Simone Battibugli, Neonat Pediatr Med 2018, Volume 4
DOI: 10.4172/2572-4983-C3-008

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Diagnostic assessment of cerebral palsy and other neurodevelopmental disorders after NICU: Do not wait-and-see

Worldwide, Cerebral Palsy (CP) is the most common motor disability in childhood. CP is the result of a non-progressive lesion or injury to developing brain and has multiple causes and clinical manifestations, which leads to a very challenging discussion on diagnosis and screening. CP registers indicate the average age at cerebral palsy diagnosis is 19 months of age, however in most clinical settings the age of CP diagnosis is on average two years or older. It is well-known that delays in diagnosis of cerebral palsy are associated with worse long-term motor function, parental dissatisfaction and higher rates of physical and mental health deterioration. Infants at high risk for neurodevelopmental disorders, including CP, can be identified early, in the first weeks of life, through systematic clinical evaluation combined with specific neuroimaging, neurophysiological tests and when needed genetic testing. The most promising early predictive tool for CP is the General Movement's Assessment (GMA), which assesses the quality of spontaneous movements of infants in the first 4 months of life. However, as not all children with abnormal findings at neurological examination or on neuroimaging will develop CP, several authors recommend combining GMA with MRI. This combined assessment has been showing high sensitivity and specificity starting from the first months of life (GMA, 98% and 91%; MRI performed at term 86-100% and 89-97%, respectively). As stated by the World Health Organization, identification of the infant at risk for CP and others neurodevelopmental disorders is a crucial starting point to establish a close relationship between parents and health care providers and to provide early intervention. The broad goal of early intervention is to minimize motor, cognitive, emotional impairments, therefore the remarkable potential of the brain development between preterm age and the age of 1-year post-term offer the best opportunity for early intervention. Hence, ideally early intervention should begin when infants are still in the Neonatal Intensive Care Unit (NICU), mainly by focusing on reduction/minimization of stress factors or soon after NICU discharge. Nevertheless, the main aim of early intervention after hospital discharge is no longer stress reduction but supporting the infant's development and functional outcomes. Certainly, the best practice will involve comprehensive multidisciplinary programs based on active interventions including physiotherapy, occupational therapy, psychology and neurodevelopmental management. Brain and muscle plasticity in response to target therapies has been demonstrated in children with CP of different age ranges, confirming that neuroplasticity is a lifelong continuous process that enables the brain to change and rewire itself in response to stimulation. However, clinical and experimental findings seem to indicate that, to be maximally effective, early intervention has to be early, intensive, active, individualized and family based. Therefore, the main goal of early motor training is to optimize the development of skilled motor function and avoid musculoskeletal deformities. Poor control of muscles and movement in children with CP can be associated with a wide range of functional challenges. Traditional efforts to manage these motor disabilities have been directed at improving tone and promoting adequate motor patterns. However, contemporary approaches are directed rather to target muscle weakness and poor selective motor control, which is showing very encouraging results. Given that cerebral palsy presents at early in infancy and persists throughout lifetime, effective management must be cost efficient, family friend and based in context of community integration.

Biography

Simone Battibugli is a Pediatric Orthopedic Surgeon, currently working as Pediatric Orthopedic Surgeon at The Children's Medical Centre in Dubai. She has 10 years clinical and research experience as Faculty of Federal University of Sao Paulo. She has completed her Pediatric Orthopedic Fellowship training at Children's Hospital, Chicago, USA and also as a Fellow at Shriners Hospital for Children. Lexington, USA. Her main interest is in evidence based medicine, systematic literature review, management and clinical research on neuromuscular disorders, as cerebral palsy, spina bifida and arthrogryposis multiplex congenital and congenital foot and lower limb deformities and other congenital and acquired musculoskeletal pathologies in children.