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Hydrocephalus and its implications for the central nervous system: A contemporary literature review

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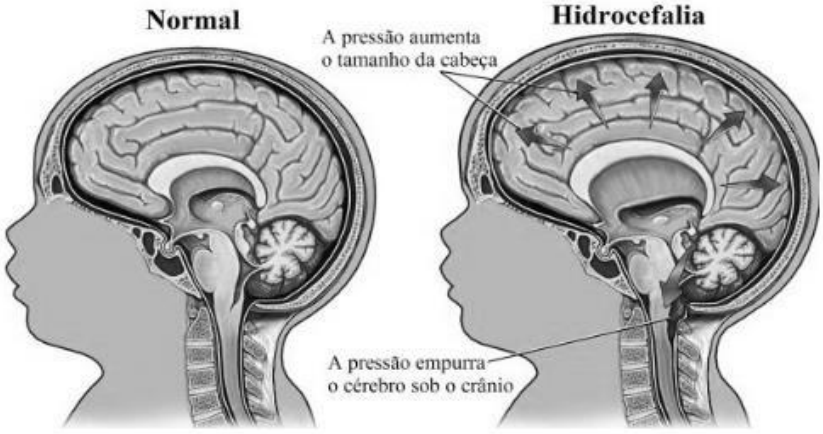
***Keywords*— Hydrocephalus, Nervous system, Clinical Assessment.**

***Abstract*—** *Hydrocephalus is a pathology characterized by the accumulation of cerebrospinal fluid (CSF) in the cerebral ventricles (intercommunicating cavities located in areas of the brain) and in the subarachnoid space between the arachnoid and pia mater membranes of the meninges. The aim of this study was to present a review of the literature, with a contemporary character, on Hydrocephalus and its implications on the central nervous system. The present research was carried out during the years 2018 to 2022 through a search of the keywords in the descriptors in Health Science (DECS) and were added in the databases: VHL (Virtual Health Library), Google Scholar, LILACS, PubMed, Scielo. In total, 08 (nine) articles were used as primary search and 33 (thirty-three) articles as secondary search. The titles of the articles included in the present study were those that presented a direct correlation with the keywords, articles up to 05 (five) years old or classic authors of the theme even with a later date. Bibliographic data, such as electronic journals and websites that clearly explain hydrocephalus. Through the analysis of the bibliographic data that were studied, it was noticed that the head of the patient with hydrocephalus suffers more visibility when talking about anatomical structure, and sequelae regarding the Central Nervous System.*

I. INTRODUCTION

The word "hydrocephalus" comes from Greek origin, giving the designs to hidro=water and cephalo=head, it is considered a disease caused in the brain, when there is excess of cerebrospinal fluid in the cerebral ventricles or also in the subarachnoid areas, being this called by the acronym CSF or even called CSF, thus causing the increase in the head due to the dilation of the ventricles.

According to Alcântara (2009) there are three types of hydrocephalus, which are: obstructive or non-communicating, non-obstructive or communicating and normal pressure. The causes of hydrocephalus can be the most diverse, more specifically the congenital and acquired, it is evident more occurrences in children and the elderly, although it can develop in other stages of life (JUCA; NETO; OLIVEIRA; MACHADO, 2002).



Fonte Imagem: Reprodução/Internet

Fig.1: *Comparison of a child with hydrocephalus, the image on the left shows a child who does not have the disease, and on the right, with the disease and the places where there is accumulation of fluid, in which the anatomical structure of the head is the most visible, due to pressure cerebral ventricular.*

The evaluation of symptoms for this disease is according to age, but the most visible are: the different size of the head, vomiting, drowsiness, irritability, convulsions and in more serious cases: mental and psychomotor retardation. The diagnosis is made through a clinical history of the person, computed tomography or magnetic resonance imaging. The form of treatment can be done with medication and, in most cases, surgery is performed, in which the obstruction occurs by drainage for the removal of the liquid.

The search to research on this topic arose after the curiosity to know and deepen more about the implications that occur in the Central Nervous System (CNS) when a patient is diagnosed with hydrocephalus, and for that important information about the disease was addressed, from of a bibliographic survey.

The following study is of great relevance to the medical field, as it is a research in which studies were concentrated on the Central Nervous System, since this is the part most affected by hydrocephalus. It can serve as a basis for future works that have the same tenuous line of medical research.

The study on hydrocephalus and its implications on the central nervous system had as main objectives to understand the disease in general, from the etymological meaning of the word to its treatment, with the support of bibliographic materials and careful analysis. And also the description of the main implications of hydrocephalus in the Nervous System.

II. THEORETICAL REFERENCE

From the anatomical point of view, hydrocephalus has as main deformities that are according to the type of disease and whether the patient is a child or elderly, and the Central Nervous System is the most affected. Enlargement of the head is the most visible, and per hour present more in children's cases, although this is not restricted to occur in young people, adults or elderly people.

Hydrocephalus has no cure, but advances in health have made the treatment increasingly effective, and there are cases in which the person after surgery is even able to lead a normal life.

Because hydrocephalus occurs in two ways: congenital and acquired, the cause of both is given by different situations. While in congenital the main origin is when the child is still in the mother's uterus. And other appearances are diagnosed after birth, preferably in the first few months of the baby. In addition to diagnosis at birth, it is common to appear due to infections, such as meningitis and toxoplasmosis. If the child's mother used drugs during pregnancy, this cause is also common. And other causes are: spina bifida, known by the scientific name-myelomeningocele, and non-formation of the spinal cord. (ALCANTÂRA, 2009)

Unlike congenital, acquired has no specific age for onset. And the causes are diverse: head trauma (due to a car accident or fall in which the head impacted the ground or similar object was too strong), brain tumors, infections and hemorrhages, including a stroke/ AVE (PEREIRA; MAZETI; LOPES; PINTO, 2012).

Excess CSF in the skull compromises the anatomical structure of the head, especially the oversized head, which results in cerebrospinal fluid when it is produced beyond the brain and spinal cord need, the cerebral ventricles, which are four in total, suffer pressure,

causing the head shape to increase, and cause problems in the Nervous System (ALCANTÂRA, 2009).

These problems often occur according to age: in children we can identify: slow psychomotor development, irritability and a large head, as described above. In adolescents and adults: frequent headaches, lack of attention and concentration, convulsions, lack of balance in the body. In the elderly: difficulty walking, state of dementia and memory loss (JUCA; NETO; OLIVEIRA; MACHADO, 2002).

III. MATERIAL AND METHODS

The research was carried out during the years 2018 to 2022 through a search for keywords in the descriptors in Health Science (DECS), using the words: Hydrocephalus; Nervous system; Clinical Assessment.

They were used in the VHL, Google Scholar, LILACS, PubMed and Scielo databases with a filter for publications from the last 05 (five) years and research in humans. However, classic articles that supported the key subject were kept despite the year of publication.

In the VHL (Virtual Health Library) database, 04 (four) were found and 01 (one) was used. In Google Scholar, the first 200 (two hundred) of a total of 6,680 (six thousand six hundred and eighty) were observed, taking advantage of 03 (three). In LILACS, 07 (seven) were observed but none were used. In PubMed, 128 (one hundred and twenty-eight) were found, in which 04 (four) were used. In the Scielo database, only 01 (one) article was found and the same article was used. In total, 08 (nine) articles were used as primary search and 33 (thirty-three) articles as secondary search.

The titles of the articles were analyzed and those that presented a direct correlation with the keywords, articles up to 05 (five) years old and with research in humans, were included in the present study. The others were automatically excluded.

IV. RESULTS AND DISCUSSION

It was observed that Hydrocephalus, due to the CSF fluid that is present in our brain, and when it exceeds, there is a lack of control of the necessary total produced, causing at a time the encephalic enlargement and other consequences, which mainly affects the Nervous System. Central.

It can be verified through the information studied about the disease that there is no cure, but treatment, with the use of obstruction of the liquid through drainage. It is notorious that when hydrocephalus affects the Nervous System, the patient has psychomotor difficulties, a large head (in which there is dilation of the cerebral ventricles), memory loss, drowsiness, headaches, irritability, lack of concentration, etc.

The most common cases are in children, preferably newborns, and when the disease is detected as soon as possible, the more chance there is to take care and take appropriate measures. Although there are records in the elderly, adults and adolescents. Based on the studies pointed out by Alcantâra (2009), when it is noticed that the baby has a head of a different size than normal, it should measure to see if the growth will not continue, and if it continues to apply medicine to reduce the continuous production of the baby. cerebrospinal fluid.

V. FINAL CONSIDERATIONS

The analytical study on Hydrocephalus and the main implications on the Central Nervous System, addressed what the disease is, how to treat it, what are the most common cases, diagnosis, types, emphasizing the most impaired anatomical structure.

Cerebrospinal fluid, when produced in proportionate quantity, is very important to avoid the impact of our nervous system with the bones, but when it produces more than necessary, it causes the disease which is called Hydrocephalus. This fluid causes the ventricles to dilate and the head to become larger than normal.

It has treatment, both with drugs and surgery. The detection of hydrocephalus is taken with the help of computed tomography, magnetic resonance imaging and others. And the sooner it is diagnosed, the better the chances of treating it. There are three types of hydrocephalus: obstructive or non-communicative, non-obstructive or communicative, and normal pressure. And as much as hydrocephalus has no cure, medicinal treatments have been increasingly effective.

Thus, it can be noted that hydrocephalus, despite being a little better known, there are still few studies describing with more precision and clarity about the problems caused in the Central Nervous System, and that better address the CSF disorder that causes hydrocephalus.

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