanılmaktadır. REFFS sistemi el fonksiyonunu aktif normal eklem hareketlerine göre sınıflarken, Mini-Macs el fonksiyonu aktivite sırasında hareketin kalitesi ile sınıflandırmaktadır. Bu nedenle OBPP'de el fonksiyonlarının sınıflamasında Mini-Macs sisteminin de kullanılabileceğini düşünüyoruz.
Anahtar Kelimeler: OBPP, El Fonksiyonu

The Investigation of the Relationship Between Raimondi Hand Functions Classification System and Mini-Macs Values in Obstetric Brachial Plexus Paralysis

Objective: Obstetric brachial plexus paralysis (OBPP) is a nerve injury that occurs at birth and affects the upper extremity. The Raimondi Hand Functions Classification System (REFSS) is frequently used to evaluate hand functions in OBPP. The aim of

the study was to investigate the consistency of Raimondi Classification System with Mini-Macs which used in the classification of hand functions of patients with cerebral palsy.
Materials and Methods: Eighty-two children aged between 0-4 (mean 18.01 ± 10.75 months) with OBPP were included to the study. The hand functions of the children were evaluated with REFSS and Mini-Macs by observation during functional activities. Same researcher performed the assessments on the same day. Pearson correlation analysis was used for determining the consistency of Mini-Macs with REFSS.
Results: The relationship between REFSS and Mini Macs was found to be excellent (r = - 0.904, p = 0.0001).
Discussion: The REFFS system in OBPP was widely used in the classification of hand functions. The REFFS system classifies hand function according to active normal joint movements, while the Mini-Macs classifies hand function by the quality of the movement during activity. Therefore, we think that Mini-Macs system can be used in the classification of hand functions in OBPP.
Keywords: OBPP, Hand Function

S15 Nöromotor Gelişimi Değerlendiren Testlerden İnfant Motor Profile ve Alberta Infant Motor Skala Arasındaki İlişkinin İncelenmesi

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Amaç: Prematüre bebeklerin erken dönemde nörogelişimsel olarak değerlendirilmesi, atipik bulguların erken dönemde tespit edilerek riskli bebeklerin erken müdahale programlarına yönlendirilmesi ve takibi için gereklidir. Çalışmamızda prematüre bebeklerde nöromotor gelişimi değerlendiren test bataryalarından Infant Motor Profile (IMP) ve Alberta Infant Motor Skala'nın alt bölümlerinin birbiri ile ilişkisi araştırıldı.
Gereç ve Yöntem
Düzeltilmiş yaşı 4, 8 ve 12 ay olan 61 prematüre bebek IMP ve AIMS test bataryaları ile değerlendirildi. IMP'in alt bölümleri olan hareket çeşitliliği, performans, akıcılık, simetri ve hareket adaptasyonu ile AIMS'nın yüzüstü, sırtüstü, oturma ve ayakta durma puanınlarına ait korelasyon değerleri ve faktör analizi sonuçları SPSS 21.0 istatistik paket programı ile değerlendirilmiştir.
Sonuçlar: Faktör 1'in altında bir arada bulunan IMP hareket çeşitliliği, IMP performans ve AIMS alt bölümleri kaba motor gelişimi ifade eden, bebeğin hareketi yapabilmesini değerlendiren alt bölümlerdir. Faktör 2'nin altında bir arada bulunan IMP akıcılık, IMP simetri bebeğin yapabildiği hareketlerin kalitesini değerlendiren alt bölümlerdir. Sonuç olarak; Yapılan faktör analizi ile motor becerilerin, IMP ve AIMS'in ortak değişkeni olduğu, IMP'in farklı olarak bebeğin hareket kalitesini de değerlendirdiği görülmüştür. Bu nedenle prematüre bebeklerde kaba motor hareketleri ve hareketin kalitesini değerlendiren testlerin birlikte kullanılması önemlidir.
Tartışma: IMP alt bölümleri ve AIMS alt bölümlerinin faktör analizi yapılmış ve toplam varyans %77,792 olarak bulunmuştur. Faktör 1'in IMP hareket çeşitliliği, performans ve tüm AIMS alt bölümlerini, Faktör 2'nin ise IMP akıcılık, simetri skorunu içerdiği görülmüştür. IMP hareket çeşitliliği, IMP performans ve tüm AIMS alt bölümleri arasında güçlü bir ilişki olduğu da bulunmuştur.
Investigation of the Relationship Between Infant Motor Profile and Alberta Infant Motor Scale Among Tests Evaluating Neuromotor Development
Purpose: Early neurodevelopmental evaluation of premature infants is necessary for early detection of atypical findings and for directing and monitoring the risky infants for early intervention programs. In our study, the relationship between Infant Motor Profile (IMP) and Alberta Infant Motor Scale sub-sections were investigated.
Materials and Methods: 61 prematurity babies with corrected age of 4, 8 and 12 months were evaluated with IMP and AIMS tests. The sub-sections of IMP performance, variation, fluency, symmetry and adaptation, and the correlation values of AIMS for prone, supine, sitting and standing scores and factor analysis results were evaluated with SPSS 21.0 statistical package program.
Results: Factor analysis that contained IMP subscales, NSMDA Total and AIMS subscales was performed and total variance explained was 77,792%. Factor 1 contains IMP variation, IMP performance and all AIMS subscales. And Factor 2 contains IMP fluency, IMP symmetry. It has also been found that there is a strong relationship between IMP motion diversity, IMP performance and all AIMS subdivisions.
Discussion: Within factor 1 that evaluate the ability of the baby to perform movement, expressing gross motor development. Within factor 2 that assess the quality of movements that baby can do. As a result; Factor analysis showed that motor skills are a common variable of IMP and AIMS, and IMP evaluated the quality of motion of the baby unlike AIMS. For this reason, it is important to use the tests together that evaluate the motor movements and quality of movement in premature babies.

POSTER BİLDİRİ LİSTESİ / Poster Presentations

No	Başlık	Title	Yazarlar / Authors	Sunucu Ad Soyad Presenter's name
P01	Stereotipik Hareket Bozukluğu ve Tourette Sendromu	Differences Between Stereotypic Movement Disorder and Tourette	Abdulah Furkan CANGİ1, Nur Tuba	Abdulah Furkan CANGİ

	Arasındaki Farklar: Literatür taraması	Syndrome	ALTINORDU2	
P02	Stereotipik Hareket Bozukluğu ve Kognitif problemlerle İlişkisi	Relation Between Stereotypic Movement Disorder and Mental Retardation	Abdulah Furkan CANGİ1, Nur Tuba ALTINORDU2	Nur Tuba ALTINORDU
P03	Joubert Sendromlu Bir Hastada Bobath Terapisinin Etkisi: Olgu Sunumu	The Effect Of Bobath Therapy In A Patient With Joubert Syndrome: A Case Report	Elif Dilan ATILGAN[1], Ayşenur TUNCER[2], Kezban BAYRAMLAR[2]	Elif Dilan ATILGAN
P04	Wolf Hirshhorn Sendromunda Bobath Yaklaşımı-Olgu Sunumu	Bobath Approach to Wolf Hirshhorn Syndrome-Case Report	Zekiye GEZGİN*, Cem GEZGİN*	Zekiye GEZGİN
P05	Stereotipik Hareket Bozukluğu ve Duyusal Süreçler Arasındaki İlişkiler	Relationship Between Stereotypic Movement Disorder and Sensory Processes	Abdulah Furkan CANGİ1, Nur Tuba ALTINORDU2	Nur Tuba ALTINORDU
P06	Sosyoekonomik ve Demografik Özelliklerin Serebral Palsi	The Effect of The Socioeconomic and Demographic Properties on Quality of Life of Families of Children with Cerebral Palsy: Research Article	Mehmet ALTUN1 Hasan BİNGÖL2 , Hikmet KOCAMAN3	Hasan BİNGÖL
P07	Serebral Palsili Çocukların Ebevynlerinin Tedaviye Katılımı ve Bakım Vermenin Yaşamlarına Etkileri	The comparison of participation of parents to treatment and the effeckt of caregiving to their life in cerebral palsy	Hilal DENİZOĞLU KÜLLİ 1 , Elif DURGUT2, Şefika POLAT3	Şefika POLAT
P08-				
P09	Pediatrik Rehabilitasyon'da Kısıtlayıcı-Zorunlu Hareket Terapisi (KZHT) ve Nöroplastisite Oluşumunu; İşlevselliğin Uluslararası Sınıflandırması (ICF) ile Bütünleştirme	Integration of Contraint Induced Movement Therapy (CIMT) and Neuroplasticity innternational Classification of Functioning Disability and Health (ICF) with Pediatric Rehabilitation	Amine KALKAN(1), İremnur SOYLU(2), Muammer AYDOĞDU (2)	Amine KALKAN
P10	Hemiparatik serebral palsili çocuklarda ayak bileğine uygulanan elastik bant ile rijit bantlamanın denge ve kaba motor fonksiyonlara etkisinin karşılaştırılması	Comparison of the effects of elastic taping and rigid taping on the ankle on balance and gross motor functions in children with hemiparatic cerebral palsy	Rıdvan GÖK, Duygu KORKEM[2], Yasemin ÇIRAK[3]	Rıdvan GÖK
P11	Gelişimsel Koordinasyon Bozukluğu Olan Çocuklarda COPM Temelli CO-OP(Günlük Mesleki Performansa Bilişsel Oryantasyon) Yaklaşımının Etkisi:Metaanaliz	The Effect of COPM Based CO-OP (Cognitive Orientation of Daily Occupational Performance) Approach in Children with Developmental Coordination Disorders	İremnur SOYLU (1), Amine KALKAN (2),Muammer AYDOĞDU (3)	İremnur SOYLU
P12	Serebral palsili diplejik çocuklarda denge becerileri ve alt ekstremite hareketleri arasında herhangi bir ilişki var mıdır?	Is there any relationship between balance skills and lower extremity movements in diplegic children with cerebral palsy	Zana Gergi, Mintaze Kerem Günel, Kübra Seyhan, Fatma Gül Şener	Zana GERGİ

P01 Stereotipik Hareket Bozukluğu ve Tourette Sendromu Arasındaki Farklar: Literatür taraması

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Amaç: Stereotipik hareket bozukluğu ile Tourette sendromu arasındaki ilişkiyi incelemektir.
Gereç ve Yöntem: Makale taraması yaparken PubMed, Frontiers, Researchgate veri tabanları ve AJOT dergisi kullanılmıştır.

Bulgular-Sonuçlar: Stereotipik hareket bozukluklarına tanı koyarken, alışkanlıklar, günlük davranışlar, motor tikleri, obsesif-kompulsif davranışlar ve paroksismal diskineziler gibi normal davranışlar ve diğer bozukluklardan ayırmamız gerekmektedir. En sık gördüğümüz ise stereotipilerin, tikler olarak yanlış teşhis edilmesidir. Her ikisi de aynı bireyde meydana gelme ihtimali olsa da bu iki tanıyı ayırt etmek için birkaç özellik bilinmektedir. Stereotipiler 2-3 yıldan daha önce başlarken, tiklerin başlangıç süresi 6-7 yıldır. Vücut lokasyonu açısından, stereotipiler genellikle kollar, eller veya tüm vücudu içerirken; tikler gözler, yüz ve baş çevresi, omuz bölgelerini içerir. Ayrıca stereotipiler, daha sabit, ritmik ve uzun süreliyken; tikler kısa, hızlı, anlık ve dalgalanma gösterirler.
Tartışma: Her ikisi de anksiyete, heyecan veya yorgunluk dönemlerinde ortaya çıkar, ancak çocuk bir aktivite içine daldığında stereotipik hareketler durmaya daha yatkındır. Tikler ve stereotipik hareketlerin her ikisi de aktivite uğraşlarıyla azalmaktadır.

Differences Between Stereotypic Movement Disorder and Tourette Syndrome: Investigation Literature
Purpose: To investigate the literature about the relationship between stereotypic movement disorder and Tourette's syndrome and compile the researches and make the reports.
Materials and Methods
PubMed, Frontiers, Researchgate databases and AJOT journal were used for article review.
Results: When diagnosing stereotypic movement disorders, it is necessary to distinguish habits, daily behaviors, motor tics, obsessive-compulsive behaviors, and paroxysmal dyskinesia from normal behavior and other disorders. What we see most often is that stereotypes are misdiagnosed as tics. Although both are likely to occur in the same individual, several features are known to distinguish these two. Stereotypes begin 2-3 years ago, while the start of the tics is 6-7 years.In terms of body location, stereotypes often include arms, hands or the entire body; tics include eyes, face and head circumference, shoulder areas. Furthermore, stereotypes are more stable, rhythmic and long-lasting; tics show short, fast, instant and fluctuate.
Discussion: Both occur during periods of anxiety, excitement or fatigue, but stereotyped movements tend to stop when the child falls into an activity. Both ticks and stereotypic movements are diminished by meaning occupational activities.

P02 Stereotipik Hareket Bozukluğu ve Kognitif problemlerle İlişkisi

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Amaç: Stereotipik hareket bozukluğu ile kognitif problemler arasındaki ilişkiye dair literatür taraması yapmaktır.
Gereç ve Yöntem: Makale taraması yaparken PubMed, Frontiers, Researchgate veri tabanları ve AJOT dergisi kullanılmıştır.
Bulgular-Sonuçlar: Otizmde tekrarlayan davranışların ortaya çıkmasının, bilişsel yetenek düzeyiyle ilişkisi olabileceğine dair birçok çalışma yapılmıştır. Bu çalışmalar doğrultusunda otizmli bireylerin kognitif problemleri olan bireylerden daha yüksek düzeyde stereotipi yoğunluğunu olduğu ortaya çıkmıştır. Otizmde kognitif problemleri karşı tekrarlanan davranışların tipi, sıklığı ve şiddeti değişkenlik gösterebilir. Özellikle Otizm ve kognitif problemlerin şiddetinin arttığı vakalarda Stereotipi fiziksel ve duygusal hasarlara sebep olabilir. Örneğin başı duvarlara vurma, saç koparma, kendisine ve başkalarına fiziksel zarar verme gibi.
Tartışma: Bu örnekler Otizm ve kognitif problemlerin seviyeleriyle birlikte yaş, cinsiyet, çevresel etmenlerden de etkilenerek değişkenlik gösterebilirler.

Relation Between Stereotypic Movement Disorder and Cognitive problems
Purpose: To investigate the literature about the relationship between stereotypic movement disorder and Tourette's syndrome and compile the researches and make the reports.
Materials and Methods
PubMed, Frontiers, Researchgate databases and AJOT journal were used for article review. PowerPoint Office product was used during poster preparation.
Results: Many studies have been done on the occurrence of repetitive behaviors in autism, which may be related to the level of cognitive ability. In the context of these studies it has been found that autistic individuals have a higher stereotype density than individuals with cognitive problems. The type, frequency and severity of repetitive behaviors to cognitive problem in autism may vary. Stereotypes can cause physical and emotional damage, especially in cases of increased autism and cognitive problems For example, tapping on the head walls, hair breakage, physical damage to yourself and others.
Discussion: These examples may vary with the severity of autism and cognitive problem, as well as age, gender, and environmental factors.

P03 Joubert Sendromlu Bir Hastada Bobath Terapisinin Etkisi: Olgu Sunumu

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Amaç: Joubert sendromu (JS), otozomal resesif geçiş gösteren, serebellar vermisin kısmi ya da tam yokluğu ile karakterize bir hastalıktır. Klinik bulguları arasında hipotoni, ataksi, anormal solunum paterni, anormal göz hareketleri, nistagmus ve motor-mental retardasyon yer alır. Bu çalışmanın amacı, JS tanılı hastada nörogelişimsel tedavi yaklaşımı olan Bobath terapisinin

sonuçlarını incelemektir.
Gereç ve Yöntem: Altı aylık olguya haftada 3 gün 45 dakika Bobath terapisi uygulanmış ve ailesine hastaya evde uygulanmak üzere fonksiyonel, motor gelişimi destekleyici egzersizler ve pozisyonlamalar öğretilmiştir. Başlangıç ve 2 yıllık tedavi sonucundaki gelişim Kaba Motor Fonksiyon Ölçütü (GMFM-88), Kaba Motor Fonksiyon Sınıflandırma Sistemi (GMFCS), Pediatrik Özürlülük Değerlendirmesi (PEDİ) ve Pediatrik Fonksiyonel Bağımsızlık Ölçütü (Wee-FIM) kullanılarak değerlendirilmiştir. Ayrıca olgunun annesinin kaygı düzeyini değerlendirmek için Spielberger'in Sürekli-Durumluk Kaygı Envanteri (STAI) kullanılmıştır.
Bulgular-Sonuçlar: Başlangıçta başını tutamayan ve yardımla kendi etrafında dönebilen hasta 2 yıllık tedavi sonucunda desteksiz yürüyebilir duruma gelmiştir. GMFM-88 total skoru %2,8'den %79,5'e çıkmıştır. GMFCS seviyesinin ilk değeri 5 iken son değeri 1 olmuştur. Wee-FIM toplam skoru 18'den 49'a ve PEDİ 3'ten 123'e ulaşmıştır. Ayrıca annenin durumluk ve sürekli kaygı puanları başlangıçta sırasıyla 46 ve 63 iken, tedavi sonunda 44 ve 55 olarak saptanmıştır.
Tartışma: JS'li hastanın Bobath terapisinden yarar sağladığı ve hastadaki gelişmelerin annenin kaygı düzeyine olumlu etkilediği görülmüştür.

The Effect Of Bobath Therapy In A Patient With Joubert Syndrome: A Case Report
Purpose: Joubert syndrome (JS) is an autosomal recessive disorder characterized by partial or complete absence of cerebellar vermis. Clinical symptoms are hypotonia, ataxia, abnormal respiratory pattern, abnormal eye movements, nystagmus, and motor-mental retardation. The aim of this study was to examine the results of the Bobath therapy of a patient with the diagnosis of JS.
Materials and Methods: 6 months old patient was treated with Bobath Therapy for three days/week with 45 minutes sessions. Functional, motor development exercises and positioning were instructed to the family. Development at baseline and after two years was assessed by using Grosss Motor Function Measure (GMFM-88), Gross Motor Function Classification System (GMFCS), Pediatric Evaluation of Disability Inventory (PEDI) and Pediatric Functional Independence Measure (Wee-FIM). Furthermore, the mother of the patient was evaluated with State–Trait Anxiety Inventory (STAI).
Results: The patient, initially unable to hold her head and able to turn around with support, has been able to walk without support after the treatment. The total score of GMFM-88 was increased from 2,8% to 79,5%, GMFCS decreased from 5 to 1, Wee-FIM total score increased from 18 to 49 and PEDI increased from 3 to 123. The mother's STAI scores were respectively decreased from 46 to 44 and 63 to 55.
Discussion: The patient with JS is observed to benefit from Bobath Therapy and patient developments had a positive effect on anxiety of the mother.

P04 Wolf Hirshhorn Sendromunda Bobath Yaklaşımı-Olgu Sunumu

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Amaç: Prenatal takiplerinde intrauterin gelişme geriliği ile sendromik bulguları tespit edilen kız olgu, 37 hafta 4 günlük iken, sezeryan ile, 1590 gram olarak doğmuştu. Düşük doğum kilosu, beslenme güçlüğü, bilateral pes ekinovarus nedeniyle yenidoğan yoğun bakım servisinde 45 gün takip edilmişti. Wolf Hirshhorn Sendromu tanılı vakamızda 3 aylıkken terapiye başlandı.
Gereç ve Yöntem: Olgunun motor profili, Infant Motor Profil (IMP) ile; motor repertuarı Assessment of Motor Repertoire (AMR-3 to5 months) ile; Duyusal fonksiyonları Bebeklerde Duyusal Fonksiyonları Değerlendirme ölçeği (DFD) ile değerlendirildi. Olgumuza 12 hafta boyunca Bobath Nörogelişimsel Terapi (NGT) uygulandı. Baş ve gövde kontrolünü fasilite edici çalışmalara ek olarak, yeme-yutma, göz takibi ve ağırlık aktarma çalışmaları yapıldı. Aile eğitimi verildi. Evde bakımını kolaylaştıran uygulamalar ve transfer pozisyonları gösterildi.12. Haftanın sonunda tekrar değerlendirildi.
Bulgular-Sonuçlar: Olgumuz gibi sendromik doğan bebeklerde, eşlik eden sağlık problemleri sebebiyle, fizyoterapi yaklaşımları ikinci planda kalmaktadır. Oysa, erken dönemde Bobath (NGT)gibi holistik gelişim desteği ile bebeğin gelişimi ve aile ile beraber yaşama katılımı kolaylaştırılabilir.
Tartışma: 12 haftalık uygulama sonrası olgunun postür ve hareket kalitesinin arttığı IMP ve AMR sonuçlarından anlaşılmıştır.(Tablo1-2) Bunlara ek olarak; göz takibinin artması, sosyal gülümsemesinin başlaması, kaşıkla beslenmesi ve bardaktan içmesi dikkat çekicidir.

Bobath Approach to Wolf Hirshhorn Syndrome-Case Report
Purpose: The female case with Wolf Hirschhorn Syndrome was born 1590 grams with intrauterine developmental delay and syndromic findings at 37 weeks 4 days with caesarean section. She was followed for 45 days in the neonatal intensive care unit due to her low birth weight, nutritional difficulty and bilateral pes equinovarus. Therapy was started in postnatal third month.
Materials and Methods
Motor profile of the case was assessed by Infant Motor Profile (IMP), motor repertoire by Assessment of Motor Repertoire (AMR-3 to 5 months) and sensory functions were assessed by the Infantile Functional Assessment Scale (DFD). Bobath Neurodevelopmental Therapy (NGT) was performed for 12 weeks. In addition to head and trunk control exercises, oromotor therapy, eye-tracking and weight transfer exercises were conducted additionally to family education including positioning. At the end of 12th week the assessment tests were performed.
Results: At the end of 12 week posture and movement quality scores of IMP and AMR were increased (Table 1-2). And social interaction signs such as increased eye contact and eyesight, social smile developed and feeding with spoon and drinking from the cup was remarkable.
Discussion: Just physiotherapy approaches for children with Wolf Hirschhorn Syndrome may remain limited and early holistic approaches enriched with family education such as Bobath (NDT) can facilitate the development and participation of the baby

and family.

P05 Stereotipik Hareket Bozukluğu ve Duyusal Süreçler Arasındaki İlişkiler

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Amaç: Stereotipik hareket bozukluğu ile duyusal süreçler arasındaki ilişkiyi incelemektir.
Gereç ve Yöntem: Makale taraması yaparken PubMed, Frontiers, Researchgate veri tabanları ve AJOT dergisi kullanılmıştır.
Bulgular-Sonuçlar: Beyin olgunlaştıkça duyusal bilgiyi karmaşık hareketler üretmesine izin veren motor davranışlar geliştirir. Fakat zayıf duyusal entegrasyon motor becerilerin esnek ve etkili kullanılmasını engeller ve hareketleri basit kalıplaşmış davranışlarla sınırlandırır. Çalışmalarda stereotipik hareketlerin bakıcılar tarafından sağlanan vestibüler (sallanma, zıplama, vb.) girdinin miktarı ile ters orantılı olduğu ve daha az vestibüler girdi alan bebeklerde stereotipilerin sürdüğü saptanmıştır. Stereotipi sıklığı, bebeğin serbestçe dolaşmasına izin verilen zamana kıyasla, hareket özgürlüğü kısıtlandığında daha da artmıştır. Yapılan bir takım çalışmalarda beynin duysal girdiler ve motor deneyimlerle desteklenmesi stereotipik hareket bozukluğunu başarıyla azalttığı görülmüştür. Stereotipik hareket bozukları ve duyusal sistemlerle ilişkisi üzerine ülkemizde ve dünya literatüründe yeterli bilgi ve çalışmalar bulunmamakla birlikte son yıllarda literatüre stereotipiye duyusal müdahaleler ve sonuçları üzerine çalışmalar eklenmektedir. Fakat hala duyuyla ilişkisi konusunda yeterli düzeyde bilgi bulunmamaktadır.
Tartışma: Literatüre eklenen son çalışmalara göre duyusal tekniklerin ve yaklaşımların stereotipik hareket bozukluğuna çözüm getirebileceğine dair umut vadetmektedir. Bu alandaki bilgi eksikliklerinin giderilmesi terapi ve rehabilitasyon süreçlerini olumlu etkileyerek bireyin yaşam kalitesini ve iyi olma halini artırabilir.

Relationship Between Stereotypic Movement Disorder and Sensory Processes
Purpose: To investigate the correlation about the relationship between stereotypic movement disorder and Tourette's syndrome and compile the researches.
Materials and Methods: PubMed, Frontiers, Researchgate databases and AJOT journal were used for article review.
Results: As the brain matures, it develops motor behaviors that allow sensory information to produce complex movements. But weak sensory integration prevents the flexible and effective use of motor skills and limits movements to simple stereotypes. In studies, stereotypic movements were found to be inversely proportional to the amount of vestibular input provided by caregivers, and stereotypes continued in infants who received less vestibular input. The frequency of the stereotype increased even more when the freedom of movement was restricted compared to the time when the baby was allowed to roam freely. Although there is not enough information and studies about stereotypic movement disorders and their relationship with sensory systems in our country and in the world literature, studies on sensory interventions and their results are added to the literature in recent years. But there is still not enough information about the relationship to the senses.
Discussion: According to recent studies added to the literature, it is promising that sensory techniques and approaches can solve the stereotypical movement disorder. Eliminating the knowledge deficiencies in this area can positively affect the therapy and rehabilitation processes and can increase the quality of life and well-being of the individual.

P06 Sosyoekonomik ve Demografik Özelliklerin Serebral Palsi'li Bireylerin Ebeveynlerinin Yaşam Kalitesine Etkisi: Araştırma Makalesi

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Amaç: Bu çalışmanın amacı sosyoekonomik ve demografik özelliklerin Serebral Palsi'li çocukların ebeveynlerinin yaşam kalitesi üzerindeki etkisini incelemektir
Gereç ve Yöntem: Çalışmaya İstanbul Gaziosmanpaşa ilçesinde faaliyet gösteren sekiz farklı özel eğitim ve rehabilitasyon merkezinde ayakta tedavi edilen 100 Serebral Pals'li hastanın annesi dahil edildi. Katılımcıların yaşam kaliteleri Kısa Form-36 ile ölçüldü. Sosyoekonomik ve demografik özellikler ise Sosyoekonomik ve Demografik Durum Anketi ile değerlendirildi.
Bulgular-Sonuçlar: Serebral Palsi'li hasta annelerinin yaşam kalitesi birçok sosyokültürel ve demografik faktörden etkilenmektedir.
Tartışma: Fiziksel engelli çocuk sayısı birden fazla olan katılımcıların sadece bir fiziksel engelli çocuğu olanlara göre yaşam kalitesinin ağrı boyutu ve mental sağlık boyutu puanları daha düşüktü ($p<0,05$). Katılımcıların aylık gelir durumuna göre oluşturulan gruplar yaşam kalitesi açısından karşılaştırıldığında, yaşam kalitesinin vitalite alt boyutu hariç tüm alt boyut puanları arasında anlamlı fark bulundu ($p<0,05$). Katılımcılardan çekirdek aile yapısına sahip olanların geleneksel aile yapısına sahip olanlara göre yaşam kalitelerinin ağrı boyutu, genel sağlık algısı boyutu, vitalite boyutu, ruhsal sağlık boyut puanları anlamlı derecede daha yüksekti ($p<0,05$). Katılımcıların çocuklarının serebral palsinin tipine göre oluşturulan gruplar arasında yaşam kalitesi alt boyutlarından genel sağlık algısı, vitalite, emosyonel rol güçlüğü ve mental sağlık puanları açısından anlamlı fark bulundu ($p<0.05$).

The Effect of The Socioeconomic and Demographic Properties on Quality of Life of Families of Children with Cerebral Palsy: Research Article
Purpose: The purpose of this study is to investigate the effects of socioeconomic and demographic properties on quality of life in families of cerebral palsy children
Materials and Methods: A total of 100 mothers of children with cerebral palsy from eight different special education and

rehabilitation center in Gaziosmanpasa district in Istanbul were enrolled in this study. The participants' quality of life were measured with the Short Form-36 and the socioeconomic and demographic properties were evaluated through Socioeconomic and Demographic Situation Survey Tools
Results: The pain dimension and mental health dimension of the mothers with more than one child with physical disability was lower than the mothers with one disabled child (p < 0,05). When groups formed according to monthly incomes were compared in terms of quality of life, a significant difference was found between all the bottom score except for the bottom score of vitality (p < 0,05). The score of pain, general health perception , vitality and mental health in the participants with nuclear families were significantly higher than those with traditional families (p < 0,05). Between the groups formed according to cerebral palsy types, a significant difference was revealed in terms of general health perception, vitality, emotional role difficulty and mental health status (p < 0,05).
Discussion: The quality of life of the mothers of children with cerebral palsy are affected by a number of sociocultural and demographic factors.

P07 Serebral Palsili Çocukların Ebevynlerinin Tedaviye Katılımı ve Bakım Vermenin Yaşamlarına Etkileri

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Amaç: Serebral Palsili (SP) çocuklara sahip ebeveynlerin, ev programlarına katılım oranlarını ve SP'li bir çocuğa bakım vermelerinin yaşamlarına etkilerini karşılaştırmayı amaçlamaktadır.
Gereç ve Yöntem: Çalışmaya 10 SP tanılı çocuğun ebeveyni dahil edilmiştir. Ebeveynlerin demografik özellikleri değerlendirme formu yoluyla kayıt altına alınmıştır. Ebeveynlerden ev programına katılımlarını 0 ila 100 arasında puanlanan lineer skorlama üzerinde işaretlemeleri istenmiştir. Bakım vermenin etkisi Bakas Bakım Veren Etki Ölçeği, yaşam kalitesi SF-36 (kısa form) ile, ebeveynlerin uyku kalitesi Pittsburgh Uyku Kalite İndeksiyle, depresyon ve umutsuzluk ise Beck Depresyon ve Umutsuzluk Ölçeği ile değerlendirilmiştir.
Bulgular-Sonuçlar: Bobath tedavi yaklaşımında SP'li çocukların ebeveynlerinin ev programı kapsamında ve tüm günlük yaşamları içinde tedaviye uyumlu yaklaşımlar sergilemesi gereklidir. Çalışmamız babaların ev programlarına katılımlarının annelere göre düşük olduğunu gösterirken katılım oranındaki farkın ebeveynlerin yaşamlarındaki etkilerine yansımadığı görülmüştür. Çalışmamızın sonuçları, Fizyoterapi rehabilitasyon programlarında Bobath yaklaşımına uygun tutuş, pozisyonlama ve fasilitasyonların günlük yaşam içinde kullanımlarına özgü ebeveyn eğitimi, çocuğun mental ve fonksiyonel durumuna uygun oyun ve oyuncak seçimi ve tedavi süreci içinde verilen eğitimler doğrultusunda tekrarlanması gerekliliği ortaya çıkmaktadır.
Tartışma: Çalışmamızın sonuçlarına göre iş yaşamı sebebiyle annelerin babalardan daha çok evde vakit geçirdikleri tespit edilmiştir. Anne ve babaların ev programına katılımları sırasıyla ortalama %74.4 ve %21.1 idi ($p < 0.05$). Bakas bakım veren etki ölçeği, yaşam ve uyku kalitesi, depresyon ve umutsuzluk değerlendirmelerinde ise anlamlı bir fark saptanmamıştır.

The comparison of participation of parents to treatment and the effeckt of caregiving to their life in cerebral palsy
Purpose: The aim of our study is to compare participation of parents with cerebral palsy child tohome exercise programme and effects of care for a child with CPontheir lifes.
Materials and Methods: 10 parents of children with CP were participated to study.demographic characteristics of the parents were recorded by an assessment form. Parents were asked to mark their participation to home exercise program on a linear scoring, which is scored from 0 to 100.effect of caregiving was assessed by Bakas Caregiving Outcomes Scale, quality of life were evaluated by SF-36 (short form), the sleep quality ofparents were determined by Pittsburgh Sleep Quality Index, and depression and hopelessness were sceeened by Beck Depression and Hopelessness Scale.
Results: results of our study showed that mothers spend more time at home than fathers because of work (p < 0.05).participations of mothers and fathers to home exercise program were 74.4% and 21.1%, respectively (p
Discussion: parents of children with CP should be able to follow basis of Bobath approach within home exercise programme and also within daily lifes. Our study showed that participations of fathers to home exercise programmes are lower than mothers, these difference do not reflect on their other parameters. According to our results, physiotherapy and rehabilitation programmes should include and frequently repeat education of handling techniques, positioning and facilitations,rigth choice of games and toys to children with CP.

P09 Pediatrik Rehabilitasyon'da Kısıtlayıcı-Zorunlu Hareket Terapisi (KZHT) ve Nöroplastisite Oluşumunu; İşlevselliğin Uluslararası Sınıflandırması (ICF) ile Bütünleştirme

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Amaç: Pediatrik rehabilitasyonda Kısıtlayıcı-Zorunlu Hareket Terapisi' nin ICF bakış açısıyla analiz edilmesi amaçlanmıştır.
Gereç ve Yöntem
Kısıtlayıcı Zorunlu Hareket Terapisi (KZHT)'nin pediatrik rehabilitasyonda etkinliğini araştıran çalışmalar analiz edilip derlenmiştir.
Bulgular-Sonuçlar: Fonksiyonel üst ekstremite hareketinin kısıtlanması erişkinlerde uygulanabilirken, çocuklarda uygulanması tartışmalıdır. Özellikle hızlı büyüme döneminde sağlam kolu kısıtlamanın bimanuel ve dominant elde fonksiyon kaybına sebep olabileceği ifade edilmektedir.

Tartışma: Kısıtlayıcı-Zorunlu Hareket Tedavisi (KZHT) temel nörobilim ve primatlar üzerinde yapılmış davranış çalışmalarından temel alan bir rehabilitasyon yaklaşımıdır. KZHT: "öğrenilen kullanmama" ve "kullanıma bağlı kortikal reorganizasyon" ile açıklanır. Hemiparezili çocuklarda etkilenmiş üst ekstremitede ''öğrenilmiş kullanmama'' yerine ''gelişimsel yok sayma'' tanımlaması kullanılır. KZHT uygulamasının temel komponentleri ; 1. Şekillendirme , 2. Günlük yaşam aktivitelerine aktarma , 3. Etkilenen ekstremitenin günün %90'ında kullanımı: International Classification of Fonctioning, Disability and Health (ICF) bakış açısıyla etkilenmiş vücut fonksiyonuna yapılan müdahale, çocuğun günlük yaşamında rol ve görevlerinin içine doğal bir dağılımla, etkilenmiş ekstremitenin sık kullanımı yani 'katılımı' ile paralellik göstermektedir. Yapılan müdahalelerin çocuğun aktivitesi olan oyunun içine yerleştirilmesi ve temel kompenentlerin fonksiyonel kapasiteyi arttıracak stratejiler içermesi KZHT ve ICF uyumunu göstermiştir. Sonuç olarak; etkilenmiş ekstremitenin kullanımıyla motivasyon artar, pozitif pekiştireç sağlanır, daha çok pratikle kortikal reorganizasyon ve nöral bağlantıların güçlenmesiyle öğrenilmiş kullanmamanın üstesinden gelinir.

Integration of Contraint Induced Movement Therapy (CIMT) and Neuroplasticity innternational Classification of Functioning Disability and Health (ICF) with Pediatric Rehabilitation

Purpose: The aim of this study is to analyze the Contraint Induced Movement Therapy (CIMT) and in pediatric rehabilitation from an ICF point of view.
Materials and Methods: CIMT was analyzed and compiled from studies investigating the efficacy of pediatric rehabilitation work.
Results: CIMT, is a rehabilitation approach based on behavioral studies on basic neuroscience and primates.CIMP: It can be explained with " learned disuse" and " use-dependet medical cortical reorganization". In children with hemiparesis, the term "developmental ignore" is used instead of "learned disuse". Components of CIMT; 1.Formalizing, 2.Transferring into daily life activities, 3. Usage of the affected extremity by %90 of the day: interventions to the affected body function by the perspective of ICF have paralles with the frequent use, in other words incorpoation, of the affected extremity with a natural dispersion into the roles and duties of the child in hisher daily life. The fact that the interventions are involved in the games , which are the activities of the child , and the basic components include the strategies that would increase the functional capacity has shown the compliance of CIMT and ICF. Eventual, the motivation increases with the usage of the affected extremity, positive reinforcement is provided and the learned disuse is overcome with neural connections and cortical reorganization goining strength with more practice.
Discussion: While the restriction of the functional upper extremity can be applied to adults, its usage whith children should be discussed.

P10 Hemiparatik serebral palsili çocuklarda ayak bileğine uygulanan elastik bant ile rijit bantlamanın denge ve kaba motor fonksiyonlara etkisinin karşılaştırılması

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Amaç: Bu çalışmanın amacı hemiparetik serebral palsi tanılı çocuklarda ayakbileğine uygulanan farklı bant uygulamalarının denge ve kaba motor fonksiyonarına etksini incelemektir.
Gereç ve Yöntem: Çalışmaya, Özel Çocuk Terapisi Özel Eğitim ve Rehabilitasyon Merkezi'nden 2-16 yaşlarındaki 24 hemiparetik spli çocuk dahil edildi. Çocukların fonsiyonel seviyeleri Kaba Motor Fonksiyon Sınıflandırma Skalası (KMFSS), motor seviyeleri ise Kaba Motor Fonksiyon Ölçümü-88 (KMFÖ-88) ile değerlendirildi. Fonksiyonel dengelerini değerlendirmek için Pediatrik Berg Denge Ölçeği (PBDÖ) kullanılırken mobilite seviyeleri Zamanlı Kalk ve Yürü Testi (TUG) ve 2 dakika yürüme testi ile belirlendi. Bantlamalar, çocuklar randomize bir şekilde 2 gruba ayrıldıktan sonra haftada 3 kez 8 hafta boyunca fonksiyonel düzeltme tekniği ile yapıldı.
Bulgular-Sonuçlar: Bantların anlık kinematik etkilerini daha detaylı incelemek için geniş örneklem grupları ve daha uzun tedavi süresi ile randomize kontrollü çalışmalar planlanmalıdır.
Tartışma: Yapılan istatistiksel analiz sonucunda rijit bantlama uygulanan bireyler ile elastik bantlama uygulanan bireylerin verileri karşılaştırıldığında bu iki grup arasında anlamlı bir fark bulunamamıştır($p < 0,05$). Grupların kendi aralarındaki verileri karşılaştırıldığında; Elastik bant uygulanan grupta elde edilen veriler arasında anlamlı bir farka rastlanamazken ($p < 0,05$) rijit bant uygulanan grupta denge ve kaba motor fonksiyonları açısından anlamlı fark bulunmuştur. ($p < 0,05$).

Comparison of the effects of elastic taping and rigid taping on the ankle on balance and gross motor functions in children with hemiparatic cerebral palsy

Purpose: The aim of this study was to investigate the effect of different taping approaches on the ankle in terms of balance and gross motor functions in children with hemiparetic cerebral palsy.
Materials and Methods: Twenty-four hemiparetic spli children aged 2-16 years were included in the study. Functional levels of the children were evaluated with Rough Motor Function Classification Scale (BMFSS) and motor levels were evaluated with Coarse Motor Function Measurement-88 (PFM-88). The Pediatric Berg Balance Scale (PSS) was used to assess the functional balance and mobility levels were determined using the Time-Stroke and Walk Test (TUG) and the 2-minute walk test. The bandings were performed randomly in two groups and then 3 times a week for 8 weeks with functional correction technique.
Results: When the results of the statistical analysis were compared with the individuals who had rigid banding and elastic banding, no significant difference was found between these two groups ($p < 0.05$). When the data of the groups are compared; While there was no significant difference between the data obtained in the elastic band group ($p < 0.05$), there was a significant difference in terms of balance and gross motor functions in the rigid band group. ($P <0.05$).
Discussion: To examine the momentary kinematic effects of taping in more detail, randomized controlled trials with large sample groups and longer treatment period should be planned

P11 Gelişimsel Koordinasyon Bozukluğu Olan Çocuklarda COPM Temelli CO-OP(Günlük Mesleki Performansa

Bilişsel Oryantasyon) Yaklaşımının Etkisi:Metaanaliz

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Amaç: GKB'de CO-OP yaklaşımının,aktivite katılımına etkisinin analizi amaçlanmıştır.
Gereç ve Yöntem
CO-OP yaklaşımı, literatürde vaka çalışması ve derleme olarak iki grupta taranmıştır.
Bulgular-Sonuçlar: CO-OP, GKB'li çocuklarda bireysel hedeflere yönelik stratejilerin; KMPÖ performans derecesinde ve ICF'in tüm düzeylerinde iyileşme sağladığını göstermiştir. CO-OP'nin bilişsel alan üzerine odaklanmasının; günlük yaşamda problem çözme becerilerini geliştirmeye yönelik olduğu bulunmuştur. Görev odaklı yaklaşımlar GKB'de güçlü etkiler oluşturmaktadır. Ön pozitif bulgulara göre CO-OP yaklaşımını uygulamak için kanıta dayalı daha fazla araştırma yapılması gerekmektedir.
Tartışma: GKB, bir çocuğun ince/kaba motor fonksiyonlarında önemli bir etken olup aktivite ve katılım kısıtlanmalarına yol açar. CO-OP, motor öğrenme teorilerine dayanan; görevlerin performansını geliştirmeye yönelik meta-bilişsel bir yaklaşımdır. CO-OP, bilişsel stratejilerde çocuğun kendi hedefini belirlemesini sağlar. KMPÖ bazlı CO-OP tedavilerinde, çocuğun katılım performansında anlamlı farklar bulunmuştur.

The Effect of COPM Based CO-OP (Cognitive Orientation of Daily Occupational Performance) Approach in Children with Developmental Coordination Disorders

Purpose: The aim of this study was to analyze the effect of CO-OP approach on activity participation in DCD.
Materials and Methods: The CO-OP approach was screened in two groups as case study and review.
Results: DCD is an important factor on the academic and social impacts of a child in fine / gross motor functions, leading to restriction of activity and participation. CO-OP is a meta-cognitive approach to improving the performance of goal-based tasks based on motor learning theories. CO-OP enables the child to determine his or her own goal in cognitive strategies. Significant differences were found in CO-OP based on COPM-based treatments.
Discussion: In the CO-OP, strategies for individual goals in DCD; The COPM showed an improvement in performance and ICF levels at all levels. Cognitive focus of CO-OP; It was observed that they aimed to improve their problem solving skills in daily life.

P12 Serebral palsili diplejik çocuklarda denge becerileri ve alt ekstremite hareketleri arasında herhangi bir ilişki var mıdır?

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Amaç: Diplejik serebral palsili çocuklarda (DP-CP) denge becerileri ve alt ekstremite hareketleri arasındaki ilişkiyi değerlendirmek
Yöntem: Çalışmamıza 4-14 yaş aralığında DP-CP'li 20 çocuk dahil edildi. Denge becerileri Erken Kliniksel Denge Ölçümü (EKDÖ) ile değerlendirilirken, alt ekstremite hareketleri ve yürüme aktivitesi Gözlemsel Yürüme Skalası (GYS) ve Süreli Kalk ve Yürü Testi (SKYT) ile değerlendirildi. Testler arasındaki ilişkiyi incelemek için Spearman Korelasyon testi yapıldı.p <0.05 anlamlı değer olarak kabul edildi.
Sonuçlar: EKDÖ ile SKYT arasında güçlü bir negatif korelasyon varken (r: -.- 851 **, p <0.01), EKDÖ ve GYS skorları arasında pozitif korelasyon vardı (r: 0.808 **, p <0.001). Ayrıca, GYS ile SKYT skorları arasında orta derecede negatif korelasyon bulundu (r: -.452 *, p <0.045).
Tartışma: Denge becerileri geliştikçe ve postüral stabilizasyon arttıkça, etkinin şiddetini azaltarak SKYT sırasında kaydedilen zamanın azaldığını ve hareketlilik seviyesinin artmasıyla fonksiyonel dengenin iyileşme ve yürüme bozukluklarını önleyeceğine inanıyoruz. Gelecekteki araştırmalar, farklı klinik CP tipleri ile daha geniş bir örnek grubu içeren çalışmalara odaklanmalıdır.
Anahtar Kelimeler: Serebral palsi, denge, yürüme aktivitesi

Is there any relationship between balance skills and lower extremity movements in diplegic children with cerebral palsy?

Purpose: to evaluate the relationship between balance skills and lower extremity movements in diplegic children with cerebral palsy (DP-CP)
Method: 20 children with DP-CP with the age of range 4-14 were included in our study. While balance skills were assessed by Early Clinical Assessment of Balance, lower extremity movements and walking activity were evaluated by Observational Gait Scale (OGS) and Timed Up and Go test (TUG).
Spearman Correlation test was performed to examine the relationship between the tests and
p <0.05 was considered significant value.
Results: While a strong negative correlation was found between ECAB and TUG scores
*(r: -.-851**, p< 0.01) and a moderate negative correlation was found between OGS and TUG scores (r: -.452*, p<0.045), there was a positive correlation between ECAB and OGS scores*
*(r: 0.808**, p< 0. 001).*
Discussion: We believe that as balance skills improve and postural stabilization increases, decreasing the severity of the effect decreases the time recorded during TUG, and as the mobility level increases, the functional balance will improve and prevent gait disorders. Future research should focus on studies that include a broader set of samples with different clinical types of CP.
Keywords: Cerebral palsy, balance, walking activity

ORAL ABSTRACTS

Developmental Theorıes And Bobath Approach

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Abstract: Motor development can define as difference in motor behavior and different theories are used to explain motor development. The most known theories are neuromaturation theory, dynamic systems theory and neuronal group selection theory. These theories make a base for therapy approaches targeting motor development. Bobath concept is an approach that is used for therapy of individuals with cerebral palsy and it profit by actual scientific data and theories. The aim of this review is to explain the place developmental theories in Bobath approach within scientific frame.

Motor Development and Theories

Motor development can define as continuous changing in motor behavior caused by interaction of biological structure of individual, necessity of motor task and environmental conditions.

In historical perspective, although different motor control theories were used to explain motor development, the most known theories are reflex/hierarchical theory which based on neuromaturation, more modern dynamic systems theory and more recently, neuronal group selection theory.

According to neuromaturation theory, lower centers are under control of upper centers and development occurs from proximal to distal. There are developmental stages and milestones. In typical development, primitive reflexes will diminish their activity and give place to postural reactions, on the other hand in atypical development, the control of upper centers are disappearing and primitive motor behaviors become dominant. This condition will result with delay of developmental stages and milestones. Interventions based on neuromaturation aim to catch developmental stages and milestones with using inhibition-facilitation and sensory stimulation.

According to an actual theory, dynamic systems theory, development is continuously and each developmental section is a base for another one. A developmental section is a stage for another section and movement- environment-task- child are under interaction and all subsystems are interaction within each other. Not only one subsystem, but also all subsystems are dominant in comprise movement. All systems have a role for the aim of functional movement with different ways. These all subsystems provide their organization spontaneously or they form movement together but with different ways for special function.

All systems have a part in therapy approaches under effect of dynamic systems theory and individual characteristics are considered. Therapy is planned as function-activity and task focused. Environment and parent interaction are important and considered in therapy.

According to neuronal group selection theory, there is not a unique control or a director at the central, motor program neither. Brain develops with activation of movement with sensory receptors but not with stimulation-respond. Brain has networks but these are not rigid, it has individual unity and flexibility at lifespan. The freedom level of movement control can arrange with selection of the most suitable neuronal groups according to task of body systems and current condition. The developing brain has ability of organizing dynamically with variable networks and it becomes selective with body structure and functions, behavior and motor development. Selected units transform to neuronal groups acting like functional units with strongly connected neurons so quality of movement and variability develop. Developing of motor behavior in normal development has three stages:

1. First variation: These are movements occurred by spontaneous neuronal repertoire determined epigenetically.
2. Selectivity: Selection and usage of function specific movements with experience of neuronal groups.

3. Secondary variation: A process of function directed movements with synaptic reorganizing, maturation after synaptogenesis and elimination.

Variability is the main determiner of typical development and atypical variability is determiner of motor control problems.

Therapy approaches based on neuronal group selection theory aim increasing experience of movement, enrichment of environment, parental inclusion, diversification of movement and supporting for qualified movement.

Bobath Approach and Motor Control

Bobath concept is a multidisciplinary approach for treatment of cerebral palsy (CP). In Bobath approach, scientific data is used for supporting clinical setting and intervention and actual motor control and learning theories, muscle physiology and neuroplasticity is included for practical applications.

Movement organization for functional tasks and postural variability are important according to Bobath concept. Motor outputs include different control stages of central nervous system. Functional loss caused by neuropathology may result compensation in motor development and maximal usage of residual functional capacity. Reorganizing skill of nervous system with intrinsic and extrinsic stimulations is a base of the therapy approaches.

All abilities of brain for modified functions based on environment and experience are used in interventions. Automatic and voluntary movements work harmonized and posture-movement integration is provided during activity. Erect position against to gravity can gain with maturation of postural system. In this position, adjustment capacity of center of mass and base of support are important to being active. Muscle tone, alignment of body structures and joints are supportive and non-neural structures are important either.

Bobath concept has interested in early intervention for a long time and this intervention based on motor control theories (Köng 1966).

In Bobath concept, therapist determine the problem with horizontally observation. Body posture, segmental alignment, muscle strength and coordination problems that limit function are determined and therapy focused on gaining these movement and activity. Therapy is planned as activity and participation based.

Automatic and voluntary movements of child only can enhance with gaining postural control. Parents and therapists determine limited activities of child together. Therapist investigate facilitators and inhibitors of movement and for making movement possible, he uses conditions including environment. Activities are used for participation.

Goal Specification and Intervention

The phase of Berta Bobath “We make movement possible” explains that Bobath concept uses all developmental theories.

It is important to enhance postural reactions for making voluntary movements sufficient. Postural reactions provide control the body against to gravity, keeping center of mass of the body inside of base of support, making isolated intersegmental and intrasegmental movements.

Neurological problems cause undeveloped movement patterns as lack of variability, reflective movements, asymmetry loss of dynamic balance, fatigue after performance, lack of strength, loss in control of muscle strength, inefficient motor planning (Shumway-Cook, A. 2012). According to Bobath concept this after this atypical movements, postural control can gain stage by stage with all different postural positions in development (Bobath 1984, Adolph KE 2000).

Normal postural control mechanism for normal functional activity based on development of three factors: a) normal postural tone (main mechanism for supporting body against to gravity) b) Reciprocal innervation c) automation of righting and equilibrium reactions.

Bobath concept gives opportunity to understand necessities of child, enhance motor skills of child and participation of child in different social programs.

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The Effect Of The Socioeconomic and Demographic Properties on Quality of Life of Families of Children With Cerebral Palsy: A Cross-Sectional Study

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Purpose: The purpose of this study is to investigate the effects of socioeconomic and demographic properties on quality of life in families of cerebral palsy children

Method: A total of 100 mothers of children with cerebral palsy from eight different special education and rehabilitation center in Gaziosmanpasa district in Istanbul were enrolled in this study. The age of the participants ranged from 19 to 65 years. The participants' quality of life were measured with the Short Form-36 and the socioeconomic and demographic properties were evaluated through Socioeconomic and Demographic Situation Survey Tools.

Results: The study revealed that the mean score of all domains of quality of life of the participants were lower compared to the standard score of the Turkish society. The pain dimension and mental health dimension of the mothers with more than one child with physical disability was lower than the mothers with one disabled child ($p<0,05$). When groups formed according to monthly incomes were compared in terms of quality of life, a significant difference was found between all the bottom score except for the bottom score of vitality ($p<0,05$). The score of pain, general health perception , vitality and mental health in the participants with nuclear families were significantly higher than those with traditional families ($p<0,05$). Between the groups formed according to cerebral palsy types, a significant difference was revealed in terms of general health perception, vitality, emotional role difficulty and mental health status ($p<0,05$).

Conclusion: The quality of life of the mothers of children with cerebral palsy are affected by a number of sociocultural and demographic factors. These primary factors are the number of children with physical disability, monthly income, residential property, type of cerebral palsy, insurance and marital condition

Keywords: SF-36, Cerebral Palsy, Socioeconomic, Demographic Property, Quality of Life

Introduction

Cerebral Palsy (CP) is characterized by chronic postural impairment and movement disorder accompanied by sensory and cognitive deficit and seizure(1, 2). One of the most fundamental hallmark of the CP is that it occurs in the early stage of the life and is not progressive(3). The prevalence of CP in the world is 2-3 in the 1000 live birth(4). In the Turkey, various studies indicated that this ratio is 4,4 in 1000 live birth(5). The problems in children with cerebral palsy or other disabilities affect the quality of life of the children themselves and their family negatively(6, 7). In the most society, especially in low-

and middle-income countries, the mothers are considered primarily to be responsible of own children with CP(8). However, it is needed caregivers in the line of parents' request, if their economic status is suitable(9). One of the main difficulty parents confront is how to manage the health problems of their children while providing their daily living needs(10). The burden of the mothers or caregivers of children with CP is related to their experience or the their children' s health status covering severity of physical, emotional and psychological problems. Several studies demonstrated that as the burden of the mothers increase, their physical heath, family function and social interaction are affected much more associated with the this augmentation(11, 12). Various studies conducted in the same field showed that the mothers of child with cerebral palsy suffer from anxiety, depression and fatigue much more than mothers without children with CP(13). Consequently, the quality of life of mothers with children with cerebral palsy is lower(14). These consequence indicate that the disability not only affect the children with cerebral palsy but also affect the members of their family, especially their mother, as well(15). Various studies showed that a high level of caregiving burden affects the mental and physical health, family functions and social interactions of caregivers(16). Because the children with CP need to taking care of further, their parents experience difficulty much more. In various culture ,the mothers suffer from more problems than the other family's members due to the mothers are considered to have responsibility of their children with disability(17). Taking care of children with various disabilities who need specific and longer time care lead their mothers to experience a lot of physical, mental and psychological problems(18). There are robust evidence that the mothers of children with disability experience physical and physiological complication more compared to the mothers of children without disability(19, 20). At the same time, various studies conducted reported that the health-related or other dimensions of quality of life of the mothers of children with CP are affected by the multifactor, such as socioeconomic status, satisfaction of marital, severity of disability(21, 22). In agreement with the information mentioned above, we hypothesized that the mothers of children with Cerebral Palsy are influenced by socioeconomic status, the number of individuals with CP and demographic conditions

METHOD

This current work was conducted between 2013 and 2014 of years in different Special Education and Rehabilitation Centers (Bağımsız Yaşam, Pandora, Altıncı His, İpekyolu, Sevgi Ana Kucağı, Güzel Yaşam, Lalegül, Özel Yaşamlar) in Gaziosmapasa , one of the district of Istabul province. The purpose of the selecting this district is that Gaziosmanpasa is poorer compared to other district with respect to income per month and is multicultural. A total of 100 mothers of children diagnosed with various subtype of Cerebral Children were enrolled in this study. All mothers accepted attending our study were informed about the study comprehensively and informed consent forms were get from everyone. Short Form-36 (SF-36) and the Socioeconomic and Demographic Situation Survey Tools were applied to all

respondents. The items of the tools were read by the researchers to participants who are not literacy. The age of mothers, constitution of families, insurance, economic status, subtype of CP, inception of age to take rehabilitation were obtained through Socioeconomic and Demographic Situation Survey. The SF-36 scale is one of the most common methods used to evaluate quality of life(23). The information about the eight different dimension of health, such as the physical function, restrictions (related to emotional and physical problems), social function, mental health, vitality, pain and general perceived health condition were evaluated via SF-36 scale.

Statistical Analysis

All the data obtained are analyzed with IBM SPSS Statistics V22.0 program. For analyzing the properties of socioeconomic status and demographic conditions of the participant, the description statistical analysis were used and the values of mean± standard deviations (M±SD) were given in the tables. Because the distribution of the between groups was normal, T test, one of the parametric tests according to number of groups, and ANNOVA test were used. The significance level was accepted as $p<0.05$.

RESULTS

A total of 100 mothers of children with CP, aged between 19 and 65 years, mean age 34,88 ±10,38 were enrolled in this study. The allocation of the scores into domains of SF-36 scale according to the groups of participants composed by their number of children with CP were given in the table 1.

Table 1: The Allocation of the Scores ınto the Subdomain of Quality Of Life as to SF-36 According to Participants' Children Number

Subdomains of SF-36	Number of Children with CP		P value
	One (N= 79)	More than one (N= 21)	
	Ort. ±SS	Ort. ±SS	
Physical Health Problems	67,92±29,52	72,00±21,71	0,478
Limitations Of Activities	59,74±30,54	53,53±29,34	0,389
Pain	44,21±25,47	44,21±22,89	***0,002**
General Health	46,46±28,54	44,46±26,54	0,054
Energy or Vitality	56,43±18,91	51,79±18,81	0,343
Social Activities	54,36±24,18	54,06±19,54	0,954

Emotional Health Problems	55,40±38,05	65,13±22,24	0,141
Mental Health	63,42±16,92	53,43±15,22	*0,014

*T test

There were significant difference in the score of pain and mental health subdomain between mothers relating to number of children with CP

The allocation of the scores into domains of SF-36 scale according to the groups of participants composed by their monthly income were given in the table 1.

Table 2: The Allocation of the Scores ınto the Subdomain of Quality Of Life as to SF-36 According to Participants' monthly income

Subdomains of SF-36	Monthly Income				Value P
	0-999 TL (n: 16)	1000-1999 TL (n: 43)	2000-2999 TL (n: 35)	More than 3000 TL (n: 6)	
	Ort. ±SS	Ort. ±SS	Ort. ±SS	Ort. ±SS	
Physical Health Problems	56,87±34,19	63,57±27,18	78,57±22,57	83,33±19,56	*0,013
Limitation of Activities	45,31±29,18	52,88±37,88	63,57±36,54	100,00±0,00	*0,008
Pain	57,93±29,30	51,52±22,97	68,08±27,14	72,00±29,74	*0,024
General Health	41,52±21,89	51,95±21,88	56,11±17,45	88,33±10,13	*0,000
Vitality (Energy)	47,81±8,93	57,11±29,94	56,14±22,45	57,50±19,17	0,424
Social Function	47,55±20,52	49,05±21,21	57,53±25,95	91,56±15,13	*0,000
Limitation of Emotion	47,91±36,45	54,25±34,89	57,14±23,87	100,00±0,00	*0,014
Mental Health	52,50±16,77	60,40±15,72	51,82±15,84	80,00±15,79	*0,008

*ANOVA test

There were significant difference in the score of physical function, limitation of activity, pain, social function, limitation of emotional and mental health subdomains between the mothers according to monthly incomes.

The distribution of the scores into the domains of SF-36 scale according to the groups of participants composed by their Education Status were given in the table 1.

Table 3: The Distribution of The Scores ınto The Subscales Of The SF-36 Quality Of Life Scale According to Educational Status

Subdomains of SF-36	Education Level						P Value
	Not Literacy (n: 9)	Literacy (n: 5)	Graduated from Primary School (n: 35)	Graduated from Middle School (n: 11)	Graduated from High School (n: 28)	Graduated from University (n: 12)	
	Ort.±SS	Ort.±SS	Ort.±SS	Ort.±SS	Ort..±SS	Ort..±SS	
Physical Health Problems	75,55±21,85	74,00±17,10	68,42±27,27	58,18±35,16	66,20±29,92	79.58±23.10	0,503
Limitation of Activities	66,66±41,45	30,00±44,72	57,85±39,18	63,63±23,35	53,54±33,82	70.83±36.67	0,354
Pain	71,24±20,40	69,00±28,56	57,32±22,71	51,45±36,28	57,20±28,96	66.83±25.90	0,421
General Health	50,33±22,45	48,20±27,66	51,91±22,85	55,63±21,29	55,23±22,81	60.41±18.07	0,846
Vitality (Energy)	63,33±21,79	60,00±18,70	55,85±21,89	43,63±17,90	53,06±16,42	61.66±19.69	0,147
Social Function	68,02±21,76	47,50±16,29	47,12±25,90	56,81±24,59	55,27±22,48	62.50±26.65	0,174
Limitation of Emotion	51,84±33,80	53,32±29,83	51,42±39,06	66,66±29,82	59,5±634,35	63.88±36.13	0,777
Mental Health	71,00±16,10	53.00±11,87	60,50±18,11	61,09±12,66	57,80±19,04	65.00±13.86	0,354

*ANOVA

There were no significant difference in the scores of the subdomains of SF-36 between the mothers according to educational status ($p>0.05$)

DISCUSSION

This current study in which the effects of socioeconomic and demographic properties on quality of life of the mothers of children with Cerebral Palsy, it was found that the quality of life of the mothers of children with CP is effected by the socioeconomic and demographic properties negatively. The life of a mother with low or moderate monthly income of a child with disability or CP starts with the birth of her child and continue lifelong (21). This inevitable association affects not only the mother's quality of

life but also affects the social function adversely(17, 18). In this case, if a mother who has a child with disability is not supported externally (support from caregiver or other family members), i.e. if the care of the disabled person is limited to the mother's motherly instinct, self-esteem, self-esteem and a sense of caring, the quality of life of the mother is low according to Turkish society standards.

In this study ıt was found that there were significant differences between the subgroups of the SF-36 Quality of Life Scale in terms of pain and mental health ($p<0.05$). The fact that the mother who looks after more than one child with disability one- to –one does lead to think that mother efforts further and consequently that they have lower score in pain dimension of quality of life

The fact that the mother who looks after more than one child with disability one- to –one leads mother to effort further and consequently brings about lower score in pain dimension of quality of life. In our study, there were significant differences between the sub-dimensions of the SF-36 Quality of Life Scale in terms of physical functionality, physical role difficulty, pain, general health perception, social functioning, emotional role difficulty and mental health scores among the groups formed according to the monthly income status of the participants ($p<0.05$ In the all dimensions of quality of life in which there were significant difference, except for mental health, it was seen that as the monthly income increase the score of the quality of life raises. The fact that there is no significant difference in terms of vitality and pain dimensions should be considered as the fact that these two dimensions may be related to body structure rather than monthly income. Particularly, the decrease in the score of the general health perception as the monthly income decrease is remarkable. The decrease in the monthly income may result in the inability to meet the care costs and l that the remaining family members cannot benefit from the budget and consequently induces decrease in the quality of life. While 43% of the families participated in our study had monthly income between 1000-2000 TL, the income of 35% were between 2000-3000 TL.

These data show that the vast majority of the participants had poor or moderate financial status and, as a result, the positive relationship between the above mentioned socioeconomic status and quality of life. It was determined that 95% of the mothers included in the study did not employ paid caregivers in the care of their children and they took care of the children themselves. Considering the socio-economic conditions of the region in which we conducted our current study, only 5% of the participants were expected to have paid caregivers. Mothers who are solely responsible for their children with physical disability may be alienate against other members of the family and their social environment in time because they cannot take some time for themself and spend most of their time in the care of sick children. The main reason leading to this consequence is that the mothers in poor societies with low educational level hold themself responsible for this and feel guilt to have children with disability. In this case, mothers of children with disabilities are not able to take sufficient some time for themself because they spend the vast majority of their time to fulfill their children’s special education needs, future concerns

about their children and their efforts to fulfill their role in the social environment. For these reasons, the general health perception, vitality, emotional role, and mental health of the mothers are affected negatively. Furthermore, it is inevitable that subtype of CP, severity, intellectual status, excessive muscle stiffness and other a lot of outcomes affect quality of life indirectly.

CONCLUSION

In this original study, in which the effects of some of the socioeconomic and demographic characteristics on quality of life of the mothers of children with CP were investigated, it was determined that the quality of life of the mothers with children with CP is considerable lower than of Turkish Society standards. Taken all together, the presence of children with CP or other disabilities in conjunction with negative demographic characteristics and insufficient socioeconomic status influence the quality of life of the mothers with CP children adversely.

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The Investigation of the Relationship Between Raimondi Hand Functions Classifıcation System and Mini-Macs Values in Obstetric Brachial Plexus Paralysis

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Abstract:

Objective: Obstetric brachial plexus paralysis (OBPP) is a nerve injury that occurs at birth and affects the upper extremity. The Raimondi Hand Functions Classification System (RHFCS) is frequently used to evaluate hand functions in OBPP. The aim of the study was to investigate the consistency of Raimondi Classification System with Mini-MACS which used in the classification of hand functions of patients with cerebral palsy.

Materials and Methods: Eighty-two children aged between 0-4 (mean 18.01 ± 10.75 months) with OBPP were included to the study. The hand functions of the children were evaluated with RHFCS and Mini-MACS by observation during functional activities. Same researcher performed the assessments on the same day. Pearson correlation analysis was used for determining the consistency of Mini-MACS with RHFCS.

Results: The relationship between RHFCS and Mini-MACS was found to be excellent ($r = -0.904$, $p = 0.0001$).

Discussion: The RHFCS system in OBPP was widely used in the classification of hand functions. The RHFCS system classifies hand function according to active normal joint movements, while the Mini-MACS classifies hand function by the quality of the movement during activity. Therefore, we think that Mini-MACS system can be used in the classification of hand functions in OBPP.

Keywords: Brachial Plexus, Hand function

INTRODUCTION

Birth injury of the brachial plexus that is generally called obstetric brachial plexus palsy frequently includes traction or tearing of the nerve plexus, which supply motor, sensory and autonomic innervation of the arm. The extent of damage varies between injuries of single nerve root to total root lesions. The impact of the lesion ranges from temporary functional deficits to a lifetime total disability due to severity of the nerve injury degrees (1,2).

The incidence ranges from 0.38 to 3 per 1000 live births in different developed countries (2,3). Although the major risk factor for injury is shoulder dystocia, maternal diabetes, macrosomia, multiparity method

of delivery and the mother's pelvic anatomy are among the factors that can cause trauma(1-3).

Depending on the variety of nerve injury, the affected upper limb has limited movement in different levels and types that may involve the shoulder, elbow, wrist and fingers. For this reason, different assessment systems are used which classify the affected extremity both according to joint movements and total motor performance (2,4).

The patient is usually classified based of injured nerve root and motor performance of the affected limb within the first 2 months after birth. Narakas classifies the cases within four groups based on the root involvement and related active movements: upper Erb's palsy (type 1), extended Erb's palsy (type 2), total (type 3) palsy, and total palsy with a Horner Syndrome (type 4). Type 1 group involves C5 – C6 injury, type 2 group involves C5 - C6 also C7 can participate the injury, type 3 involves C5 – T1 and type 4 group involves C5 – T1 with a Horner. This classification system is performed with observing the functional movements and it shows both the current motor capacity of the extremity (5).

Raimondi Hand Functions Classification System (RHFCS) that is the system of classifying hand functions of patients with obstetric brachial plexus paralysis and is frequently used in the literature. This system classifies the patients in six different grades by observing active joint movements in the hand and forearm. Grade 0 represents the lowest functional level and Grade 5 represents the highest functional level (6). The grades of the classification system are shown in the table 1.

Table 1: Grades of Raimondi Hand Function Classification System and explanations (6).

Grade	Explanation
0	Flail, or useless finger flexion; useless thumb; sensation defective or absent
1	Weak finger flexion, possibility of thumb lateral pinch. No extension of wrist or digits
2	Active extension at wrist, with passive ("tenodesis") or weak flexion of fingers. Weak lateral pinch of thumb
3	Strong flexion of wrist and digits. Thumb mobile with useful abduction and apposition. Intrinsic balance. Good possibilities for palliative operations to regain extension of wrist, and to improve rotation deformity of forearm.
4	Strong flexion of wrist, digits, good small muscle function and a mobile thumb. The defects include extension of digits and restricted pronation and supination.
5	As IV, with finger extension and complete or almost complete pronation ands supination.

Although RHFCS is widely used in previous studies, it evaluates hand movements rather than functional use or hand activities in daily life. For this reason, a different evaluation system is needed to classify the affected hands of the patients according to their functional use (7,8).

The Mini - Manual Ability Classification System (Mini-MACS) has been used to describe how children with cerebral palsy (CP) use their hands when handling objects in activities of daily living. It has been developed for use with children with CP younger than 4 years of age. The Mini-MACS comprises five levels, that Level I represents the highest functional level and Level V represents the lowest functional level. In the original study, each level is defined separately and the differences between the levels are specified. The level of the child is determined by the scoring of the physiotherapist or parents after observation (9). The levels of the classification system are shown in the table 2.

Table 2: Levels of Mini-MACS and explanations (9).

Level	Explanation
1	Handles objects easily and successfully
2	Handles most objects, but with somewhat reduced quality and/or speed of achievement
3	Handles objects with difficulty
4	Handles a limited selection of easily managed objects in simple actions
4	Does not handle objects and has severely limited ability to perform even simple actions

The aim of our study was to investigate the relationship between Mini-MACS and RHFCS that was developed to classify hand functions of individuals with OBPP.

METHODS and MATERIALS

Our study was performed at Hacettepe University, Department of Physiotherapy and Rehabilitation, was completed between December 2017 and March 2018. Hacettepe University Non-Interventional Ethics Committees approved the research plan on 19.12.2017 (G0 17/967-39). It was initiated after receiving the informed consent form from the families.

Participants

Eighty-two children aged between 0-4 (mean 18.01 ± 10.75 months) with OBPP were enrolled to the

study. The children had Narakas type 2 and type 4 injuries.

Procedure and Instrument

After the informed consent was read to the families of the participants and signed, the hand functions of the children were evaluated with RHFCS and Mini-MACS by observation during functional activities and playing games. Same researcher executed the assessments on the same day.

Statistical Analysis

Statistical analyses were performed using the SPSS software version 22. The numerical variables were summarized with mean ± standard deviation, median [minimum - maximum] values. The variables were investigated using visual (histograms, probability plots) and analytical methods (Kolmogorov-Simirnov/Shapiro-Wilk's test) to determine whether or not they are normally distributed. The Ordinal variables were found to be normal distributed. The consistency of RHFCS m and Mini-MACS values were determined by Pearson correlation coefficient. A p value of less than 0.05 was considered to show a statistically significant result (10).

RESULTS

The relationship between RHFCS and Mini-MACS was found to be excellent ($r = - 0.904$, $p = 0.0001$).

DISCUSSION

This study showed that the results of two classification systems used in different disease groups were perfectly consistent in children with OBPP. The first classification system was RHFCS that was developed to evaluate for children with OBPP and also frequently preferred for classifying hand functions of the children. On the other hand, other classification system, which was Mini-MACS classifies hand function of children with CP between 1 and 4 years of age and have never been used for children with OBPP.

The reason for using these two classification systems was that they did the evaluation with different perspectives. RHFCS classifies hand based on active range of finger, wrist and forearm movement however Mini-MACS classifies hand function according to how it grasps objects or uses them.

When the sub-items of the RHFCS are examined in detail, flexion-extension of the fingers and wrist and the supination pronation of the forearm are important in rating. Because the limitations in these movements are widespread in children with OBPP, active joint movements related to the hand are included in the evaluation parameters (6). On the hand, Chang et al. said that RHFCS focus entirely on

particular muscle power or joint movement with little regard for the actual implications that such as hand usage in daily living activities and/or psychosocial well-being (7). For these reason, the authors express that the classifying system is difficult to assess activity, participation and the overall impact and/or effectiveness of treatments in everyday life.

RHFCS has been shown in different review studies in the most preferred classification systems in OBPP field (4,7,8). Even though it has been reported being one of the most widely used 5 evaluation systems in surgical study (7), RHFCS did not get enough score for use in the clinical and scientific studies in a Delphi study published in 2018. The Delphi study was "Outcome Assessment for Brachial Plexus Birth Injury. Result From the iPluto World-Wide Consensus Survey" provided consensus on how to assess and report outcome for OBPP. In the study, it was reported how the body structure and function area should be evaluated. Although the study provided a survey only for assessments of body structure and function, RHFCS did not get enough points in three rounds of the survey and was not included in the recommended evaluations (11).

RHFSC were specifically designed and is the only method used to evaluate the hands of patients with OBPP; however, lack of evaluation of activity, participation and daily life hand usage is a major deficiency in this field according to the International Classification of Functioning, Disability and Health (ICF) (7,8). The International Classification of Functioning, Disability, and Health (ICF) developed by Word Health Organisation suggest a framework for describing and organizing information about functioning and disability. Based on a bio-psychosocial model, the ICF emphasizes the functional component of health and the key role of the interrelation of different factors affecting functioning. Functioning is determined as "what a child with a health condition can or is able to do every day". Body function and structure impairments, activity limitations, participation restrictions, personal and environmental factors are evaluated and classified within the ICF framework (12). Two different review study about evaluation of the patient specified that RHFCS is used to classify hand function based on only body function and structure impairments area. Therefore, we thought that there were significant insufficiencies in hand evaluation in the OBPP area with ICF perspective.

Manual Ability Classification System (MACS) is used frequently in clinical and scientific research after being developed by Eliason et al, classify that how children with CP use their hands when handling objects in daily activities. It has been shown to be valid for use with children with CP from 4 to 18 years of age. Likewise, Mini-MACS is a classification system produces from the MACS, but attempt to classify younger children. Because Mini-MACS users generally aim to find out what objects the child usually handles, how they handle them and how they use them, the classification system is stated to evaluate activity domain in ICF (9).

This study is aimed to determine the relationship between two evaluation methods in different perspectives based on ICF and to give a different classification method to the OBPP. For this reason Mini-MACS were preferred. It is necessary to evaluate and classify hand function based on activity domain in ICF fields, so we believe Mini-MACS can also be used for children with OBPP younger than 4 years old because the result of the study showed that two different classification systems are perfectly compatible.

Supported by: None

Conflict of Interest: None

Ethics Approval: Ethics committee approval was obtained from Hacettepe University Non-Interventional Clinical Research Ethics Committee with the decision number G0 17/967-39

Informed Consent: The informed consent was read to the families of the participants and signed.

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Evaluating Developmental Delay in Early Stage of Life: Mapping Assessment Tools From The International Classification of Functioning, Disability and Health' Principle: A Review Of Assessment Tools

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Objective: The phase of detection of children with delays or disability in motor development comprises developmental screening, examination, and reexamination. During this process, different types of tools are utilized, assessing body structure & function, activity and participation. Accordingly, the aim of this systematic review is to retrieve the all assessment tools used for early identification in children at risk and to allocate these tools into International Classification of Functioning, Disability and Health' main domain considering the purpose of their use in clinic setting and researches

Data sources: Six electronic databases (Cochrane Library, EMBASE, Ovid MEDLINE, PubMed, www.tandfonline.com, Wiley Library) were searched comprehensively

Results: A total of forty assessment tools were defined and characterized with respect to International Classification of Functioning, Disability and Health' main domain. On the basis of this perspective, the researchers took into account motor (b760), sensory (b260,b265) and musculoskeletal system (b710), besides, primitive reflexes (b750), postural reactions (b755), functional movement (b750-b789), spontaneous movements (b761), communication (d310) and etc. While the many of these defined tools are about the body function, some of these are proper for activity and participation.

Conclusion: Various types of assessment tools evaluate different aspects of ICF, including body function& structure, activity and participation. For this reason, the tools should be selected according to purpose of the evaluation.

Key Words: Assessment Tool, Developmental Delay, ICF, Early Intervention

INTRODUCTION

Newborn infants with delays or disorders in motor development are generally subjected to a number of potentially deleterious prenatal, perinatal or early postnatal events(1). With survival rates of preterm and low-birth-weight infants improving, there is an increase in the number of these infants with motor

impairments later in life, ranging from developmental coordination disorder to cerebral palsy(2, 3). It is widely accepted that infants biologically at high risk of developmental disorders, such as infants born preterm or infants with neonatal encephalopathy, should be screened as early as possible, because assistance is needed to cope with the immediate and potentially prolonged traumatic effects of the turbulent events(4, 5). Most of the pediatric physical therapists evaluate the quantity and quality of children's motor skills for clinical decision making. In the line of this aim, sensitive, reliable, and valid instrument is a prerequisite for early detection of infants with developmental motor disorders, such as cerebral palsy (CP) and developmental coordination disorder(6, 7). The phase of identification of children with delays or disorders in motor development encompasses developmental screening, examination, and reexamination(8). During this process, various types of measures evaluating different subdomains of International Classification of Functioning, Disability and Health's conceptualized framework are utilized, including body structure and function, activity and participation . The International Classification of Functioning, Disability, and Health (ICF-CY) offers a framework for describing and organizing information about functioning, activity and participation, besides, contextual factors, i.e., environmental and individual factors(9). Based on a collective model, the ICF focus on the structural and functional component of the health. Importantly, the ICF promote service providers to incorporate all components of health when addressing the impact of having a health condition on every day functioning(9). In the line with information mentioned above, choosing an appropriate evaluative instrument is a crucial part of the examination process and should be geared toward the purpose of testing and characteristics of the child (10). Consequently, selection of an appropriate measure will depend on the purpose of testing (i.e. body function or activity) and characteristics of the child, in addition to reliability and validity of the measure (11)

The aim of this review is to summarize the following: (a) sourcing and determining the assessment tools used to evaluate the infants or child with a delay or disorder in motor development in different database, (b) contexts of the each instruments relating to ICF, (c) categorizing the all defined tools into the main domains of ICF, (d) presenting the decision-making process for selection with respect to the assessment' aim

METHOD

Search Strategy

In June 2018, a comprehensive systematic literature search on all articles relating to infants or children at risk published from the past to the present was carried out using the following electronic databases: Cochrane Library, EMBASE, Ovid MEDLINE, PubMed, www.tandfonline.com, Wiley Library . The keywords 'assessment tool', 'developmental delay', 'ICF', 'early intervention' were used as search terms. The keyword "infant" was searched as a Population Descriptor or Sample Descriptor and then, this

keyword was combined with other keywords to reach all relevant studies. Consequently, a total of 467 articles and 40 assessment tools extracted from all defined articles were examined by two authors in terms of purpose and content.

Inclusion and exclusion criteria

All defined instruments were reviewed with respect to content, purpose, target population and ICF's main domain. Taken altogether, the instruments were selected if (1) their purpose is to detect infants or neonatal with developmental delay (2) they were evaluative of body function & structure , activity and participation under the ICF's main domain up to four years. Assessment tools were excluded from the study if they were (1) not relevant to developmental delay, (2) only about children aged more than 4 years, (3) only about psychological and social behavior. After exhaustive research in different databases, a total of 467 articles and 40 assessment tools subtracted from these articles were screened for eligibility. At the first stage, 400 articles were excluded due to various reasons. Subsequently, the remaining 67 articles were reviewed by authors considering the inclusion criteria. After a detailed examination of each article, the authors agreed on 50 articles for systematic review.

RESULTS

A total of 40 assessment tools relating to detecting abnormality in the early stage of life were identified by the search strategy, of which thirty satisfied all the predefined inclusion criteria on further examination. The property, purpose and allocation of each instrument into subdomain of the ICF are summarized in Table I. A total of 10 assessments tools associated with preschool children or older children assessments were excluded because they did not primarily evaluate infants

Tablo1: Clinical utility of included infant assessment tools with respect to their purpose and ICF' main domain

Tools	Aims	ICF domain
1.The Alberta Infant Motor Scale (AIMS): 0–18mo	Movement quality, Gross motor	Body function
2.Bayley Scale of Infant and Toddler Development – Version III: 1–42 months	Gross motor, fine motor, neurological integrity (Mental scale and psychomotor scale)	Body function, body structure
3.Peabody Developmental Motor Scales – Version (PDMS-2):0-5 years	Gross motor, fine motor, object manipulation, grasping, evaluative and visual motor integration, reflexes	Body function, activity
4.Test of Infant Motor Performance (TIMP): 4 months or less	Movement quality, gross motor, postural control and function	Body function

5.Toddler and Infant Motor Examination (TIME): 4-42 months, 4 months to 3.5 years	Gross motor, fine motor, mobility, stability, motor organization	Body structure, body function
6.Prechtl's Assessment of General Movements (GMs): preterm birth to 4 months	Gross motor (Spontaneous movement)	Body function
7.Neuro Sensory Motor Development Assessment (NSMDA): 1mo–6y	Movement quality, Gross motor, fine motor, neurological, primitive reflexes, postural reactions, and motor responses to sensory input	Body function
8.Movement Assessment of Infants (MAI): 0–12month	Gross motor fine motor, neurological, primitive reflexes, postural reaction, motor responses to sensory input,	Body function
9.Posture and Fine Motor Assessment of Infants (PFMAI):2-12 month	Gross motor, fine motor, posture and fine motor control,	Body function
10.The Gross Motor Performance Measurement (GMPM)	gross motor performance, functional movement, quality of movement	Body function
11.The Pediatric Balance Scale (PBS): pediatric population	balance	Body function
13.Griffiths Mental Development Scale (Griffiths-II): between 1 month and 8 years of age	locomotor scale (A); personal-social scale (B); hearing and speech development (C); hand and eye co-ordination (D); and performance tests scale (E).	Body structure, body function participation,
14.Denver-II Developmental Screening Test,	Gross motor, fine motor, social function, communication	Body function, participation
15.Parent Report of Children's Abilities(PARCA): 24 months	cognitive and language development	Body function
17.Ages& Stages Questionnaire: from 1 month to2.5 years of age,	Fine motor, gross motor, problem solving, personal, social,	Body function, participation

parent questionnaire	communication	
18.Parents' Evaluation of Developmental Status: from birth to seven years and 11 months	developmental and social-emotional screening	Body function, participation
19.Child Engagement in Daily Life and the Ease of Caregiving Measure: Young Children	motor abilities, self-care, feeding, participation, and playfulness of young children with CP	Body function, participation
20. Best Scale: 6 month-8 years	quality of grasp (hand function on request) and spontaneous hand use (bilateral manipulation),	Body function, activity
21. Gross Motor Skills Assessment Sheet	gross motor skills	Body function
22. Observable Movement Quality (OMQ): 6 months to 6 years	automated movements, asymmetry in movements, variation in movements, appropriate gross motor movements, fluency of movements, reduced muscle tone, increased muscle tone, involuntary movements, accuracy, slow/delayed movements, accelerated/abrupt movements, tremors, strength regulation, and stereotyped movements	Body function, body structure,
23. Gross Motor Performance Measure (GMPM): from 5 months to 12 years of age.	Movement quality (alignment, coordination, dissociated movement, stability, and weight) shift	Body function, activity
24. Quality of Upper Extremity Skills Test (QUEST): *18 months to 8 years*	-quality of upper limb movement and function -dissociated movement, grasp, protective extension, and weight-bearing	Body function, activity
25. Combined Assessment of Motor Performance and Behavior (CAMPB): 0-7 years	-gross and four fine motor functions	Body function, participation

	-assessments of co-ordination -attention social behavior and an overall evaluation of the child's Performance in motor function, perception and attention	
26. Structured Observation of Motor Performance (SOMP): 0 to 12 months of age	spontaneous and volitional movements	Body function
27. Neuromotor Behavioral Inventory (NBI): 0 to 12 months and 3 years	movement reactions, motor task, and on neuromotor behavior.	Body function, activity
28. Infant Motor Profile (IMP): 3 to 18 months	a video-based measure for infants, spontaneous motor behavior of infants (supine, prone, sitting, standing, and walking)	Body function
29. Harris Infant Neuromotor Test (HINT): 3 to 12 months	motor behavior in a supine-lying position, during transition to a prone-lying position, in a prone-lying position, and in supported sitting and supported standing positions, quality of the infant's movement behaviors, motor performance	Body function
30. The Carolina Curriculum for Infants and Toddlers with Special Needs: from birth to 36 months,	five developmental domains: personal-social, cognition, communication, fine motor, and gross motor	Participation, body function

Clinical utility of each included assessment tools are outlined in Table I. The timing to use assessments tools varies depending on the age of the infants and its purpose. Most assessment tools can be utilized by a range of health practitioner; however, it is important for these professionals to have information about instrument they intend using in their studies or in clinical setting(12, 13).

DISCUSION

The thirty assessment tools included in this review are all convenience for evaluating motor development of infants with developmental delay, however, each tool may have different characteristics with respect to ICF's main domain(14). For the clinician or researcher, the most important step in deciding the best instrument is the purpose of the assessment including body function, activity or participation. Many tools are appropriate in evaluating more than one ICF' main domain; however, they may not have the validity studies to support their claims. The clinical utility of assessment tools should be decided by considering ICF-CY's subdomain. Namely, an evaluative assessment tool must be characterized with the conceptual framework of the ICF. This may be especially important in clinic setting before decide an appropriate early intervention, or for screening infant' s development processes.

Conclusion

Infants at risk develop differently from infants without risk. On the other hand , this does not purport that all infants at risk will experience developmental delay, however, appropriate assessment with appropriate assessments tools are needed for infants at risk. There is almost no assessment tool that can undertake all variables of the infant's development because motor development are influenced by a great number of factors, such as body structure and body function, social, environment, and other health conditions . For these reason, it is very important that purpose of the assessment should be taken into account in the context of the ICF main domain when decide an assessment tools

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Which approach is more effective in 6-18 months infants wıih Cerebral Palsy signs, neurodevelopmental therapy or following with home program? A Retrospectıve Study

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ABSTRACT

Purpose: To compare the effectiveness of the neurodevelopmental therapy with home program in 6-18 months old infants with cerebral palsy (CP) sings.

Methods: The files of the infants who had cerebral palsy sings and were referred for early intervention by the pediatric neurologist to Hacettepe University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Cerebral Palsy and Pediatric Rehabilitation Unit were retrospectively reviewed between December 2016 and August 2018. Eighteen infants aged 6-18 months were analyzed. Nine infants, who came to take Neurodevelopmental therapy (NDT) one hour a day/twice a week/six months, were included in NDT group. Nine infants, who came to take home program, were included in HP group. In both groups, the results of gross motor function measurement (GMFM-88) and classification system (GMFCS) were evaluated before and after treatment. Wilcoxon test was used for statistical comparison, $p < 0.05$ was considered significant.

Results: Infants were similar in age, height, weight, birth week, birth weight and motor function level. In the NDT group: $p_{supine\text{-}prone}=0.027$, $p_{sitting}=0.007$, $p_{crawling\text{-}overtheknee}=0.007$, $p_{standing}=0.008$, $p_{walking\text{-}running\text{-}climbing}=0.018$, $p_{GMFMtotal}=0.012$ and $p_{GMFCS}=0.008$. In the HP group: $p_{supine\text{-}prone}=0.043$, $p_{sitting}=0.042$, $p_{crawling\text{-}overtheknee}=0.109$, $p_{standing}=0.317$, $p_{walking\text{-}running\text{-}climbing}=0.317$; $p_{GMFMtotal}=0.027$ and $p_{GMFCS}= 0.157$.

Conclusion: Whereas there were improvements in all prone–supine, sitting, standing and walking sub-dimensions and mobility level in the NDT group, the developments were only in the prone-supine and crawling sub-dimensions in the HP group. Neurodevelopmental therapy and home program are effective in the development of gross motor function of risky-infants. Game based-NDT with home program should support the motor development more than only home program follow up.

Keywords: Neurodevelopmental therapy, risky infant, home program

INTRODUCTION

Cerebral palsy (CP) describes a group of permanent disorders of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the develop in fetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of

sensation, perception, cognition, communication, and behavior, by epilepsy, and by secondary musculoskeletal problems. [3]

Early intervention approaches in risky infants are the earliest period after birth to benefit from brain plasticity and rapid maturation, which is to support the development of baby.[3] These applications include neurodevelopmental therapy, baby massage, home program, family-oriented trainings.[2] The aim of this study was to compare the effectiveness of neurodevelopmental therapy with the home program in 6-18 months old infants with cerebral palsy sings.

METHODS

This is a retrospective study. The files of the infants who had cerebral palsy sings and were referred for early intervention by the pediatric neurologist to Hacettepe University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Cerebral Palsy and Pediatric Rehabilitation Unit were retrospectively reviewed between December 2016 and August 2018. 6-18 months old infants who were not diagnosed Cerebral Palsy but had signs of CP were included in this study. The infants who has insufficient socio-demographic information, incomplete six-month evaluation, and have additional neuro-motor problems excluded from this study. As a result of selection; data of eighteen infants was analyzed retrospectively.

Nine infants who had taken Neurodevelopmental Approach once a day, twice a week for six months at Cerebral Palsy and Pediatric Rehabilitation Unit were included in NDT group. Nine infants who could not come to the unit for physiotherapy and rehabilitation because of various reasons such as transportation, working hours of caregivers were also taken to the home program (HP) group.

In the NDT group, infants were taken one-hour neurodevelopmental therapy in a day, twice a week for six months. Various facilitations were used in prone, supine, sitting, standing position. When physiotherapist applied facilitations in an activity, the infants stimulated with age appropriate toys and games. Parents or caregivers took family education for example; baby positioning, carrying was presented to the family and, assistive devices were recommended if necessary for infant.

In HP group, infants could not take sessions at the unit. Various positions, baby massage, assistive devices were explained and showed to parents or caregivers for applying at home. It was asked to come back to her routine check up every three to six months.

Assessments

The experienced physiotherapist obtained socio-demographic data and history of infant from parent or caregiver and made clinical assessment in Cerebral Palsy and Pediatric Rehabilitation unit. Gross Motor

Function Classification System (GMFCS) and Gross Motor Function Measurement (GMFM-88) were used to assess gross motor function and repeated routinely every 3 to 6 months.

1. Gross Motor Function Classification System (GMFCS); Gross motor function classification system is a standardized method that classifies motor function differences in sitting and walking in 5 levels, in children with CP. Level I walks without restriction; Level II walks with restrictions; Level III walks using hand-held mobility tools; Level IV, independent self-movement is restricted and can use the motorized mobility tool; Level V is carried in a wheelchair pushed by hand.[4]

2. Gross Motor Function Measurement (GMFM-88); is divided into 5 main sections. It consists of a total of 88 items, including 17 in the supine-prone position and rotation section, 20 in the sitting section, 14 in the crawling-over the knee section, 13 in the standing section and 24 in the walking-running-stair climbing section. Each item is scored between 0-3. Then, the percentage points and total percentage points of the 5 sub-sections are calculated. The higher the score, the better the development of motor function.[5]

Statistical analysis:

SPSS 23.0 program was used for statistical analysis. Age, height, birth week, birth weight and motor function level minimum, maximum, mean and standard deviation values were calculated. Non-parametric measurements were chosen due to the small number of people in the groups and the lack of normal distribution of data.. Wilcoxon test was used to compare GMFCS, GMFM subdivisions scores and GMFM total scores change between the HP group in NA, and $p < 0.05$ was considered statistically significant.

RESULTS

Infants were similar in age, height, weight, birth week, birth weight and motor function level. In the NA group, $p_{supine\text{-}prone}$ was 0.027, $p_{sitting}$ was 0.007, $p_{crawling\text{-}kneeling}$ was 0.007, $p_{standing}$ was 0.008, $p_{walking\text{-}running\text{-}climbing}$ was 0.018; $p_{GMFMtotal}$ was 0.012 and p_{GMFCS} was 0.008. In the HP group; $p_{supine\text{-}prone}$ was 0.043, $p_{sitting}$ was 0.042, $p_{crawling\text{-}kneeling}$ was 0.109, $p_{standing}$ was 0.317, $p_{walking\text{-}running\text{-}climbing}$ was 0.317; $p_{GMFMtotal}$ was 0.027 and p_{GMFCS} was 0.157.

Table-1: Age, height, birth week, birth weight and motor function level of babies in groups

	Groups	Minimum	Maximum	X ± SD
Age	NDT	9	18	14.33 ± 3.6
	HP	9	18	13.5 ± 5.31
Height	NDT	68	93	83.66 ± 8.23
	HP	64	90	76.25 ± 8.81
Birth weight	NDT	1160	3150	2313 ± 799
	HP	500	3000	1908 ± 898
Birth week	NDT	28	40	34 ± 4.09

	HP	25	38	32.37 ± 5.12
GMFCS	NDT	2	4	3
	HP	1	5	3

X: mean, SD: standard deviation, NDT: neurodevelopment therapy, HP: home program

Table 2: Comparison of GMFCS, GMFM sub-total and total score changes before and after treatment (Wilcoxon test)

Grup		**GMFCS**	**GMFM-A**	**GMFM-B**	**GMFM-C**	**GMFM-D**	**GMFM-E**	**GMFM-total**
NDT		3.11	75	53.33	35.22	25.77	15	40.82
		2.33	89.77	74.66	54.89	45	29.33	56.33
	Z	-2.64	-2.20	-2.67	-2.67	-2.66	-2.36	-2.52
	p	0.008	0.027	0.007	0.007	0.008	0.01	0.012
HP		3.75	60.25	50.25	38.75	23.75	20	38.42
		3.5	67.75	54.75	40.62	24.37	21.25	41.47
	Z	-1.41	-2.02	-2.03	-1.60	-1.00	-1.00	-2.20
	p	0.157	0.043	0.042	0.109	0.317	0.317	0.027

DISCUSSION

While sitting, standing and walking in the lower part of the baby's locomotion level increased in the NGT group, the developments were only in the prone-supine and crawling subdivisions in the HP group.

The diagnosis of CP was made at an older age in the previous but now the diagnosis of CP is made in babies under the corrected age of six months. Therefore, physiotherapy and rehabilitation can be applied at younger ages. The earlier the diagnosis is made, the more effective the effectiveness of early intervention. Mayo et al. emphasized that intensive neurodevelopmental therapy (one session a week) was more effective than routine therapy (one session a month) on motor and cognitive skills of high risk infants.6 Hielkema et al. compared COPCA (family education) and neurodevelopmental practice, they found motor improvements were equal in both groups.7 In this current study, 6-18 months old infants who were at risk of being CP were treated six months under early intervention. At the end of the six months, motor functions improved in both groups, but the development was more in the neurodevelopmental approach group.

Morgan et al comparing games-based and therapy-based intervention in risky infants, the game-based therapy program was found to be more effective in the development of motor skills.8 The current study neurodevelopmental therapy performed in accordance with the motor and cognitive developmental stages of infants and age-appropriate games. The exercises were also showed to parents of the home program group but phsiotherapist emphasised that the implementation of exercises performed with the games. The significant improvements were observed in all areas of prone, supine, sitting, standing and walking-running-stair climbing areas in the neurodevelopmental treatment group.

CONCLUSION

The neurodevelopmental therapy and home program are effective in the development of gross motor function of infants at risk. Neurodevelopmental therapy with home program will support the development more than only home program or family education approach. It is recommneded that these approaches or therapies carried out with age-apropriate gaming activities.

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The Relationship between Gender and Motor Development in Risky Infants

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Purpose: Risky infant definition refers to infants who may exhibit neuro-motor development problems due to environmental or biological factors. As well as risk factors it is stated that gender may have effects on normal motor development of infants. The aim of this study is to determine whether there are differences between males and females in terms of motor development in risky infants. **Methods:** The study included 67(30 female, 37 male) risky infants with a corrected age of 3-18 months. Infants were divided into three age groups as 0-6, 7-12, 13-18 moths according to their corrected age. Infant Motor Performance (IMP), was used to evaluate spontaneous motor behavior of risky infants. Variance, adaptation, symmetry, fluency, performance dimension scores and total score were calculated. Corrected ages, birth weights and gestational ages of the infants were recorded. **Results:** There was no difference between the corrected ages, birth weeks and birth weights of girls and boys in all three age groups ($p > 0.05$). There were differences in IMP Variation ($p = 0,020$), IMP Symmetry ($p = 0,004$), IMP Performance ($p = 0,033$) and IMP Total score ($p = 0,012$) in girls and boys with corrected age between 0-6 months. These scores were higher in male infants. **Discussion:** Results of our study It was seen that the motor development of male infants in risky infants between 0-6 months was better than that of female infants. **Conclusion**: Performing separate comparisons for each month may be useful to determine the role of gender on motor development.

Keywords: Infant Development, Risk, Premature Birth

Introduction

Normal motor development is a dynamic process that can be affected by many environmental and biological factors. Several studies have shown that environmental factors such as gestational age, birth weight, gender, as well as environmental factors such as mother's educational status, number of siblings, or sleeping position, have effects on normal motor development (Bayley 1965, Davis, Moon et al. 1998, Koutra, Chatzi et al. 2012). There are many risk factors that may lead to neurodevelopmental delay in infants; infants who face these risk factors are referred as high-risk infants. Preterm birth or very low birth weight may be associated with significant motor disorders that persist throughout childhood (de Kieviet, Piek et al. 2009). The importance of risk factors may change in the first years of life, and biological

factors become less important over time. Although a single negative biological or psychosocial marker does not always lead to developmental delay, the simultaneous presence of several negative factors may lead to an increased risk of developmental retardation (Garmezy 1993, Koutra, Chatzi et al. 2012). There are few studies examining gender differences in terms of infant movements. The aim of this study is to determine whether there are differences between boys and girls in terms of motor development in risky infants.

Methods: Risky infants aged 3-18 months were included in the study. Infants divided into three age groups as 3-6, 7-12, 12-18. Infants with severe extremity and spine deformity that can affect voluntary movement, infants with severe visual impairment, infants who cannot establish eye contact were not included in the study. Infant Motor Performance (IMP) (Heineman, Bos et al. 2008) a video-based assessment tool, was used as to assess spontaneous motor behavior of risky infants. Each IMP video was shot for an average of 15 minutes. Variation, variability, symmetry, fluency and performance dimension scores and total score of IMP were calculated. Corrected ages, birth weights and gestational ages of the infants were recorded. For statistical analysis of data, Windows based SPSS (Version 22, Armonk, NY: IBM Corporation) analysis program was used. Kolmogorov-Smirnov test was used to determine the normal distribution of data. Mann Whitney U Test was used because the data did not show normal distribution.

Results: The study included 67 (30 girls, 37 boys) risky infants with a corrected age of 3-18 months. There was no difference between the corrected ages, birth weeks and birth weights of boys and girls in all three age groups ($p > 0.05$). There were differences in IMP Variation ($p = 0{,}020$), IMP Symmetry ($p = 0{,}004$), IMP Performance ($p = 0{,}033$) and IMP Total score ($p = 0{,}012$) in girls and boys with corrected age between 3-6 months. These scores were higher in male infants. There was no difference between the male and female infants in terms of other scores ($p > 0.05$).

Discussion: Results of our study showed that the motor development of boys was better than that of girls for 3-6 month age range. This difference is seen only in the range of 3-6 months can be explained by the fact that biological factors initially create more risk but in time the effects of environmental factors may play major roles (Garmezy 1993). In the literature, there are few studies examining the relationship between gender and motor development in risky infants. Since these studies are not methodologically similar to our study, it is difficult to compare the results. In a study that analyzed healthy infants between the ages of 1 month and 15 months with Bayley's evaluation, no difference was found between genders in terms of motor development (Bayley 1965). In another study, the difference between male and female infants for various motor milestones has been investigated, while it is observed that males develop more rapidly in gross motor areas, whereas girls tend to progress further in functional areas that require finer motor activities (Touwen 1976). According to a study conducted in Greece, it is reported that female

infants have better neurodevelopmental outcomes than boys (Koutra, Chatzi et al. 2012). In a study conducted on 18-month-old infants, it was reported that there was no difference in normal motor development between girls and boys (Goyen and Lui 2002). These results indicate that future research is needed to reach a decision. In our study, since the number of infants per month could not be reached, the data of the infants were divided into age intervals.

Conclusion: Performing separate comparisons for each month in future studies may be useful to determine the role of gender on motor development.

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Tables

Table 1. Differences between genders in terms of motor development in 3-6 months old high risk infants.

		Girls (n=9)		Boys (n=11)		Mann-Whitney U Test
		Min-Max	X±SS	Min-Max	X±SS	p
Corrected Age		3,5-6	5,11±1,02	3,5-6	4,88±0,93	0,603
Gestational age		29-38	34,11±2,18	32-40	36,07±2,87	0,249
Birth Weight		1,48-3,14	2,18±0,74	1,45-3,52	2,82±0,74	0,058
Infant Motor Profile	Variation	58,00-82,00	68,00±8,09	63,00-93,00	78,36±9,79	**0,020**
	Variability	NA	NA	NA	NA	NA
	Symmetry	33,00-	72,22±18,99	67,00-100,00	92,81±10,82	**0,004**
	Fluency	67,00-	77,88±13,66	67,00-100,00	88,00±15,40	0,184
	Performance	27,00-	39,55±5,72	33,00-56,00	47,45±7,67	**0,033**
	Total Score	46,00-	64,33±9,77	57,00-86,00	76,54±9,03	**0,012**

Table 2. Differences between genders in terms of motor development in 6-12 months old high risk infants.

Table 3. Differences between genders in terms of motor development in 12-18 months old high risk infants.

		Girls (n=8)		Boys (n=11)		Mann-Whitney U Test
		Min-Max	X±SS	Min-Max	X±SS	p
Corrected Age		14-17	15,25±1,25	13-18	15,77±1,88	0,644
Gestational age		36-42	38,00±2,70	25-39	38-27±4,54	0,351
Birth Weight		2,5-3,06	2,85±0,26	0,70-3,70	2,55±0,97	0,793
Infant Motor Profile	Variation	0,00-87,00	64,75±43,16	57,00-98,00	81,72±12,53	0,948
	Variability	0,00-100,00	69,50±46,62	50,00-100,00	80,54±18,25	0,894
	Symmetry	0,00-100,00	75,00±50,00	67,00-100,00	93,00±10,86	0,768
	Fluency	0,00-100,00	75,00±50,00	70,00-100,00	90,45±13,31	0,938
	Performance	0,00-88,00	55,50±38,44	38,00-89,00	66,36±18,38	0,556
	Total Score	0,00-95,00	68,00±45,43	59,00-97,00	82,45±11,81	0,844

		Girls (n=13)		Boys (n=15)		Mann-Whitney U Test
		Min-Max	X±SS	Min-Max	X±SS	p
Corrected Age		7-12	9,23±1,57	6,5-12	9,53-1,75	0,608
Gestational age		29-41	37,07±3,47	32-40	35,06±2,96	0,082
Birth Weight		1,5-3,80	2,92±0,68	1,45-3,30	2,29±0,75	0,054
Infant Motor Profile	Variation	58,00-100	89,69±11,49	63,00-100,00	85,14±11,13	0,242
	Variability	50,00-100	83,30±16,86	50,00-100,00	86,57±16,08	0,572
	Symmetry	33,00-100	88,53±20,34	67,00-100,00	91,92±11,39	0,937
	Fluency	67,00-100	93,00±13,43	63,00-100,00	93,78±12,64	0,894
	Performance	28,00-96,00	65,38±19,75	39,00-88,00	62,21±15,20	0,544
	Total Score	47,00-97,00	83,92±14,68	65,00-98,00	83,92±9,99	0,560

The relationship between the repetition of multi-level Botulinum Toxin Injection, mobility level, selective motor control of lower extremity, gait and balance in children with cerebral palsy

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Purpose: Multi-level Botulinum Toxin (BT) injection is widely used in the treatment of spasticity in children with cerebral palsy (CP). It was aimed to investigate the relationship between the repetition of multi-level Botulinum Toxin Injection, mobility level, selective motor control of lower extremity, gait and balance in children with CP.

Methods: 3-12 years old children with diplegic CP, had multilevel BT injection was applied by a physician were included. The repetition numbers of injections were recorded. Gross Motor Function Classification System was used for mobility level. Walking activity was assessed with Gilette Functional Gait Assessment (Gilette). Selectivity was assessed with Selective Control Assessment of the Lower Extremity (SCALE), balance assessed with Pediatric Berg Balance (PBB). Spearman correlation analysis was used for statistical analysis and $p < 0.05$ was considered significant.

Results: The mean age of randomly selected 15 children with CP was 7 ± 2,39 years. The number of injections ranged from 1 to 10. Maximum repetition was nine belonged to a child in GMFCS level 3. The relationship between the repetitions of BT and the assessments were $r_{GMFCS} = 0.425$ $r_{SCALE} = -0,424$, $r_{PBB} = -0,357$, $r_{Gilette} = -0,337$.

Discussion: It was found that the repetition of BT decreased as mobility level improved. While a moderate negative relationship was found between the number of BT repetition and lower extremity selective motor control, a poor negative relationship was found between repetition, gait and balance skills.

Conclusion: BT injection is more common in children with lower mobility and locomotion levels. The number of BT increases in children with decreased selective motor movement and poor balance skills. In future studies, selective lower extremity control and balance skills change should be investigated before and after BT repeats in the large sample group.

Key words: Botox, cerebral palsy, motor control, balance

Introduction

Cerebral Palsy (SP) is a group of permanent posture and movement disorders that cause activity limitation due to non-progressive disorders in the developing brain.[1] Botulinum toxin (BT) has been used in spasticity management since 1993. It is a local, dose-dependent injection and causes reversible paresis in the muscle.[2] BT

induces partial chemodenervation and relaxation in the muscle by inhibiting the release of acetylcholine at the neuromuscular junction.[3] It can be injected in a single muscle or multiple muscles in a session. The relaxation of muscle lasts from four to six months and it can be repeated if needed.[4] This study aimed to investigate the relationship between the repetition of multi-level BT Injection, mobility, selective motor control of lower extremity, gait and balance in children with CP.

Methods

The study was conducted within the scope of doctorate thesis with 48/09 number of Ethical committee. 3-12 years old children with diplegic CP were included in this study. All children were applied multilevel BT injections by a physician at Physical Therapy and Rehabilitation Clinic in Dışkapı Yıldırım Beyazıt Training and Research Hospital. The children were referred to Hacettepe University, Faculty of Health Sciences, Physiotherapy and Rehabilitation Department, Cerebral Palsy and Pediatric Rehabilitation for evaluating.

The data of previous BT injections (the number of repetition, muscles etc.) was taken from hospital file and parents of children. Nine years experienced physical therapist applied all clinical assessments. Gross Motor Function Classification System (GMFCS) was used to determine the mobility level. GMFCS is a five level ordinal scale and classifies mobility and locomotion of children with Cerebral Palsy. [5] Walking ability was assessed with Gilette Functional Gait Assessment (Gilette).[6] Gilette is a parent reported questionnaire for evaluating gait performance of the children with CP in daily life. The motor control was assessed with Selective Control Assessment of the Lower Extremity (SCALE). The selective movements of bilateral hip, knee, ankle, subtalar joint and toes are rated between 0 and 2. All joint scores are collected for total score. [7] Balance was evaluated with Pediatrik Berg Balance Scale (PBB). It is a test battery rated between 0 and 4 with fourteen items. [8]

Statistical analysis

SPSS 23.0 program was used for statistical analysis. Spearman correlation analysis was performed and $p < 0.05$ was considered significant.

Results

Seven were female and eight were male in randomly selected 15 children with spastic type CP. The mean age was 7±2.39 years. All the children were diplegic. Four children were in level 1, four children were in level 2, seven children were in level 3 accordance with GMFCS. The numbers of Botulinum Toxin injection was changed from one to ten. The maximum repetition was nine belonged to a child in level 3 (Table1). The relationship between the repetitions of BT and the assessments were $r_{GMFCS} = 0.425$ $r_{SCALE} = -0,424$, $r_{PBB} = -0,357$, $r_{Gilette} = -0,337$ (Table 2).

Table 1. Characteristics of children with CP

Age (mean±sd)	7±2.39 (3-11)
Sex female male	n(%) 7(46.7) 8(53.3)
Gestational weig gram)	2029.33(800-4750)
Gestational ag week)	33 (28-40)
GMFCS (n)	The number of BT repetition (min-max)
Level 1 (4) Level 2 (4) Level 3 (7)	1-2 1-5 1-9

Table 2. The relationship between the repetitions of BT and the other assessments

		GMFCS	SCALE	PBD	Gilette
The repetitions of BT	rho	0.425	-0.424	-0.357	-0.337
	p	p<0.05	p<0.05	p<0.05	p<0.05
GMFCS	rho	1	0.632	-0.782	-0.880
	p		p<0.05	p<0.05	p<0.05
SCALE	rho		1	0.787	0.684
	p			p<0.05	p<0.05
PBB	rho			1	0.900
	p				p<0.05
rho: Spearman correlation coefficient, GMFCS: Gross motor function classification system, SCALE: selective control assessment of lower extremity, PBB: Pediatric Berg Balance, Gilette: Gilette Functional Gait Assessment					

Discussion

In this current study, it was found that the repetitions of multilevel BT injections decreased when the mobility of the children improved. While a negative correlation was found between the number of BT repeats and the lower extremity selective motor control scores, a poor negative correlation was found between the number of repetitions, balance and walking skills (table 2).

Botulinum toxin is safe at a young age, dose-dependent, reversible, selective. BT injections should be fine-tuned for each patient individually following an extended standardized clinical examination and an evaluation of posture, gait and/or other motions. The clinical examination focuses on spasticity, range of motion, strength and selective muscle control. [9] Ghroubi et al. stated that the motor functions and quality of life of children increased after repeated BT application.[10] In this current study ıt was found that when the number of CT was increased, selective movement values decreased. Kahraman et al. emphasized that the first two injections/one repeat BT especially relieve spasticity and improve fine and gross motor activities in their systematic review.[11] The

numbers of BT injection varied from one to nine repetitions. No serious side effects associated with the number of repeats were recorded.

Balance and selective motor control scores were decreasing as the number of repeats increased. It was thought that the reason for this was the high balance problems of the children with high severity and the need of BT would be more in children with low mobility and poor balance.

Conclusion: BT injection is more common in children with lower mobility and locomotion levels, poor selective motor control and balance skills. The repetetions of BT increases in children with low selective motor movement. In future studies, selective lower extremity control and balance skills change should be investigated before and after BT repeats in the large sample group.

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Investigation of Activity And Particıpation Levels of Cerebral Palsy Children in 2-4 Years Old

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ABSTRACT

Purpose: Cerebral palsy (CP) with an incidence of 4.4/1000 live births in Turkey is the most common cause of motor impairment in children. Functional independence of children with CP and their activity and participation are restricted. In this study, we planned to investigate the activity and participation levels of children with CP between the ages of 2-4 years.

Methods: This study was conducted within the scope of TUBITAK-1001 project. 66 children with CP were included. Children's demographic informations were recorded. Gross Motor Function Classification System (GMFCS) was used for children's gross motor function level and Pediatric Evaluation Disability Inventory (PEDI) for children's activity and participation. Children were divided into 5 groups by GMFCS levels. PEDI self-care, mobility and social functions sub-parameters were analyzed. SPSS.22 program was used for statistical analysis. Mann-Whitney-U-Test was used for pairwise comparisons to determine differences between groups. Significance level was determined as $p<0.05$.

Results: Children's age, height, weight were similar. In all of sub-parameters, there was a decrease in independence's level as the GMFCS levels increased. In the GMFCS 1,2 and 3, cahnges in only the mobility were statistically significant ($p<0.05$). However, ın the GMFCS 4 and 5 the changes in all of the sub-parameters were statistically significant ($p<0.05$).

Concluison: We observed children with CP had decreased activity and participation level from an early age. This decrease occurs in only moblity sub-parameter in children with good functional status, but in children with poor functional status it occurs in all parameters. Treatment should be started at the earliest age and it should be holistic.

Keywords: cerebral palsy, activity, participation, PEDI

INTRODUCTION

Cerebral palsy (CP) describes a group of permanent disorders of the development of movement and posture, causing activity limitation, that are attributed to nonprogressive disturbances that occurred in the developing fetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, perception, cognition, communication, and behaviour, by epilepsy, and by secondary musculoskeletal problems (1). Surveillance of Cerebral Palsy in Europe (SCPE) classified CP as spastic (bilateral or unilateral), dyskinetic, ataxic, mixed and nonclassified types (2).

While the incidence of CP in Europe is approximately 2,5 in 1000 live births, in Turkey the incidence of CP is 4,4 in 1000 live births (3, 4). With this incidence, CP is the most common cause of motor disability in childhood. Motor problems negatively affect the mobility of children with CP and severely limit the child's functional independence and activity and participation in the community (5).

The aim of this study was to investigate whether this motor impairment affects the activity and participation levels of children with CP at 2-4 years of age.

METHODS

This study was conducted within the scope of TUBITAK-1001 project. A total of 66 children (28 girls and 38 boys) with CP were included in the study. Children's demographic information recorded after being asked to their families. This includes informations about the child's age, height, weight, week of birth, birth weight.

The gross motor function level of children was determined according to Gross Motor Function Classification System (GMFCS). GMFCS is a valid and reliable classification that determines the functional level in children with CP (6). GMFCS was revised and expanded in 2007 and customized by age (7). GMFCS evaluates functional level in 5 levels (Table-1). Children were divided into 5 groups according to GMFCS levels (level 1,2,3,4 and 5) after determining the level of GMFCS of children.

Pediatric Evaluation Disability Inventory (PEDI) was used to assess children's activity and participation level. PEDI evaluates the activity and participation of children between 6.5 months and 8 years. PEDI evaluates daily life activities in three sub-parameters such as mobility, self-care and social functions. For each question, a score between 0 (full dependent) and 5 (fully independent) is awarded. PEDI was done by asking families. PEDI's mobility, self-care, social functions sub-parameters were examined (8).

Table-1: GMFCS levels in children 2-4 years old

GMFCS LEVELS	**DESCRIPTION**
Level I	Children floor sit with both hands free to manipulate objects Floor sitting and standing are performed without adult assistance

	Children walk as the preferred method of mobility without the need for any assistive mobility device.
Level II	Children floor sit but may have difficulty with balance when both hands are free to manipulate objects Children pull to stand on a stable surface Children can crawl reciprocally, can cruise, walks with assistive devices
Level III	Children maintain floor sitting often by "W-sitting", and may require adult assistance to assume sitting Children may pull to stand on a stable surface Children creep on their stomach or crawl (often without reciprocal leg movements) and cruise short distances, may walk short distances indoors using a hand-held mobility device (walker)
Level IV	Children floor sit when placed, but are unable to maintain alignment and balance without use of their hands for support. Children frequently require adaptive equipment for sitting and standing. Self-mobility for short distances (within a room) is achieved through rolling, creeping on stomach, or crawling on hands and knees without reciprocal leg movement.
Level V	Physical impairments restrict voluntary control of movement and the ability to maintain antigravity head and trunk postures. Functional limitations in sitting and standing are not fully compensated for through the use of adaptive equipment and assistive technology. Children have no means of independent movement and are transported

Statistical Analysis

IBM SPSS .22 program was used for statistical analysis of data. Kruskal-Wallis test was used to see if there was a difference between PADI scores of groups. Mann-Whitney-U-Test was used for pairwise comparisons to determine differences between groups. Significance level was determined as $p<0.05$. In addition, mean PEDI scores of children in groups were expressed as mean and standard deviation.

RESULTS

Of the 66 children, 12 were level 1 according to GMFCS, 16 were level 2, 14 were level 3, 13 level 4 and 11 were level 5. Age, height, weight, birth week and weight of the children in the groups were similar (Table2).

Table-2: GMFCS levels and demographic information of children

	Level-1 (n=12)	Level-2 (n=16)	Level-3 (n=14)	Level-4 (n=13)	Level-5 (n=11)
Age (X ± SD) (year)	3,20 ± 0,86	3,32 ± 0,74	3,17 ± 0,82	3,26 ± 0,85	2,95 ± 0,61
Height (X ± SD) (cm)	98 ± 11,6	97,6 ± 6,92	92 ± 7,81	100,4 ± 22,62	86,85 ± 8,68
Weight (X ± SD) (kg)	12,81 ± 2,61	14,9 ± 3,02	12,33 ± 2,27	16,29 ± 9,8	10,62 ± 2,18
Birth Week	35,6 ± 3,95	33,8 ± 5,08	32,09 ± 4,12	33,75 ± 5,13	36,3 ± 5,59
Birth Weight (X ± SD) (kg)	2,53 ± 1,00	2,52 ± 0,98	1,84 ± 0,76	2,22 ± 1,06	2,72 ± 0,78

X: mean, SD: standard deviation

When GMFCS levels and PEDI scores were examined, as the GMFCS level increased, the mean scores of children's PEDI sub-parameters (mobilty, self-care, social functions) decreased (Table-3). Kruskall Wallis Test was used to determine whether there is a difference among GMFCS groups. There was a difference in PEDI sub-parameters scores among the groups. Mann Whitney U Test was used for pairwise comparisons to determine differences between groups. When the score changes of PEDI were examined, between the GMFCS level 1 and 2, and between the GMFCS level 2 and 3, only the change in mobility sub-parameter was statistically significant ($p<0,05$). However, between the GMFCS level 3 and 4, and between the GMFCS level 4 and 5, changes in the all of PEDI's sub-parameters (mobility, self-care, social functions) were statistically significant ($p<0,05$) (Table-4).

Table-3: PEDI average score distributions according to GMFCS levels

		Level-1 (n=12)	**Level-2 (n=16)**	**Level-3 (n=14)**	**Level-4 (n=13)**	**Level-5 (n=11)**
Self-Care	(min-max)	16 - 69	21 - 70	1 - 52	1 - 43	0 - 40
	(X ± SD)	49.92 ± 14.68	42,94 ± 14,68	29 ± 15,76	16,08 ± 13,38	5,64 ± 11,55
Mobility	(min-max)	34 - 59	12 - 59	2 - 31	0 - 12	0 - 25
	(X ± SD)	46.83 ± 7,9	33,56 ± 15,09	13,93 ± 8,17	4,69 ± 3,56	2,82 ± 7,45
Social Function	(min-max)	22 - 62	4 - 65	2 - 65	1 - 64	0 - 55
	(X ± SD)	44,17 ± 13,57	38,5 ± 20,5	37,83 ± 17,32	18,92 ± 20,23	7,73 ± 16,49

Table-4: Pairwise comparisons of the PEDI sub parameters

		Level 1and 2	**Level 2 and 3**	**Level 3 and 4**	**Level 4 and 5**
Mobility	**p**	0,014 *	0,000 *	0,002 *	0,016 *
	Z	-2,463	--3,515	-3,046	-2,412
Self-Care	**p**	0,329	0,109	0,037 *	0,008 *
	Z	-0,976	-1,601	-2,088	-2,646
Social Functions	**p**	0,515	0,852	0,022 *	0,026 *
	Z	-0,651	-0,186	-2,286	-2,221

DISCUSSION

In the present study, it was found that children with CP were restricted in their daily life from an early age. This restriction was parallel to the level of ambulation. The level of independence was also better in children with good ambulation. As the ambulation level of the children decreased, their independence levels were also decreasing. Limitation of self-care and social functioning was also observed. Between GMFCS level 1 and 2, and between levels 2 and 3, there was only a significant limitation in mobility, but there was no significant difference in self-care and social functions. However, there was a significant

limitation in all areas of mobility, self-care and social functions between GMFCS levels 3 and 4 and between levels 4 and 5.

Whittingham et al. in a study of infants with cerebral palsy, they found that social functions increased with time in infants with GMFCS levels 1, 2 and 3, whereas in children with levels 4 and 5, social functions were always low compared to their peers. The findings of the present study were similar to this study (9).

In another study, it was reported that there was a relationship between gross motor and fine motor levels and cognitive and social functions in infants with cerebral palsy (10). In the present study, it was observed that as the ambulation level decreased, there was a decrease in social functions and self-care functions of ınfants. We think that GMFCS level may be helpful in predicting social functions and self-care functions in infants.

CONCLUSION

Children's mobility, self-care functions and social functions decrease as the level of rough motor movement decreases in children with cerebral palsy. There is a relationship between GMFCS level and social functions and self-care functions. Reduced social functions and self-care functions, especially in infants with GMFCS levels 4 and 5. Therefore, treatment of infants with CP should be started early and treatment should be holistic.

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Evaluation the motor repertoire in neurologically risk infants

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Abstract

Purpose: Developmental and neurological problems in infants may occur for a variety of reasons. This study was planned to evaluate motor repertoire in neurologically risk infants.

Methods: Infants at risk aged between 6 and 9 months who were admitted to Hacettepe University Department of Physiotherapy and Rehabilitation for evaluation and follow-up were included in the study. Medical information of infants was recorded from hospital files and asking their family. In order to evaluate the motor repertoire, a total of 15 minutes of video recording was taken in four positions including supine, prone, sitting and standing positions. The video scores were rated according to the Infant Motor Profile (IMP) test.

Results: The median age of 10 risky infants (5 term, 5 preterm) and similar age of 5 healthy infants was 7 months (min: 6 months, max: 9 months). IMP variation, adaptation, symmetry, fluency, performance, total sub-headings were significantly different between risky infants and healthy infants ($p < 0.05$). There was a significant difference between the two sub-headings of IMP preterm-term, preterm-healthy and term-healthy infants in multiple comparisons ($p < 0.05$).

Conclusion: It is suggested that IMP assessment will lead the way for professionals in order to follow-up and initiate early intervention programs for infants with neurologic high risk after preterm or term delivery. More studies are needed with larger participants.

Key words: Risk infant, Motor repertoire, Early intervention

Introduction

All infants complete many growth and development steps until they become adults. Delay or deficiency in any of these steps causes developmental problems. Developmental and neurological problems in infants may occur for a variety of reasons (1). Sometimes neurological problems may be congenital or started before birth. In some cases, prematurity or difficulties during delivery can cause brain damage and cause neurological problems. In infants, asphyxia, seizures, bleeding, cerebrovascular malformations, hydrocephalus, neural tube defects are common conditions that can lead to neurological problems (1, 2).

Close follow-up and care infants is important to prevent or reduce future problems in neurologically risky infants. The use of the appropriate evaluation method facilitates treatment. General Movements (GMs) analysis and Test of Infants Motor Performance (TIMP) tests are frequently used for clinical neuromotor prediction. However, these tests only cover the period from the newborn to the four-month period (3, 4). For this reason, the Infant Motor Profile (IMP) test has been developed to monitor the development of

motor movements and to determine the motor repertoire of the infant. IMP is an evaluation method which is used on 3-18 month old infants by videotaping the infant's movements in supine, prone, sitting and standing positions. IMP has 80 items which consist of five domains, three traditional neuromotor domains (symmetry, fluency and performance) and two novel domains, variation and variability, that are based on the Neuronal Group Selection Theory (NGST). Each domain can be scored individually. The total score can be calculated by summing all domains.
The aim of this study is to evaluate the risky infants with IMP and to compare them with their healthy peers (5-6).

Methods

10 risky infants with ages between 6 and 9 months who were applied for evaluation and follow-up Hacettepe University Department of Physiotherapy and Rehabilitation Cerebral Palsy and Pediatric Rehabilitation Unit were included the study. The evaluation was done according to corrected ages of premature infants. The IMP test was used to evaluate the motor repertoire of babies. Video recording was done at the time when the baby felt the best, according to the sleeping and feeding patterns of the infants. Firstly, infants' spontaneous movements were recorded. After these video recordings were taken in four positions including supine, prone, sitting and standing. Videos were scored by a physiotherapist who did not know the age and medical condition of the infant.

Results

The study included 10 risky infants (5 term, 5 preterm) and 5 healthy infanst of similar age. The median age of the infants at risk was 7 months (min: 6 months, max: 9 months). The median age of healthy babies was 7 months (min: 6 months, max: 9 months). Groups were similar in age ($p > 0.05$). there were significant difference) in terms of motor repertoires between risky infants and healthy infants according to IMP domains; variation ($p < 0.05$), adaptation ($p < 0.05$), symmetry ($p < 0.05$), fluency ($p < 0.05$), performance ($p < 0.05$) and total ($p < 0.05$), (Table 1).

Table 1: Comparison IMP scores between neurologic risk infants and healty peers

IMP domain	NRI (n=10) Median (min-max)	HI (n=5) Median (min-max)	p
Variation	68 (53-90)	90 (90-93)	0,012*
Adaptation	70 (50-80)	90 (80-92)	0.037*
Simetry	95 (67-100)	95 (95-100)	0.022*
Fluency	75 (50-100)	100 (96-100)	0.014*

Performans	46 (34-73)	74 (64-84)	0.010*
Total	68 (63-88)	85 (80-94)	0.015*

IMP: Infant Motor Profile, NRI: Nörologic Risk Infant, HI: Healty Infant, min: Minimum, max: Maksimum, *p<0.05, Kruskall Wallis test

Multiple comparisons for the determination of motor repertoire between preterm and term and healthy infants; between preterm and term infants adaptation and symmetry (p <0.05) domains, between preterm and healthy infants (p <0.05), symmetry (p <0.05), fluency (p <0.05), performance (p <0.05), total (p <0.05) and between the term and healthy infants (p <0.05), fluency (p <0.05), performance (p <0.05) domains were found to be different (Table 2).

Table 2: Multiple comparisons IMP scores between preterm, term and healty infants

	IMP domains					
Multiple comparisons	Variation Median (min-max)	Adaptation Median (min-max)	Simetry Median (min-max)	Fluency Median (min-max)	Performans Median (min-max)	Total Median (min-max)
Preterm-	66 (53-76)	68 (48-70)	89 (67-100)	75 (70-75)	43 (34-53)	68 (63-72)
Term	68 (66-90)	80 (50-80)	100 (95-100)	75 (50-100)	51 (43-73)	74 (66-88)
p	0.478	0.022*	0.044*	0.987	0.344	0.203
Preterm-	66 (53-76)	68 (48-70)	89 (67-100)	75 (70-75)	43 (34-53)	68 (63-72)
Healty	90 (90-93)	90 (90-95)	100 (96-100	100 (96-100)	74 (60-84)	85 (80-94)
p	0.001**	0.309	0.022*	0.006**	0.002*	0.002*
Term-	68 (66-90)	80 (50-80)	100 (95-100)	75 (50-100)	51 (43-73)	74 (66-88)
Healty	90 (90-93)	90 (90-95)	100 (96-100)	100 (96-100)	74 (60-84)	85 (80-94)
p	0.01*	0.287	0.917	0.008*	0.026*	0.052

IMP: Infant Motor Profile, min: Minimum, max: Maksimum, *p<0.05, **p<0.001

Conclusion

The results of the study showed that preterm and term risk infants had less motor repertoire than their healthy peers. Heineman et al. found that preterm infants had lower scores on IMP performance and total domains than term babies. It is compatible with the results obtained from the study (6).

Hieneman et al. suggested that it is stated that premature birth is not a risk factor and it is caused by intraventricular hemorrhage and periventricular cystic lesions (7, 8). In our study 30% of preterm infants have intraventricular hemorrhage so it explains the difference in IMP score. In addition, the presence of brain lesions such as hydrocephalus, microcephaly and corpus kollsum agenesis in infants born to term explain low IMP scores compared to their healthy peers.

As a result, IMP is a valid, reliable and sensitive method for evaluating motor behavior in infants. With the IMP, not only the baby's motor abilities, but also the diversity of motion, the ability to select movement strategies, symmetry and fluency of movement can be evaluated. Further studies with larger patient groups and different neurological diseases are needed in the future.

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