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Effects Of Malnutrition On Development

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Abstract

Nutritional status is a determinant of health; therefore, all the factors that interfere with it will directly affect the well-being of any human being. In third world countries, the population tends to exceed the limits of food both downwards and upwards which probably has important implications at a general level within the human body. Among them, malnutrition, a public health problem, is considered a disease that interferes with and hinders the life and opportunities of those who are undernourished. Review articles and originals have concluded in a very radical way that nutrition during the early stages of life will tangentially affect both neurological development in the infant and in adult life, which is why the revision of this topic becomes important.

Keywords: Malnutrition; Neurodevelopment; Pshycomotor development; Pregnant

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Introduction

According to the WHO, nutrition is the intake of food in relation to the dietary needs of the organism; good nutrition is essential for good health. This allows an integral development of the infant, adequate physical condition and good development of skills and abilities.

The clinical spectrum of malnutrition will then imply the delay in the development of all these skills and of importance will limit the psychomotor process versus one in patients with adequate nutrition.

In this small review we will address the importance of adequate nutrition for development during the first years of life and even the scope that this has in adult life, we will comment on the possible damages caused by it during neurological development and we will emphasize its importance on, specifically, psychomotor development.

Methodology

A systematic literature search of the updated medical literature on the importance of malnutrition in the psychomotor development of children was carried out, using databases such as: PubMed, Science direct and Google Scholar. Descriptors such as malnutrition, neurological development, and psychomotor development were used. Both review and original articles were used, taking into account that their year of publication was less than 5 years.

Results

During the early stages of life, physical growth is affected by the nutritional and therefore nutritious procedure that is had, with positive or negative implications on the abilities and abilities that the child develops even in his adult life, both in areas of emotional, cognitive, psychomotor and linguistic interest [1].

Malnutrition is considered a public health problem, mainly in low- and middle-income countries, which generates economic, social and health complications for the families involved, at the community level and at the national level. It has the potential to impair children's neurological development in the short, medium and long term [1, 2].

Approximately 1 in five children in the world suffer from malnutrition and the complications associated with it, such as the presence of widespread inflammation and multiple infectious diseases. Although there are early and currently improved interventions, neurodevelopmental deficiencies continue to be observed, with decreased IQ, school performance and inappropriate behaviors for the rest of life [3].

To define it systematically, malnutrition is stunting below -2 standard deviations of the Z score of height for age and low weight, below -2 standard deviations of the Z score of weight for age.

Among the most important, severe malnutrition (stunting of growth < three standard deviations below the Z score of height for age) and severe underweight (< three standard deviations below the weight for age Z score) are considered to have the greatest relationship with negative effects on neurological development [4].

From the gestational period, and without taking into account the sociocultural and economic sphere, all nutritional measures should be in place to guarantee the development of the individual in training. A low level of micronutrient intake can lead to disease, disability and increase the risk of morbidity and mortality. It is for this reason that the phenomenon of malnutrition must be seen as a complex that involves not only food but also encompasses factors such as the mother's education, residence, number of children, basic sanitation, wealth and other determining factors in the possibility of feeding and feeding her own.

In the field of neurodevelopment, malnutrition is capable of affecting psychomotor development taking into account from body movements and mental or symbolic representations, affective development affecting emotions, sensations and feelings, and cognitive development in which intelligence; attention, memory, thinking and perception are involved [5].

It has been shown that, among the most important micronutrients that are related to adequate neurological development is iron. Its deficit in the period of pregnancy until the first 2 years leads to alterations in sensory, motor, cognitive and language functioning [6]. Physiologically, from the third week of gestation the central nervous system is developed and depending on the moment in which nutrition is limited, the growth of neurological structures important for psychomotor development will be affected by altering their morphology and metabolism. The hippocampus, cortex and cerebellum can be affected, the production of neurotransmitters is decreased, the myelination process is affected and with it nerve conduction, and axonal degeneration occurs, intracranial volume is reduced [7].

In the first years of life, the growth of the brain can reach almost its entirety which allows psychomotor development, including postural behaviors, coordination, locomotion, and reflexes, control of the muscles and with it the development of fine and gross motor skills. For all the above, one of the most important pillars is the nutritional status, therefore, a deficit or excess of micronutrients will affect the overall functioning of motor or cognitive functions [5].

Discussion

According to reports from the World Health Organization (WHO) in 2019, malnutrition and overweight/obesity are public health problems that coexist in much of the low- and middle-income countries and have the potential to affect neurological development, especially in children under 60 months [7].

Suryawan, et.al in 2021, conducted a systematic review of approximately 26 articles to study the impact of malnutrition and overweight/obesity on cognitive aspects of neurological development for children aged 0 to 60 months compared to normonutrites. In it, they showed that the Z-points of height for age and length for age are associated with elements of cognitive functioning such as attention, time to walk correctly, mathematical and linguistic skills, even choice of partner in adulthood, which implies the importance of adequate nutrition early in life [7].

In 2019, Calceto-Garavito, ET. They conducted a systematic review of databases to study the relationship between nutritional status and the cognitive and psychomotor development of children in early childhood. The authors concluded that both intellectual capacity and motor development depend on the nutritional status of infants and therefore there is a close relationship between the two [5].

Zamudio and Herrera-Guzmán, 2014, evaluated psychomotor alterations regarding malnutrition before and after their treatment in children aged 3 to 6 years compared to healthy children and found that despite observing improvement in their psychomotor functioning when treating malnourished children, it was of no significant value compared to that of healthy children. Therefore, despite an adequate treatment, this does not imply per se improvement and preventive programs are the ones in which we must apply more strength [8].

There are also studies examining the association between maternal nutrition during the gestation period and subsequent neurological development in the child. Cortés 2021, et. Al, analyzed 84 studies with which they can conclude that inadequate intake of nutrients during pregnancy is associated with brain defects, increased risk of abnormal behavior, neuro-psychiatric disorder, impaired cognition, visual impairment and motor deficits. [9-15]. another study evaluated the impact of nutritional supplements on the cognitive development of children in developing countries. The meta-analysis evaluated 48 studies with approximately 29,800 patients where they show that child nutritional supplementation improves the cognitive development of children, especially with more than 5 nutrients; prenatal supplementation does not improve cognitive development except when implemented during the first trimester. The authors conclude that infant nutritional supplementation is beneficial for cognitive development, but could be optimized by providing multiple nutrients; prenatal

supplementation should target pregnant women in the first trimester for better cognitive benefits [16].

Conclusion

Malnutrition is a world-class public health problem. It is capable of affecting the neurological development of children and lasting its effects until adulthood. One of the main factors that influence the above and that goes hand in hand with it is the socio-family context, since it is inherently able to contribute to the persistence of bad nutritional habits which makes the cycle persist. That is why health policies should be aimed at improving both the food aspect, and offering social and educational support that helps to face this problem. It is clear and demonstrated through studies that micronutrient deficiency, especially iron, causes damage to neurological structures that will ultimately lead to negative effects on psychomotor, affective and cognitive development.

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