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PEDIATRIC NEUROMUSCULAR INTERVENTION TO INCREASE MOTORIK IN AGNESIS CORPUS CALLOSUM ETCAUSA CEREBRAL PALSY

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Abstrak

Introduction: Describe clinical reports of pre- and postneurofunctional interventions in cases of agenesis of the corpus callosum. **Clinical case**: The baby was born spontaneously with a weight of 3100 g, 40 weeks of gestation and required a stimulus of applause for 10s until finally the baby cried for the first time. The baby was born with the thumb congenitally entwined bilaterally. At the initial evaluation, the child has fluctuating tone in the upper and lower extremities. Spasm in the upper trapezius, tibialis anterior and facial muscles (frontal, masseter, obricularis oris), very weak central muscles and hypotonia of the upper and lower extremities. The goals of neurofunctional intervention are to improve motor skills, improve head control, improve core ability in sitting position, and readiness to crawl. the child did not show any orthopedic deformities, but there was limited range of motion and muscle weakness and changes. **Conclusion**: Functional focused motor interventions proved to be effective, as GMFM showed an improvement in gross motor function after a short intervention period from 31 points to 48 points in the total dimension B.

Keyword: AgCC, cerebral palsy, spastic, physiotherapy

Introduction

Agenesis of the corpus callosum (AgCC) is a rare malformation of telencephalon embryogenesis, but it is a common brain abnormality. It occurs in 1-3 out of every 1000 births with varying degrees of severity and abnormalities ranging from no commissures to minimal development (1) (2). The main function of the corpus callosum is communication between the two hemispheres; different parts of the corpus callosum connect the same area in each hemisphere (3).

Etiologically, AgCC is still unclear, but there is much literature suggesting that heredity plays a role in the development of AgCC, including related syndromes. In this case, it is suspected that there is involvement of the syndrome although it has not been genetically proven, Chiappedi studies have found that between 30 and 40% of the etiology can be identified (2). According to the National Organization for Disorders of the Corpus Callosum (NODCC), most patients are diagnosed between the ages of one to two years. The abnormalities are not just one, but many factors that influence the development of CC, including: viral infection (rubella) in the prenatal period, genetics, metabolic toxicity (alcohol metabolic syndrome), anterior cerebral artery infarction, factors genetic chromosomal abnormalities found in 20% of ACC especially trisomy 18 and 13 (4). In the first case the serological examination revealed a viral infection in the case of AgCC.

The severity of the clinical symptoms of AgCC varies greatly, some of which are not recognized until adulthood (5). Some children with AgCC have developmental and physical problems that require lifelong medical attention, and possibly even require surgery (6). Other children will have normal intelligence and will only have mild neurological problems so that they can lead normal lives (3). And some children with AgCC also have other conditions such as cerebral palsy, intellectual disability, autism, or seizures (4) (2).

This study involved young children aged 2 years and 11 months who were born with ACC and were the couple's first child, G1P1A0. Parents routinely monitor their birth and take vitamins during pregnancy. The age at 27 years of pregnancy, during routine pregnancy exams the mother did not complain about anything, and the doctor who examined him said

that the contents were healthy, there was nothing to worry about. There was no history of family marriage or systemic disease.

Case repport

The baby was born spontaneously with a weight of 3100 g, 40 weeks gestation and required a stimulus of applause for 10s until finally the baby cried for the first time. The baby was born with the thumb congenitally entwined bilaterally. Appearance, pulse, grimaces, activity, respiration (APGAR) score 7/10, the baby did not pass the treatment in the NICU / PICU, there was no history of seizures. Magnetic resonance examination and viral examination were performed when the patient was 6 months after birth and showed signs of AgCC and active cytomegalovirus.

Several evaluations of the patients were carried out that were used as a neurofunctional record of a child, which consisted of: 1) identity (personal data) 2) personal history (past and current medical history, family history, related diseases and lifestyle); 3) motor behavior (reflexes and reactions, motor patterns involving symmetrical movements, transfers, movements and postural adjustments in all positions); and 4) physical examination (muscle tone, deformity, posture).

Outcome and Measurement

At the initial evaluation, the child has fluctuating tone in the upper and lower extremities. Spasm in the upper trapezius, tibialis anterior and facial muscles (frontal, masseter, obricularis oris), very weak central muscles and hypotonia of the upper and lower extremities. No joint deformity was observed. Also, the remaining reflexes: potholders, babinski, morning, neck straightening, optical straightening. balance in a sitting position without the help of hands, and crawling is also absent. Regarding the motor patterns, the following were observed: a) the upper extremities remain under the body when passing from the sleeping position to the prone position; b) full cervical extension, poor ability to reach objects. c) the patient can move from a supine position to a sitting position; d) the body line is not straight, the patient sits using the pelvis with the head more extended; e) the patient does

not move in a sitting position and needs back support to minimize falls. bilateral type; f) rich hand with the head even more extended; g) can partially follow the direction of a moving object; h) high sitting position, plantar ankle. i) move while sitting by moving the legs; j) Able to grab objects and throw them but tends to always take them to the mouth. The patient is still taking niacyamine and Omega 3 fish oil.

The intervention was carried out twice a week in 1 hour per session. Exercises in the form of END are useful to inhibit abnormal movements and promote normal movements by stimulating key points of movement, and also emphasize the development of automatic straightening reactions (8), muscle strengthening, maintenance exercises and use of standing frames to improve body structure and function (eg, reduce the risk of hip subluxation and improve bladder and bowel function), increase activity (eg, motor skills) (9), stimulation for balance and coordination and standing exercise. Mothers are actively involved in each therapy session, continue treatment and carry out exercise instructions given by the therapist at home, and parents provide freedom for children to move freely and explore many things. The intervention was carried out in a special intervention room for children using a mattress, bench, square box, toys, Swiss ball and standing table.

The reevaluation used the same measures and was performed after 8 interventions, when the child was 3 years old. GMFM demonstrated improvements in motion control in the seated segment. The most prominent points are in the sitting phase reaching the toy and the rotation of the trunk and neck with and without the help of the arm. According to the mother, the control from the supine position to the sitting position is much smoother. This position requires control of the hands, trunk and head, which means that the goals in this segment are on track to be fully achieved.

Discussion

The goal of rehabilitation in cerebral palsy patients with AgCC is to improve the general functioning of the individual. The patients in this study had bilateral congenital interlocking thumbs, which did not represent AgCC. He also has spastic cerebral palsy and intellectual disability that may be related to the corpus callosum malformation (4).

Regarding the changes that occur related or not, the importance of multidisciplinary intervention stands out. Currently, the patient has a delay in motor development that is very common in this population. However, in general, children with AgCC can also have typical development. Furthermore, this patient was also known to have active CMV at 6 months after birth and had spastic cerebral palsy. The early intervention provided allows more effective prevention of factors that can cause deformity and decreased function. Therefore, it is important to prevent secondary physical or mental complications and to maximize the plasticity of the central nervous system.

In this case, the child did not show any orthopedic deformities, but there was limited range of motion and muscle weakness, and changes in tone determined that long-term preventive interventions were needed to prevent deformities and functional limitations that could interfere with motor performance. .

These studies have shown that AgCC people with spastic cerebral palsy have significant deficits in leg strength, core strength, head control, and coordination. The importance of early intervention to consider these aspects that are intended to stimulate function. In this case report, the child showed great improvement in the mastery of motor skills. The GMFM B seated dimension, which is used as a starting measure, shows very good results.

Conclussion

Function-focused motor intervention was shown to be effective, as the GMFM showed an improvement in gross motor function after a short intervention period from 31 points to 48 points in dimension B overall. However, this cannot happen if parents do not cooperate, because the role of parents, especially mothers, is very important to improve the development of children in the family environment.

Physiotherapy research in cases of AgCC with problems such as CP is rarely discussed in scientific studies, considering that this particularity can still be classified as small. From earlier research, which discussed neurofunctional interventions for AgCC, it became a

reference for future research to be conducted with AgCC etcauses spastic cerebral palsy that facilitates spasticity.

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