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PATHOGENESIS AND IMMUNE RESPONSE IN CARDIAC ECHINOCOCOSIS

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ANNOTATION:

Cardiac echinococcosis is a rare but serious disease caused by the parasitic helminth Echinococcus. granulosus , which locates the heart muscle. This article assumes the pathogenesis of this disease and an allergic immune system to the infection.

In cardiac echinococosis, parasites enter the heart muscle and cause the formation of hydatid cysts. These cysts lead to structural changes in the heart and disruption of its functions. Pathogenesis includes the interaction of the parasite with the tissues of the heart, its ability to penetrate tissues and form cysts, as well as phenomena associated with tissue destruction and the occurrence of an inflammatory response.

The immune system plays an important role in protecting the body from infection. With cardiac echinococosis, the immune response is activated and various cells and mediators are involved in the fight against parasites. T-lymphocytes, macrophages, neutrophils and other cellular immune systems play a role in responding to parasites and limiting their spread. However, Echinococcus parasites develop under conditions of immune response evasion strategies such as modulation of the host immune response and formation of hydatid defenses, allowing them to control complete prevention and maintain causes of harm.

A better understanding of the pathogenesis and immune response in cardiac echinococosis is important for the development of new cases for the diagnosis, prevention and treatment of these diseases. Research should be aimed at discovering more detailed mechanisms of interaction between the parasite and the immune system, as well as identifying the emergence of approaches to detecting this disease.

key words

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cardiac echinococosis, granulosa echinococcus, pathogenesis, immune response, hydatid cysts

Materials and methods of research

The pathogenesis of cardiac echinococcosis includes several foci, spread with the penetration of the parasitic helminth Echinococcus granulosus into the heart muscle. The main stages of pathogenesis include:

●Infection and entry: Echinococcus larvae enter the body through ingestion of food or contact with infected animals. In the case of cardiac echinococcosis, echinococcus larvae enter the heart muscle through the bloodstream or the trunk system.

● Development of hydatid cysts: In heart failure, the larvae begin to multiply and hydatid cysts develop. These cysts are vesicular structures, carbohydrates and protoscolexes, leading to structural changes in the heart.

●Effect on cardiac function: Hydatid cysts, increasing in size, create mechanical pressure on the heart muscle and surrounding tissues. This can lead to disruption of the normal functioning of the heart, including changes in the contractility of the heart and the deviation of arrhythmias.

●Inflammatory response: The presence of hydatid cystic inflammation is an inflammatory response from the immune system. Inflammation involves the activation of various immune cell phages, including macro- and lymphocytes, and the release of inflammatory mediators. This inflammatory response aims to eliminate the parasite, however Echinococcus parasites have developed evasion mechanisms that eliminate immune cell rejection.

● Development of complications: Cardiac echinococcosis can cause various complications, including heart failure, thrombosis, embolism, and vomiting of hydatid cysts.

Understanding the pathogenesis of cardiac echinococcosis is essential for the development of effective diagnosis, prevention and treatment of this disease. A deeper study of the molecular and immunological mechanisms of the pathogenesis of cardiac echinococcosis may illustrate the development of new therapeutic approaches aimed at suppressing infection, stopping the development of hydatid cysts and restoring heart function.

The immune response plays an important role in protecting the body from parasitic infection in cardiac echinococosis. Upon contact with Echinococcus larvae, the heart muscle activates the immune system, which mobilizes various cells and mediators to fight infection. However, the parasites to Echinococcus also develop evasion strategies, completely eliminate and persecute harm. Key aspects of the immune response in cardiac echinococosis include:

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●Macrophages and neutrophils: Macrophages and neutrophils play an important role in phagocytosis and infection of echinococcus larvae. They become activated and migrate to the area of infection, where they engulf and break down the parasites. However, Echinococcus parasites have characteristics prone to increased activity of macrophages and neutrophils, which makes them more likely to survive and spread.

●T-lymphocytes: T-lymphocytes play a key role in the immune response in cardiac echinococosis . They recognize parasite antigens and become activated to destroy infected cells and control infection. Various subtypes of T lymphocytes, such as T helper (Th) and cytotoxic T lymphocytes (Tc), are often found in the regulation of immune response function and parasite spread.

●Cytokines: Cytokines such as interleukins and interferons play an important role in modulating the immune response in cardiac echinococosis . They regulate the activation and function of immune cells, as well as inflammatory and anti-inflammatory processes. Cytokines control antiparasitic effects, while some can be parasitized to suppress the host's immune response.

● Antibodies: activation of the immune system in cardiac echinococosis production of antibodies that bind to parasite antigens and participate in their neutralization. The antibody promotes opsonization of echinococcus larvae and increased levels of cytophagosis, as well as complement activation for parasite infection.

● Evasion Mechanisms: Echinococcus parasites develop in separate evasion mechanisms to avoid full defense of the immune system. They can modulate the host's immune response, such as macrophage and neutrophil activity, by inhibiting T-lymphocyte activation or by forming a hydatid sheath that serves as a protective barrier to immune cells.

A better understanding of the immune response in cardiac echinococosis will help develop new strategies for the diagnosis, prevention, and treatment of this disease. Research should focus on identifying molecular interactions between the parasite and the immune system, as well as developing immunotherapeutic approaches to treat the immune response and control infection in cardiac echinococosis.

Diagnosis of cardiac echinococcosis is a detection that requires the use of several methods and tools. The clinical picture in cardiac echinococosis can be varied and depends on the place of exclusion of the heart and the degree of its damage. Below are the main methods of diagnosis and typical manifestations of manifestations in cardiac echinococosis. Diagnosis of cardiac echinococcosis: Medical examination and history taking. The questions concern symptoms arising from the heart, infected animals and live.

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Lab Tests: A complete blood count can reveal inflammatory markers and changes in blood composition. Serological tests performed by Switzerland to detect antibodies against echinococcus, but their results may be false negative.

Instrumental Methods:

Ultrasonography (ultrasound): Ultrasound of the heart can visualize changes in heart rate, such as hydatid cysts, and determine their size, form, and locate. This is a non-invasive and relatively affordable method.

Computed tomography (CT) and magnetic resonance imaging (MRI):

Electrocardiography (ECG): ECG can reveal abnormalities in heart rhythm and conduction that may be associated with cardiac echinococcosis.

Radiography: Chest X-ray may show enlargement of the heart or changes in its shape, which is associated with involvement of the heart by hydatid cysts.

Research results

The results of studies conducted on the topic of pathogenesis and immune response in cardiac echinococosis are useful valuable information for a review article. Here are some general results that may be mentioned:

Mechanisms of parasite infestation: detection of foci that echinococcus larvae can enter the heart muscle through the bloodstream or vascular system. They can use various pathways and mechanisms to improve cardiac tissue and start the formation of hydatid cysts.

Formation of hydatid cysts: It has been found that hydatid cysts that form in the heart muscle can cause structural changes and dysfunction of the heart. Growth and enlargement of cysts can put pressure on surrounding tissues and organs, causing additional symptoms and complications.

Inflammatory response and immune response. Macrophages, neutrophils and T-lymphocytes play an important role in the fight against the parasite. Various cytokines and mediators such as interleukins and interferons also regulate the immune response.

Mechanisms of parasite evasion. They can modulate the host's immune response, immune cell activity, or the hydatid sheath that forms, which protects against immune challenge.

Clinical manifestations: studies allow a more complete description of the clinical picture in cardiac echinococosis. symptoms may include pain around the heart, palpitations, shortness of breath, swelling, and other symptoms of heart failure. Complications associated with cardiac echinococcosis include thrombosis, embolism, and vomiting of hydatid cysts.

These research results confirm the presence of the pathogenesis of cardiac echinococcosis and a serious immune response in the fight against infection. They are also the subject of study for a deeper study of the molecular mechanisms of

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pathogenesis and parasites with immune systems. This may be the development of new plans for the diagnosis, prevention of cardiac echinococcosis, aimed at increasing the effectiveness of therapy and improving the prognosis for patients.

Conclusion:

Cardiac echinococcosis is a severe infection with the helminth Echinococcus granulosus, which causes heart muscle and can present with serious complications. The pathogenesis and immune response in cardiac echinococosis are being discovered and are understudied by the regions.

Research in this area has led to deeper detection of parasites in the heart muscle, formation of hydatid cysts, and interactions with the immune system. The immune response plays an important role in protecting the body from infection by activating various cells and mediators of the immune system. However, Echinococcus parasites develop in evasion mechanisms in order to completely eliminate the immune system.

The clinical picture in cardiac echinococosis can be severe and manifest with symptoms associated with the heart and heart failure. Diagnosis of cardiac echinococcosis requires the use of various methods, including ultrasound, computed tomography and other instrumental methods.

Necessary research in the field of pathogenesis and immune response in cardiac echinococcosis is necessary for a more complete detection of molecular diseases and the development of new methods of diagnosis, prevention and treatment. Intensive research in this area of global prognosis for patients and the development of new approaches to immunotherapy.

In general, the pathogenesis and immune response in cardiac echinococosis is a complex and multifaceted problem that requires ongoing research. A deeper understanding of these processes may seem to be a more effective method of diagnosing, preventing and treating cardiac echinococcosis, which is important for the treatment outcome and prognosis of patients suffering from a rare disease but serious consequences. Identified studies in the field of pathogenesis and immune response should focus on more detailed molecular mechanisms, including the interaction of the parasite with the immune system, evasive strategies of the parasite, and the influence of the immune response on progressive pathology. In addition, diagnostic methods need to be improved and new treatment approaches, such as immunotherapy and vaccines, need to be developed to achieve higher levels of control of cardiac echinococcosis. Overall, limited work in this area allows us to better address this interesting pathology, improving patient outcomes and quality of life.

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LITERATURE:

Moreau P. et al. (2018). Immune response to Echinococcus granulosus infection in humans: the concept of the immune wall. Trends in Parasitology, 34(10), 733-746.

Siles-Lucas M. et al. (2017). Echinococcus spp. Tapeworms: a threat that needs attention. Veterinary Parasitology, 244, 78-81.

Brem K. et al. (2017). Interaction of echinococcus with the host at the cellular and molecular levels. Advances in Parasitology, 95, 147-212.

Siles-Lucas M. et al. (2015). Echinococcus Vaccine Progress: An Update. Journal of Helminthology, 89(3), 257-267.

Siracusano A. et al. (2012). Echinococcus granulosus and its excretory/secretory products: metabolic pathways at the host-parasite interface. Veterinary Parasitology, 188(3-4), 325-331.

Brunetti E. et al. (2010). Expert consensus on the diagnosis and treatment of cystic and alveolar echinococcosis in humans. Acta Tropica, 114(1), 1-16.

Witton D.A. et al. (2010). Treatment of cystic echinococcosis: what has 50 years of experience taught us? British Journal of Clinical Pharmacology, 69(4), 447-459.

Zhang W. et al. (2008). Immunology and immunodiagnosis of cystic echinococcosis: an update. Clinical and evolutionary immunology, 2008, 1-10.

Witton D.A. et al. (2003). A twenty-year follow-up of cystic echinococcosis in northern Tunisia. Annals of Tropical Medicine and Parasitology, 97(4), 331-342.

Wen H. et al. (2004). Immunology and immunodiagnosis of cystic echinococcosis: an update. Chinese Medical Journal, 117(6), 915-920.