Available online at: http://lumenpublishing.com/proceedings/.../rec-november-2017/
Volume 1, Issue 1, October 2017, pp. 157-163

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RCE2017, June 9-10, 2017, Galati, Romania

Risk in Contemporary Economy

Strategic Management of Cerebral Arachnoid Cysts in Children in the Era of Globalisation

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https://doi.org/10.18662/lumproc.rce2017.1.13

How to cite: Cojocaru, E.-M., & ù WHI QH9. (2017). Strategic Management of Cerebral Arachnoid Cysts in Children in the Era of Globalisation. In S. Hugues, & N. Cristache (eds.), Risk in Contemporary Economy (pp. 157-163). Iasi, Romania: LUMEN Proceedings. https://doi.org/10.18662/lumproc.rce2017.1.13

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International Scientific Conference Risk in Contemporary Economy | RCE 2017 | 9-10 June 2017 | Galati – Romania

Strategic Management of Cerebral Arachnoid Cysts in Children in the Era of Globalisation

Eva-Maria COJOCARU[1]*, Victoriţa ŞTEFĂNESCU[2]

Abstract

Introduction: Arachnoid cysts in children are incidental or symptomatic findings which can have associated neurological pathologies in children. Epileptic seizures and headache are by far the most common symptoms associated to arachnoid cysts but they can also associate cerebral palsy or facial dwarfism. Objectives: In the era of globalisation we want to highlight the importance of modern diagnostic procedures and long term strategic management of children with arachnoid cysts in order to rise their social competence and have a better quality of life. Material and methods: We searched the most important theories in the literature and the new methods in the management of the arachnoid cysts. Results: Even if surgical is necessary just in few cases, medication is needed for epileptic seizures. Many children receive neuroprotective agents while other receive antiepileptic drugs for the concomitant or associated epilepsy. For speech difficulties and movement disorders speech therapy, physical therapy and other further support is needed. Discussions and conclusions: The EEG patterns are not mandatory identic to the site of the cyst. Facial dwarfism and other genetic hallmarks need to be further investigated for rare syndromes associated to cerebral arachnoid cysts. The arachnoid cyst could be a hallmark that children brain can be more sensitive to seizures.

Keywords: *arachnoid cyst, children, strategic management, globalization, structural marker.*

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https://doi.org/10.18662/lumproc.rce2017.1.13

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1. Introduction

Arachnoid intracerebral cysts in children are a pathology which was not been presented very often until now and there are few series of children investigated in Europe. Because of the imaging procedures more and more data are collected about the cerebral arachnoid cysts. We can see arachnoid cysts like space occupying processes. So they can give raise to symptoms like headache, vertigo, dizzines, nauseea, psychiatric disturbances and in more advanced stages cranial hypertension. Symptoms are progressing slowly but there can be situations for example head trauma or infection when symptms suddenly appear and then the vomiting is due to another cause, but the arachnoid cyst has the role to precipiatate the symptoms (hours, days).

2. Theoretical Background

Arachnoid cysts are cavities with liquid content of cerebrospinal fluid, with communicating or not with the internal or external liquid spaces (subarahcnoid space or the ventricles) so they are opened or closed, congenital or gained , with a large etiology [1]. They can appear anywhere on the cerebrospinal axis.[19] Arachnoid cysts can be defined also as congenital anomalies of the nervous system and appear virtually in all places where arahnoid membrane exists. [6] Even they are incidentally discovered , they must be managed.[10]. Some of them are gained through life [20]Arachnoid cysts are not the same with the false cysts formed because of cerebrospinal liquid accumulation in which there are inflammatory cells and hemosiderin , after head trauma and generating enlargement of the subarachnoid space.[15]Arachnoid cyst is described by other authors as a developmental anomaly of the leptomeningeal membrane , usually supratentorial, and located in between the leptomeningeal membranes or in between the arachnoid and piamater. [16] Arachnoid cysts are recognised more easily by imagistic methods (more often accidentally) and they are defined also as a well circumscribed tissular defect and filled with an liquid similar to the density of the cerebrospinal liquid. (Gandi and Heier),[17] Arachnoid cysts can be discovered also in adulthood because they didn not give raise to symptoms until then.[13] Arachnoid cysts are characteristic images with an noncalcificated appearance, of low density, like extraaxial masses, with irregular margins, and no contrast charge[3]

3. Argument of the paper

Arachnoid cysts are generating anxiety to parents, and once we discovered them itţs important to explain to parents the inclusion to the benign tumour group , so to explain their nonmalignant character. Also we must define their congenital origin and to explain how the child could have this cysts in his head. When they coexist or are making part from an genetic syndrome we must explain exactly the syndrome to the parents and the mode of inheritance so they know exactly from where they are.

4. Arguments to support the thesis

The cyst formation is intense studied by scientists this mechanisms must be known by physicians for to explain the parents the origin and the genesis of the arachnoid cysts and to reduce the feelings of guilt and anger of the family that they did not found the condition of the child earlier .These mechanism allow the physician to understand the symptoms, and that is sustaining the theory that arachnoid cysts are structural cerebral marker in the child neurology pathologies. The presence of the arachnoid cyst is not putting the child in danger in all cases but it can show that at biochemical and molecular level in the brain of the child are existing subtle subclinical and electrical signs which after that can grow to clinically evident symptoms which can affect the daily life of the child. In the global era the communication between specialised team can make connections and exchanges to a better understanding of this pathology, and the anywhere in the world than can be standardised procedures to manage the child with arachnoid cysts. There can be developed scales of the gravity of the arachnoid cysts pathology in children as also there can be compared the quality of life through scales for this children. The knowledge in relation to arachnoid cysts is a protecting factor for the future of the child , so that the family agrees to have for the child the best life style related to his condition. So the child will educated in a strategic manner to avoid some substances which can stop the optimal neuronal and brain development.. A mechanism of the enlargement of the of the cysts is the secretion of the cyst wall cells together with a valve like mechanism and liquid movements compared with the pulsation of the veins. [12]

5. Arguments to argue the thesis

In populations over 79 years old the prevalence of arachnoid cysts is 2,3% and without significant differences between men and women. The authors showed that the individuals included in their study with or without arachnoid cysts had the same frequency of headache , dizziness, cerebral traumatic events, cognitive impairment and cognitive and depressive symptoms[14] Arachnoid cysts of the posterior temporal fossa are associated with partial temporal lobe agenesis and now there are argues if the temporal lobe agenesis is responsible for the cyst formation or if the agenesis is the consequence of the cyst formation[9] There are rare situation with de novo cyst formation [7]

6. Dismantling the arguments against

Arachnoid cysts are representing just 1% from space occupying formations and a part of them ¼-1/3 are located in the posterior cerebral fossa, and is the second location after the middle cranial fossa [3] The most frequent location in children is the sylvian fissure and the middle cerebral fossa. [12] The cvadrygeminal cysts represent 5% in children and 10% in adults. [8] Studies on children in particular clinic situations like headache can include the following: in children with headache arachnoid cysts are represented up to 1-3% while in other studies their prevalence is 2,3%. In autopsied children the prevalence was 0,17% and in the autopsied newborns their prevalence was 0,5% from the general autopsies. [18] The rapid detecion in fetuses lead to better answers form the doctors to parents concern. [4] The first two decades of life represent the timespan when arachnoid cerebral cysts are detected. A male prevalence was reported . The sylvian fissure and the middle cranial fossa were in half of the cases the most frequent location after this authors. [15] The cyst formation is intense studied by scientists this mechanisms must be known by physicians for to explain the parents the origin and the genesis of the arachnoid cysts and to reduce the feelings of guilt and anger of the family that they did not found the condition of the child earlier. These mechanism allow the physician to understand the symptoms, and that is sustaining the theory that arachnoid cysts are structural cerebral marker in the child neurology pathologies. The presence of the arachnoid cyst is not putting the child in danger in all cases but it can show that at biochemical and molecular level in the brain of the child are existing subtle subclinical and electrical signs which after that can

grow to clinically evident symptoms which can affect the daily life of the child. In the global era the communication between specialised team can make connections and exchanges to a better understanding of this pathology, and the anywhere in the world than can be standardised procedures to manage the child with arachnoid cysts. There can be developed scales of the gravity of the arachnoid cystic pathology in children as also there can be compared the quality of life through scales for this children. The knowledge in relation to arachnoid cysts is a protecting factor for the future of the child , so that the family agrees to have for the child the best life style related to his condition. So the child will educated in a strategic manner to avoid some substances which can stop the optimal neuronal and brain development. Researchers believe that the most cases of arachnoid cysts are developmental malformations gained due to rupture of the arachnoid membrane. In the literature are cases with are in more members of the family .A mechanism of the enlargement of the of the cysts is the secretion of the cyst wall cells together with a valve like mechanism and liquid movements compared with the pulsation of the veins. [12]The cyst wall has lamelar colagen in composition[8] The cystic lesions appear in the places where more arachnoid membranes exist and the predilect localisation in Sylvian fissure, suprasellar region, cvadiregeminal lesion, cerebello-pontine angle and the cysts of the inratentiorial midline[18] Tehe păosterior fossa cysts are near the cerebellar convexity. The craniocevical cysts (craniospinal) are located in the basis of the posterior fossa and are extending in the cervical channel. The symptoms of craniocervical cysts are due to craniocervical compression and secondary hydrocephaly [6] There exist the hyptothesis of the two mechanisms of arachnid cyst formation in which the combination of an embrilogic defect of the arachnoid membrane formation is followed by an second evetn and perturbs the cerebrospinal fluid resorbtion in early childhood, thus influencing an anormal dynamic of the cerebrospinal fluid and the lichid expansion in the subarachnoid space[11] Arachnoid cysts are discovered after a fisrst seizure and more research is made to show that some type of seizures are associated with arachnoid cysts and that the two conditions can be not just incidental and there can be a genetic or biochemical mechanism. Authors form Turkey have reported a new recessive syndrome with pahygiria and arachnoid cysts and mental retardation and epilepsy found in a family. [5] Intracerebral cystic lesions are very attractive for minim invasive neurosurgery for the minimal lesions with this technique [21] Microsurgical fenestration of the arachnoid cysts of themiddele cerebral fossa is safe .After this surgery hygroma can develop but the cyst is silent after surgery and children were symptoms free. [2]

6. Conclusions

The EEG patterns are not mandatory identic to the site of the cyst. Facial dwarfism and other genetic hallmarks need to be further investigated for rare syndromes associated to cerebral arachnoid cysts. The arachnoid cyst could be a hallmark that children brain can be more sensitive to seizures. The arachnoid cysts per se are not treated with medication. Strategic management includes more type of therapies. In the global era the exchange of specialists and new therapies can be obtained all over the world. But the conditions associated with the status of a child having arachnoid cyst are treated. So are epileptic seizures which are treated with antiepileptic drugs, migrains, headache also with drugs. This therapies raise the child quality of life.. Other drugs are neurotrophic agents like Omega 3, B group vitamins, antioxidants. Other therapies include psychologic therapy, physical rehabilitation if there is coexisting cerebral palsy, speech therapy if language disorders are prezent , specific therapies for mental retardation. The life regimen exclude substances which can lead to seizures or other symptoms for example coffee, cacao chocolate and even if the Electroencephalogram is not disturbed we arachnoid cysts can be a structural marker of the vulnerabilisation of the brain.

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