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Physical therapy intervention through early stimulation in preterm infants

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ABSTRACT
According to the Ministry of Health (2021), in Brazil, approximately 340 thousand premature births occur annually, which represents an average of 931 babies per day or about 6 premature babies every 10 minutes. Premature babies are defined as those born before 37 weeks of gestation, considering that a complete gestation ranges from 37 to 42 weeks.

Keywords: Preterm births, Pregnancy, Public health.

INTRODUCTION

According to the Ministry of Health (2021), in Brazil, approximately 340 thousand premature births occur annually, which represents an average of 931 babies per day or about 6 premature babies every 10 minutes. Premature babies are defined as those born before 37 weeks of gestation, considering that a complete gestation ranges from 37 to 42 weeks.

These premature babies can be classified into three groups: "extremely premature", who are born before 28 weeks, have a fragile state of health and are more prone to death risks; "intermediate preterm infants", who are born between 28 and 34 weeks, representing the largest share of prematurity cases; "Late preterm infants", which represent babies born between 34 and 37 weeks of gestation, constitute a group of newborns whose number has shown a significant increase in Brazil in recent years. This phenomenon represents a considerable challenge in terms of public health (MINISTRY OF HEALTH, 2021).

Uterine development is responsible for the sensory and motor maturation of the baby, when early birth occurs, the newborn's body becomes immature, and may present a Neuropsychomotor Development Delay (ADNPM). For the follow-up of these children, there is the early stimulation protocol, a clinical-therapeutic care and intervention program, in which a multidisciplinary approach occurs with children aged 0 to 3 years, with the aim of providing sensorimotor experiences to develop their maximum neuropsychomotor functionality (BARBOSA et al., 2022).

The physiotherapist, in turn, has great importance in the composition of the multidisciplinary team, acting early, with the objective of avoiding motor and sensory damage, minimizing the complications and sequelae of early birth. Physical therapy contributes to the development and growth of the neonate,

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promoting the reorganization of muscle tone, inhibition of inappropriate postural patterns, increased sensitivity, proprioceptive stimulation, and prevention of possible musculoskeletal abnormalities and ADNPM (SANTOS; OF THE SAINTS; DOS ANJOS, 2023).

OBJECTIVE

To compare the effects of early stimulation in preterm infants compared to those who did not undergo physical therapy intervention.

METHODOLOGY

This is a literature review study on the comparative analysis between premature babies submitted to early stimulation and those not submitted to physical therapy intervention. Searches were conducted in the main databases such as *Scientific Electronic Library Online* (SciELO), Latin American and Caribbean Health Sciences Literature (LILACS), *Physiotherapy Evidence Database* (PEDro), Embase, PubMed and *Virtual Health Library* (VHL) for the composition of the study as a way to describe early stimulation in premature babies. Articles in Portuguese and English referring to the years 2019 to 2024 were included. And with the following Health Descriptors (DEC's), in Portuguese: "Early Stimulation"; "Premature Newborn"; "Physiotherapy Specialty"; "Motor Skills Disorders"; "Growth and Development", and in English: "*Early Stimulation"; "Premature Newborn"; "Physiotherapy Specialty"; "Motor Skills Disorders"; "Growth and Development*". As this is a literature review that does not require data collection on human beings, it does not require submission to the Research Ethics Committee (REC).

DEVELOPMENT

Child development is made up of broad factors that interact with each other, psychological, biological, and sociocultural aspects, and the progression of one of these domains reflects on all the others. Development is defined as an orderly, organized and detailed sequence of progressive and successive transformations that encompass the complexity of the perfect functional conjugation between body and mind (LANZA; GAZZOTTI; PALAZZIN, 2019).

One of the biological factors that can influence development is prematurity, when the baby is born before completing 37 weeks of gestation. Preterm birth may be more prone to neurodevelopmental delays due to the immaturity of the nervous system, they also have a higher chance of developing cerebral palsy, blindness, developmental and learning problems (DA ROSA et al., 2019).

Full-term neonates without specific neurological or genetic disorders usually have hypertonic physiological flexor patterns of the limbs, capable of a wide range of movements in an extension pattern, involving yawning, stretching, and twisting. During this period, the child is constantly stimulated and

challenged to spontaneously learn the ability to control the cervical and trunk (LANZA; GAZZOTTI; PALAZZIN, 2019).

It is known that the lack of stimuli in the first days of life can lead to *deficits* in sensory adaptations, as well as delays in the child's neuropsychomotor development. Therefore, it is customary to intervene early when a baby presents psychosomatic or developmental disorders or in a state of psychic risk. The intervention is considered early when it is started before the atypical posture and movement patterns have been installed, that is, the first four months of the baby's age would be the essential time to start the program. Early treatment is indicated as a way to increase the interaction of the organism with the environment, obtaining motor responses close to the normal standard and preventing the learning of atypical patterns of movement and posture (FREITAS; SOFIATTI; VIEIRA, 2021).

Physical therapy, through early stimulation, plays a crucial role in facilitating the development of motor skills, improving the baby's posture, balance, muscle tone, and overall strength. Identifying and correcting any alterations, in addition to providing guidance to parents and humanizing the therapeutic environment. This approach aims to promote healthier posture by preventing anomalous movement patterns and reducing potential developmental delays. The objective is to enable functionality in daily activities and solve challenges, which directly impacts the child's quality of life (RAMOS; MÜLLER, 2020).

For the choice of therapeutic resources, it is essential to consider the most appropriate positioning for the baby, in order to stimulate more flexible movement patterns, enable centralized orientation and facilitate physical organization. As for sensorimotor stimulation, the treatment is based on regulating the functioning of the nervous system, inhibiting dysfunctional motor activities, establishing muscle tone and stimulating development. This approach is carried out in the child's daily life as an effective therapeutic tool (SANTOS; RODRIGUES; RAMOS, 2021).

Ligament and joint laxity, hypotonia, deficiencies related to coordination, gross and fine motor skills and postural balance cause a series of problems. Physical therapy, being a movement-based science, treats, improves, promotes, and stimulates these sensory, motor, and cognitive skills. Several resources and techniques, including Kabat, kinesiotherapy, Proprioceptive Neuromuscular Facilitation (PNF), Bobath's Neuroevolutionary Concepts, hydrotherapy and techniques that use manual, instrumental and motor methods can be used alone or with playful tools to promote the process of acquisition of these skills, aiming to accelerate child development in order to achieve the proposed objectives, according to each age group (SANTOS; RODRIGUES; RAMOS, 2021).

Rebelo et al., (2020), introduce current evidence on early stimulation involving motor areas and highlight that early intervention should start at the moment of diagnostic suspicion to explore neuroplasticity through specific motor training. They recommend motor training that provides effort to

solve complex problems, providing repetition and frequency of training to promote disciplined skill development. Due to the lack of scientific evidence, it is stated that passive movements should be reclusive to stimulate the active movements of babies.

According to Morgan et al., (2021), in order to provide task-specific training, enrichment, and environmental engagement, early stimulation should follow the child's order and stage of development. Babies need to be active and motivated from birth until they return home. One of the highly recommended practices to strengthen the muscles of babies is *"Tummy Time".* This technique consists of placing the baby in the prone position, always under the supervision of the guardians. In addition to promoting muscle development, *Tummy Time* provides bodily experiences that are essential for the child's confidence, both in parental care and in the surrounding environment. In short, this practice lays a fundamental foundation for the child's neuropsychomotor development.

From birth to 2 months of age, *Tummy Time* can be started by laying the child in the prone position and drawing attention with toys, pronouncing the baby's name, showing colored objects at a distance of about 30 centimeters from the child's eyes, moving them up, down and sideways, looking into the baby's eyes when he is talking, encouraging him to hold his head high. *Tummy Time* strengthens the upper limbs, lower limbs, and trunk as babies make an effort to observe what's going on around them. The practice is beneficial, recommended by health professionals, and contributes to other phases of development, such as sitting, crawling, and walking (BRASIL, 2022).

With the guidance to put babies to sleep in the supine position, aiming to reduce the risk of sudden death, many parents may feel concern about placing their children in the prone position. However, it is recommended to encourage this position while the baby is awake and under the supervision of an adult, from the first day at home. As time goes by, the period in which the baby stays in this position should be gradually increased. Dedicating a moment for the child to stay in *Tummy Time*, is of paramount importance for the baby's development, especially with regard to sensorimotor development (MORGAN et al., 2021).

The sitting posture can come from a transition from the posture on four supports, working with the muscles in general, especially the trunk and head, because the child has to stay active so as not to fall. It is worth encouraging the baby to play with his hands, placing toys above his head so that he can reach, or spreading toys so that he can explore. Stimulation through weight bearing in the lower limbs, such as, for example, placing a toy on top of a small table and helping him to fetch this toy with his hands on his waist, being able to support his feet so that they do not slide and supporting the spine, encouraging the change of posture from sitting to standing, is also very important to stimulate in this baby (SANTOS; FIORINI, 2021).

In the standing posture, the gait reflex can be stimulated, even if the first steps have not yet been observed, stimulating the elevation of the head and trunk. Stimulate gait, walking with and without support, such as, for example, locomotor work on the treadmill and on the parallel bar with or without orthosis, with the help of the physiotherapist, and other means in addition to conventional physiotherapy such as: hydrotherapy (muscle relaxation, blood circulation); the *Therasuit;* hippotherapy (stimulation of active movement, dissociation of pelvic and scapular girdles, as well as proprioception); game therapy (playful work) and games with simple goals of reach, or throwing circles into cones, fitting geometric figures into panels with the shapes of these figures, popping colored balloons according to the verbal commands of the physiotherapist, and always guiding parents/guardians, with the aim of always generating self-confidence, social integration and independence for this child (SANTOS; FIORINI, 2021).

If we want the child to move to stand, we must enrich the environment with toys that catch his attention and this toy must be placed in a high place. A child sitting on the floor is asked to pick up the toy and should stand and position themselves in a position that allows them to interact with the toy. In general, motor stimulation should follow these principles and each skill should be actively trained and performed by the child through the enrichment of the environment that will guide the goal of the motor task through the mediation of the parents who will be trained for this purpose (MORGAN et al., 2021).

In addition, the training of parents and guardians, through the multidisciplinary team, should be placed at the center of interventions, promoting positive relationships between the family and the child, to care for and enrich these environments through focused and pleasant practices, contributing to the successful acquisition of these motor skills (SCHIAVO et al., 2020).

FINAL THOUGHTS

It is expected that physical therapy intervention, through early stimulation, promotes sensory and motor maturation. Culminating in the acquisition of new skills, and consequently with the development and growth of premature newborns.

REFERENCES

Barbosa, Y. C., et al. (2022). Desenvolvimento motor em prematuros acompanhados pelo programa de estimulação precoce: Revisão integrativa. Brazilian Journal of Development, 8(5), 35920–35929. https://doi.org/10.5935/1678-2690.20220074

Brasil, Ministério da Saúde. (2022). Deixar o bebê de barriga para baixo fortalece a musculatura infantil e estimula o desenvolvimento motor. Portal do Governo Federal. Retrieved from https://www.gov.br/saude/pt-br/assuntos/noticias/deixar-o-bebe-de-barriga-para-baixo-fortalece-a-musculatura-infantil-e-estimula-o-desenvolvimento-motor

Brasil, Ministério da Saúde. (2021). Dia Mundial da Prematuridade: Mantenha pais e bebês prematuros juntos. Portal do Governo Federal. Retrieved from https://www.gov.br/saude/pt-br/assuntos/noticias/dia-mundial-da-prematuridade-mantenha-pais-e-bebes-prematuros-juntos

Da Rosa, M. I. Z., et al. (2019). Intervenção motora precoce em bebês prematuros: Uma revisão sistemática. Acta Fisiátrica, 26(3), 164–170. https://doi.org/10.5935/actafisiatrica.2019.03.006

Freitas, L. O., Sofiatti, S. L., & Vieira, K. V. S. (2021). A importância da fisioterapia na inclusão de portadores de síndrome de Down. Revista Ibero-Americana de Humanidades, Ciência e Educação, 7(4), 869–883. https://doi.org/10.23925/1677-1212.2021v7n4a2

Lanza, F. C., Gazzotti, M. R., & Palazzin, A. (2019). Fisioterapia em pediatria e neonatologia: Da UTI ao ambulatório (2nd ed.). Barueri (SP): Editora Manole.

Morgan, C., et al. (2021). Early intervention for children aged 0 to 2 years with or at high risk of cerebral palsy. JAMA Pediatrics, 175(8), 846–858. https://doi.org/10.1001/jamapediatrics.2021.2378

Ramos, B. B., & Müller, A. B. (2020). Marcos motores e sociais de crianças com síndrome de Down na estimulação precoce. Revista Interdisciplinar Ciências Médicas, 4(1), 37–43. https://doi.org/10.5935/2447-3010.20200008

Rebelo, M., et al. (2020). Desenvolvimento motor da criança: Relação entre habilidades motoras globais, habilidades motoras finas e idade. Cadernos de Psicología del Deporte, 20(1), 75–85. https://doi.org/10.5935/2317-3793.20200110

Santos, C. C. T., Rodrigues, J. R. S. M., & Ramos, J. L. de S. (2021). A atuação da fisioterapia em crianças com síndrome de Down. Revista JRG de Estudos Acadêmicos, 4(8), 79–85. https://doi.org/10.23889/1677-9011.20210408

Santos, G. C., & Fiorini, M. L. S. (2021). Importância da estimulação precoce em fisioterapia para crianças com síndrome de Down. Revista Associação Brasileira de Atividade Motora Adaptada, 22(2), 371–382. https://doi.org/10.5935/1677-4902.20220015

Santos, C. C. C., dos Santos, J. K. S., & dos Anjos, L. M. (2023). Os benefícios da estimulação precoce em neonatos internados em terapia intensiva: Uma revisão sistemática. Research, Society and Development, 12(13), 136121343119–136121343119. https://doi.org/10.33448/rsd-v12i13.14419

Schiavo, R. A., et al. (2020). Fatores materno-infantis associados ao desenvolvimento de bebês prematuros e a termo. Revista Psicologia e Saúde, 12(4), 141–147. https://doi.org/10.5935/1678-9857.20200022