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HOW THE DEVELOPMENT OF TONE AND POSTURE OCCURED IN NEW BORNS

YENİ DOĞANLARDA TONSAL GELİŞİM VE POSTÜRÜNÜN OLUŞUMU

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Abstract

Our total body postural behavior results from an integration of all our body reflexes, and this integration occurred in central nervous system. New born baby do not have this integration and his/her all movements are automatic and crud level. Normal brain leads to normal development. And lesion in abnormal brain leads to abnormal development. Lesion in immature brain leads to abnormal tone development and abnormal postures. In cerebral palsy there is lesion in immature brain that leads to abnormal sensory-motor development. In cerebral palsy there is no integration of neonatal reflexes and delayed in motor development. Abnormal reflex movements produce abnormal synergies and abnormal posture. Primitive reflexes have very important role in development of child. These reflexes also have prime importance in assessment and evaluation. As there is brain lesion in these children, upper center do not have inhibitory effect on lower center, so there is an exaggerated reflex movements. There are different senserimotor approaches of treatment like Bobath, Brunnstrom's movement therapy, Rood's approach and proprioceptive neuromuscular facilitation. Theoretical basis of these treatments are neurodevelopmental modal, reflex theory, hierarchical theory and system approach. Reflex integration should be major component of treatment in children with cerebral palsy.

Keywords: cerebral palsy. development of tone, primitive reflexes, neonatal reflexes

Özet

Vücut postural davranışımız bütün vücut reflekslerinin birleşiminden meydana gelir ve bu birleşme merkezi sinir sisteminde oluşur. Yeni doğan bebekler bu birleşmeye sahip değillerdir ve bütün hareketleri otomatik ve ilkel seviyededir. Normal beyin normal gelişimi sağlar. Anormal beyindeki lezyon ise anormal gelişime yol açar. Olgunlaşmamış beyindeki lezyon anormal tonal ve postural gelişime sebep olur. Beyin felcinde, anormal duyu-motor gelişime yol açan olgunlaşmamış beyindeki lezyon anormal tonal ve postural gelişime sebep olur. Beyin felcinde, anormal duyu-motor gelişime yol açan olgunlaşmamış beyin lezyonu vardır fakat neonatal refleks birleşmesi ve motor gelişimde gecikme yoktur. Anormal refleks hareketleri anormal sinerji ve postür oluşturur. İlkel reflekslerin çocuk gelişiminde çok önemli bir rolü vardır. Ayrıca, bu refleksler değerlendirme ve belirlemede birincil öneme sahiptir. Bu çocuklarda beyin lezyonu olduğu için üst merkezin alt merkez üzerinde engelleyici etkisi yoktur ve bu yüzden aşırı refleks hareketleri mevcuttur. Bobath, Brunnstrom'un hareket terapisi, Rood'un yaklaşım ve proprioseptif nöromüsküler kolaylaştırması gibi farklı duyumotor tedavi yaklaşımları vardır. Bu tedavilerin teorik temeli nöregelişimsel model, reflex teorisi, hiyerarşik teori ve sistem yaklaşımıdır. Refleks birleşimi beyin felci olan çocukların tedavisinde ana unsur olmalıdır.

Anahtar Kelimeler: beyin felci, tonsal gelişim, ilkel refleksler, neonatal refleksler

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1. Introduction

Our total body postural behavior results from an integration of all our body reflexes, and this integration occurred in central nervous system (Loram, 2015). New born baby does not have this integration and his/her all movements are automatic and at crud level (Ахметзянова, 2014). New born baby borns with the influence of neonatal reflexes. These new natal reflexes play a vital role in the development of tone and posture (Keven and Akins, 2016). Head control, increase extensor tone, developing rotatory component and appearance of equilibrium reactions are basic components of motor development (Ivancevic et al., 2015). Skills in body are leaned by integration of neonatal reflexes. Neonatal reflexes are controlled by segmental level and that's why baby have no meaningful movements (Ozmun and Gallahue, 2016). As CNS takes the control and inhibition of theses reflexes are gained, baby leaned skills. Acquisitions of these skills are a complex process in which neonatal reflexes play a prime role in development of tone in specific group of muscles (Sharma and Cockerill, 2014). increased tone in specific group of muscle causes to adopt a posture, and posture is the key behavior to learn skills.

Babies born with maximum flexor tone; there is flexion in arms and legs. With the development, this tone is counter balance by extensor tone and body achieve an erect posture that is preliminary in acquisitions of skills. Neonatal reflexes are automatic movements in the life of every child, most of neonatal reflexes disappeared at the age of 06 month. Initial six month in baby life is very important, if theses reflexes persist, there is delay in the acquisitions of skills (Crain, 2015).

The rooting reflex and sucking reflex have prime importance in survival of child because baby sucking response will keep baby alive by breast feeding, but another very important role of rooting reflex is in the head and neck control (Neaum, 2015). As the baby peri-oral area is stimulated by touch there is rotation of neck. Every time when there is stimulation, there is rotation of neck, thus producing tone of neck muscles. Rotation of neck due to rooting reflex produces tonic neck reflexes like ATNR (asymmetrical tonic neck reflex) (Hölscher, 2014). ATNR produces tone in arms and shoulder and also its integration leads to midline control of baby. Similarly other neonatal reflexes like moro, gallant, landue, stepping, palmer grasp, tonic labyrinthine and supporting reactions all play role in development of tone and posture in baby initial six month. Most of these reflexes disappeared at the age of six month and get integrated in central nervous system. After neonatal reflexes integration, there is emergence of righting reaction in baby life. Righting reactions play very major role in development of rotatory component in development (Linhares, 2015). These reactions continue for 1 to 2 years of life and finally disappeared. Another very important reaction in development is equilibrium reactions. There reaction continues for whole life and baby leant new skills by this reaction.

There are different theories that explain the development in new born. According to neurodevelopmental modal,

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motor control refers to two systems: open loop and close loop. Open loops are sequence of movements that are stored in central nervous system and produced isolated joint and limbs movements. Open loop system creates individual muscle movements and has voluntary control. Close loop refer to mass movements and postural movements and involuntary in nature and arise from pattern of coordination. Reflex theory also explains the motor control that reflexes at initial life turned into purposeful movements during later stage of development. Another theory is hierarchical, motor control is hierarchically arranged (Gallistel, 2013). Higher center in brain have inhibitory control on lower center. Another theory named system theory, according to system theory there is no absolute control of higher centers, movements and motor control also take place on lower levels also.

Normal brain leads to normal development. And lesion in abnormal brain leads to abnormal development. Lesion in immature brain leads to abnormal tone development and abnormal postures. In cerebral palsy there is lesion in immature brain that leads to abnormal sensory-motor development. In cerebral palsy there is no integration of neonatal reflexes and delayed in motor development. Abnormal reflex movements produce abnormal synergies and abnormal posture. According to reflex theory, higher center have inhibitory effects on lower centers. In cerebral palsy this higher center control is not present and primitive reflexes persist in child life.

Primitive reflexes have very important role in development of child. These reflexes also have prime importance in assessment and evaluation. As there is brain lesion in these children, upper center do not have inhibitory effect on lower center, so there is an exaggerated reflex movements. Deep tendon reflexes show increased response on stimulation of tendon. Usually primitive reflexes disappeared at the age of six month, but in cerebral palsy these reflexes persist.

There are different senserimotor approaches of treatment like Bobath, Brunnstrom's movement therapy, Rood's approach and proprioceptive neuromuscular facilitation (Bhalerao et al., 2016). Theoretical basis of these treatments are neurodevelopmental modal, reflex theory, hierarchical theory and system approach (Bhalerao et al., 2016). Reflex integration should be major component of treatment in children with cerebral palsy.

2. Conclusion

Baby borns with maximum flexor tone; there is flexion in arms and legs. With the development, this tone is counter balance by extensor tone and body achieve an erect posture that is preliminary in acquisitions of skills. Neonatal reflexes are automatic movements in the life of every child, most of neonatal reflexes disappeared at the age of 06 month. Initial six month in baby life is very important, if theses reflexes persist, there is delay in the acquisitions of skills.

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