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OVERVIEW ON CARDIAC ECHINOCOCCOSIS

KARDİYAK EKİNOKOKOZA GENEL BAKIŞ

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Abstract

Many varieties of microorganisms can lead to heart diseases. Parasitic diseases are among them. In endemic countries, Echinococcus granulosus can cause cardiac involvement. Even though it is rare, this disease can cause mortality. In this review, we aimed to overwiew cardiac echinococcosis in the light of literature.

Keywords: *cardiac echinococcosis, Echinococcus granulosus, hidatic disease.*

Özet

Birçok mikroorganizma çeşidi kalp hastalıklarına yol açabilir. Parazit hastalıkları da bunların arasındadır. Endemik ülkelerde Echinococcus granulosus kalp tutulumuna neden olabilir. Nadir de olsa bu hastalık ölüme neden olabilir. Bu derlemede kardiyak ekinokokkozu literatür ışığında gözden geçirmeyi amaçladık.

Anahtar Kelimeler: *kardiyak ekinokokkoz, Echinococcus granulosus, hidatik hastalık.*

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OVERVIEW / GENEL BAKIŞ

A diversity of parasitic microorganisms can cause direct or indirect damage to the heart. This involvement can present in a variety of ways, although the symptoms caused by myocardial and pericardium dysfunction are the most common. The pericard tissue is the most affected cardiac region, with subsequent pericardial effusion, pericarditis (acute or constrictive) and cardiac tamponade (1).

Human hydatidosis (HH) is a parasitic- zoonotic disease, caused by the parasite Echinococcus spp. mainly E. granulosus (belonged to family Taeniidae), and that is still prevalent in many regions of the world, particularly in Mediterranean countries, Australia, South America and especially in developing countries (2). HH is caused mostly by infection with E. granulosus larvae (3). Echinococci reach the heart via the coronary or pulmonary circulation, or from foramen ovale. About 1 to 5 years after the embryo reaches the heart, Echinococci reaches full maturity. Myocardium's reaction to a cyst an adventitial pericyst layer is formed as (3-6). It is predicted that one million individuals are affected worldwide, with a 2/100,000 incidence (4). HH mostly affects the liver (60–70% of cases) and the lungs (30 %) (5). But rarely HH may affect the cardiac tissue. Cardiac echinococcosis (CE) is a rare form of HH, which is mostly caused by E. granulosus (6). This study aimed to review the literature on intracardiac involvement of HH and to increase awareness on this topic.

Cardiac Echinococcosis

1. Epidemiology

Animals (e.g., sheep, dogs, cattle) play an important role in the animal-human transmission pathway. Communities with high incidence have low education and socioeconomic status (6,7). The adult tapeworm is most seen in dogs and other canines; the tapeworm eggs are excreted in the feces of the animal, and people become infected after swallowing the eggs (3,6). CE is shown to be endemic in livestock-raising nations. CE affects both genders equally and is more common among the young individuals (7).

The prevalence and incidence of HH show significant changes according to geographical regions. This rate varies between 1–500 and 100,000. Regions with high prevalence have been reported as Africa (North and East), the continent of Australia, Eurasia (Russian Federation, Mediterranean neighboring countries, and Turkish Republics), and South America (8). HH was included in the scope of notifiable

diseases in 2005 by the Ministry of Health in Turkey. However, a regular flow of information cannot be provided in the notifications, so there is a problem in estimating the exact incidence for Turkey (9).

2. Human hydatidosis localizations

Although HH has the potential to involve all tissues, the disease mostly affects the liver (60–70% of cases) and the lungs (30 %) (5,10). Thoracal HH is rare and pleural, mediastinal, diaphragmatic, and heart involvements may occur, and even HH can be seen in the chest wall. It has been reported that the frequency of intrathoracic extrapulmonary involvement in all HH cases is around 7.4% (11). CE is very rare disease due to myocardial contractions. It was reported that only 0.5-2% of all HH cases have a cardiac involvement (6).

The left ventricular wall is the most common EC localization in the heart. The left ventricle is the most commonly affected location in all cases of CE (55–60% of cases), then comes the right ventricle (10%), pericardium (7%), pulmonary artery (6%), and left atrial appendage (6%), and involvement of the interventricular septum is believed to be rare (4 % of cases). More rarely, right ventricle and interventricular septum localization are detected. Pericardial hydatid cysts are extremely rare (12-15).

3. Clinical presentations

The main symptoms are chest discomfort, dyspnea, palpitations, and cough (7). Cough, fever, hemoptysis, syncope, arrhythmias, conduction disturbances, myocard infarction, cardiac valvular dysfunction, acute pericarditis, pulmonary hypertension, pulmonary/systemic embolism may occur (3,6).

Sometimes intracardiac rupture of the cyst may develop and in this case, the agent may migrate to the systemic circulation or neighboring organs (1). The patients have many different clinical signs and symptoms due to the location of the cyst and the degree of pressure on the affected organs. Although most patients are asymptomatic, symptoms due to compression on surrounding tissues may be seen in some cases. Occasionally, symptoms may result from perforation of antigenic material and secondary immunological reactions from cyst rupture (3,7). After the cysts reach a large size, angina pectoris, palpitations, valve dysfunction, arrhythmias, gives clinical findings such as pericardial reaction, pulmonary and systemic embolism, and pulmonary hypertension may ocur (16). Similarly, pericardial EC remain asymptomatic until the cyst ruptures (12,13).

4. Diagnosis- Differential diagnosis

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The diagnosis may be missed because patients may present with very different clinical manifestations. Detailed anamnesis, serological and radiological examinations can be used in the diagnosis of this disease (3,6). To diagnose of this disease, echocardiography is the most widely used diagnostic method (7). In echocardiography, it seems surrounded by a thin membrane with many septa and sometimes with juvenile cysts. As such, it can be easily distinguished from other cardiac masses. In some cases, the lesions are solid masses. It may have an appearance and a multilocular character (12). In addition, computed tomography and magnetic resonance imaging can be used for diagnosis in imaging (6). The imaging findings in other organs are similar to those in the liver; however, there is no case of alveolar echinococcosis involving the heart. CE is more usually detected in the liver or lung, with a well-defined cystic or multicystic mass containing liquid or septa and some with calcification of the cyst wall, matrix, or both (17). According to the literature, CE cysts are characterized by numerous, thin walls and a proclivity to enter the heart or pericardium (14). There are no gold-standard predictive routine blood tests for CE; however, serology can be used as a first-line diagnostic and is critical in the proper diagnosis of CE (20).

Although electrocardiographic findings are not characteristic of CE, repolarization changes, complex premature ventricular contractions, atrioventricular or intraventricular blocks, can be detected (21-24). Abnormal heart shadow on chest roentgenogram pulmonary cyst or left ventricular free wall. Calcified lobular masses can be seen in localized cysts (17,19,20).

In summary, the characteristic radiological findings associated with positive serology for echinococcosis help us to diagnose CE (3,6,7,12). Although some CE patients do not have a detectable immune response, antibody testing can help confirm the presumed radiologic diagnosis (20).

5. Treatment

Orally mebendazole or albendazole treatments are effective against HH. However, the primary treatment method for patients with CE is surgery, and surgery should be applied together with medical treatment (3,6). Even in asymptomatic individuals, surgical therapy is preferred for CE since rupture of the cyst might result in anaphylaxis or metastatic disease to the other organs (18). Untreated infection has a high risk of sudden rupture, resulting in anaphylactic shock, acute dissection of the free wall of the ventricle and even sudden death (21-24).

Furthermore, in the first five postoperative years, these patients should be monitored for recurrence cysts utilizing serologic and ultrasonography testing (19).

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SUMMARY / SONUÇ

Although CE is one of the rare causes of heart disease outside of endemic areas, parasitic cardiac involvement should be considered in the differential diagnosis of myocardial and/or pericardial diseases of unknown etiology, especially in both immunocompromised and immunocompromised patients. To confirm the diagnosis, radiological and serological examinations should be evaluated together.

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