

HISTORICAL ASPECTS REGARDING THE HYDATIC DISEASE

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Abstract: Having a history of existence of over two thousand years, according to documented studies, the hydatic disease, also known as echinococcosis, echinococcal disease or hydatidosis, represents still a systemic parasitic infection of great importance to the medical world. As most of the parasitic infections, echinococcosis can be achieved due to extremely easy direct path of contamination. Its existence as pathology could be detected and described ever since very old times like Antiquity (in Ancient Egypt, Ancient Greece, the Jewish Period, Ancient Rome) and Middle Ages, continuing with proofs of its persistent existence from the 16th, 17th, 18th and 19th centuries, within the Modern Era, and from the Contemporary Era.

Keywords: hydatic disease, echinococcosis, Antiquity, Middle Ages, Modern Era

I.INTRODUCTION:

Having a history of existence of over two thousand years, according to documented studies, the hydatic disease, also known as echinococcosis, echinococcal disease or hydatidosis, represents still a systemic parasitic infection of great importance to the medical world. The name of the disease finds its etiology in the Greek word "ydatos" referring to water, due to the association dating since ancient times between the primordial element and the content of the hydatic cysts—a clear watery fluid (1). There are two main types of echinococcosis: cystic (found in animal and human remains dating from Antiquity) and alveolar (firstly identified as disease in the nineteenth century), each of them caused by a separate parasite of the Echinococcus type: Echinococcus granulosus (E.granulosus) in the case of the first manifestation and Echinococcus multilocularis (E.multilocularis) regarding the second one (2), (3).

The life cycle of the parasite requires the existence of two hosts: intermediate (sheep or swine) and final (dog, fox or even humans, accidentally). The infection is transmitted through the ingestion of the eggs of the parasite, usually eliminated with the faeces (4). Then eggs become infective within the host, releasing larvae that, passing through the intestinal wall, develop hydatic cysts in multiple locations within the body, such as: heart, lungs, brain, spleen, bladder, spinal cord, making the disease a systemic one. In what regards the hydatic cyst, there can be identified four stages of evolution: the first stage with uncharacteristic symptomatology, the second stage with clinical and paraclinical manifestations, the third one marked by the presence of complications and the fourth stage consisting in post-operative/post-surgery complications. The multiple hydatic cysts are encountered mainly in the cases of children of small ages, and in the case of adults, where the cyst can grow in dimensions excessively without determining a specific symptomatology. The localization of the cyst (thorax, abdomen, brain, etc) has a particular major importance, as the cysts being able to remain asymptomatic for a

long period of time, with a viability of over 50 years from the moment of the diagnostic. The exogenous vesicles can be expelled at the exterior of the cyst and can metastasize in the entire organism (3),(5).

Turning an eye to the past, the most common geographical areas for the existence of the hydatid disease remain the Middle East, Australia, Latin America, South Africa, Central Europe and some Mediterranean locations (2).

As most of the parasitic infections, echinococcosis could be detected and described ever since very old times like Antiquity (Ancient Egypt, Ancient Greece, Ancient Rome) and Middle Ages, continuing with proofs of its persistent existence from the 17th century, the 18th century, the Modern Era and Contemporary Era, mainly due to the very easy direct ways of contamination in the case of these infections (6).

II. EVIDENCES OF THE HYDATID DISEASE FROM ANTIQUITY AND MIDDLE AGES:

In Ancient Egypt, among the numerous parasitic infections that the Egyptians suffered from, hydatidosis occupied an important position, evidences of its existence being noticed in the cases of the mummy 22940 part of the Manchester Museum Mummy Collection, the mummy of Asru still presented to the Manchester Museum (presenting hydatid cysts localized in the lungs) and according to the Ebers papyrus (circa 1800 B.C.), the Edwin Smith papyrus (circa 1600B.C.) , Hearst papyrus (circa 1600 B.C.) and the London Medical papyrus (circa 1300 B.C.), that are Ancient preserved historical documents (1).

Among the first references regarding this pathology , we mention Hippocrates of Kos (460 B.C.-370 B.C.), the Ancient Greek physician belonging to the Golden Age of Pericles, according to whom the ruptures of the cysts give systemic infection. He used the expression ‘liver filled with water’ regarding the hydatid disease, being founder of the Hippocratic School of Medicine in Ancient Greece. Aretaeus of Cappadocia (1st century C.E.), another Ancient Greek physician, wrote in Ionic Greek on the hydatid disease and other pathologies, this representing a valuable medical relic of the Ancient times (9),(6).

Other Ancient references to the hydatid disease belonged to Galen of Pergamon (129-200 A.D.) and Rhazes (860-932 A.D.). Galen of Pergamon (Aelius Galenus or Claudius Galenus) brought major medical contributions to the Ancient Roman world, among his writings being mentioned reports and descriptions of hydatidosis. Rhazes, the famous Persian scientist, an important figure for the Islamic medieval world, described echinococcosis and its consequences in the body. The hydatid cyst was seen as a gland that had grown in dimensions, on its way of involution, as a purulent collection or as a termination of blood vessels. Avicenna (980-1037 A.D.), still an Islamic personality and philosopher wrote about hydatidosis and other pathologies involving parasitic infections in his Canon of Medicine, a complex medical document and historical relic from the Middle Ages. The book was written following the medical principles of Galen and Hippocrates, therefore its importance as a continuity of the Ancient medical thoughts (1), (2).

As remains from the Middle Ages, there have been as well discovered calcified cysts preserved in the thorax and abdomen, coming from eight medieval people. The archeological-medical discovery on the territory of Skriðuklaustur, Iceland, highlighted a hydatid cyst of 17–20 cm in diameter, dating from 1493–1554 A.D. (7).

III. DISCOVERIES REGARDING ECHINOCOCCOSIS FROM THE 17TH AND THE 18TH CENTURIES

1. THE 17TH CENTURY-FRANCESCO REDI, EDWARD TYSON, G.B. MORGAGNI: In the 17th century, there were made the first researches towards discovering the causes of echinococcosis, by Francesco Redi, an Italian scientist. In his study “Esperienze Intorno alla Generazione degl’Insetti” published in 1668, Redi revealed the animalic origin of the disease. The British physician Edward Tyson, seen as the father of comparative anatomy in the context of history of medicine, mediated the fact that the hydatid cysts were containing within insects or worms in embryonic stages. The Italian anatomist Giovanni Battista Morgagni (1682-1771) gave post-mortem reports of the hydatid cysts he could find in patients. One particular important mention was the one of a hydatid cyst localized retroperitoneally, near the left kidney (1).

2. THE 18TH CENTURY-PETER SIMON PALLAS, JOHN HUNTER, A.E. GOEZE, EDWARD JENNER: The parasitic origin of the malady was described by Peter Simon Pallas (1760) who discovered the mature form of the parasite, localized intestinally and delivering vesicles. John Hunter, a Scottish surgeon, operated with meticulousness and scientific curiosity, being the one describing in 1773 the morphology of the hydatid cyst. A.E. Goeze (1782) mentioned the presence of the scoleces (“heads”) in the interior of the proliferating vesicles. He also established microscopically the granulations of the helminthic scoleces, describing also the crown arranged and divided this genus in visceral teniasis and intestinal teniasis, these belonging still to the Cestodes class like Echinococcus). The British naturalist and physician at the countryside, known for the cowpox vaccine, Edward Jenner realized a record of his dissections of several farm animals, offering important information regarding hydatidosis, as pathology (9).

IV. HYDATIDOSIS IN THE MODERN ERA: The term of echinococcus was used for the first time by the Swedish naturalist Karl Asmund Rudolphi in 1808, after he established the ways of intrusion of this parasite within the host. He also described within this genus the existence of three species: Echinococcus hominis (E. hominis), Echinococcus simiae (E. simiae), Echinococcus veterinorum (E. veterinorum). In 1855, Gottlieb Heinrich Friedrich Kuchenmeister (1821-1890) described two forms of echinococcosis caused by E. scolicipariens and E. altricipariens that were forming the protoscolex and the daughter cysts (8). For the first time, Bremser (1821), Budd (1857) and Bright (1861) described the cystic form of the parasite, discovering the development of the secondary hydatid cysts through two mechanisms: the accidental rupture of the cysts and the puncture of cystic tumors (9), (10). The asexual cycle of development of the Echinococcus without intermediary host was mentioned by M.G. Stadničkii (1890), A.I. Lebedeva and N.I. Andreev (1899), noticing that the “hydatid sand” could be source of infection, managing to contaminate the animal hosts with the content of the larvocyst. The important steps in what the etiopathogeny, diagnosis and treatment of the pathology are regarded were made at the beginning of the XXth century, by F. Deve, considered today the founder of modern histology. He described secondary echinococcosis and highlighted, as well, certain aspects linked to several pathologies

like hydatidic pleurisy. The first half of the XXth century brought into discussion the alveolar form of echinococcosis and academic studies referring it were made. The diagnosis of hydatidosis was revolutionized by the discovery of the X-rays by Roentgen (1895), remarkable radiological studies being made by Antoine Beclere (1856-1939), as well (6), (9).

V. THE IMPORTANCE GIVEN TO THE HYDATIDIC DISEASE IN CONTEMPORARY TIMES: The appearance of the enzyme-linked immunosorbent assays (ELISA), introduced in 1971, eased considerably the identification of echinococcosis. The beginnings of the Computer tomography (CT), the ultrasound examination, the magnetic nuclear resonance (NMR) contributed in the last decades of the XXth century to the specification of the diagnosis of the hydatidic cyst, in its numerous locations. In the last half of the XXth century, these discoveries led to the identification of more species of Echinococcus: E. felidis Ortlepp (1937), E. intermedius Lopez-Neyra (1943), E. longimanubrius Cameron (1996). Still, in this period, there existed a passing to biochemical, ontogenetic and etiological studies, used for the characterization of different populations predisposed to hydatidosis, the taxonomy and speciation of this genus having been suffered modifications meanwhile (6),(9).

VI. CONCLUSION: The continuous growth of morbidity through echinococcosis, both in the case of the population and the case of the animal world, confers actuality to this pathology, from an ecological point of view, and the increased number of populational migrations contribute in an important manner to the erase of the notion of “endemic area” in the case of hydatidosis. Regardless all the modern technological therapeutic successes, even at the actual present state, the medical world is often being confronted with diagnosis issues imposed by this pathology (11),(12),(13).

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