ROLE OF EPIDEMIOLOGIC DATA IN MANAGEMENT OF HYDATIDOSIS IN CONSTANTA COUNTY, ROMANIA

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Abstract. Introduction: Constanta county is a Romanian region characterized by a high endemicity (6 cases/100.000 inhabitants) of hydatidosis. This represents a public health problem due to medical and social implications. Specific traditional way of life in Constanta: high number of domestic animals (sheep, cows, goats) are complicated by new epidemiological issues, such as high number of stray dogs, lack of anthelmintics prophylaxis and recommended vaccination in well- cared and stray dogs, specifically presence of dogs on the beach, contaminating the sand. In this article we describe the epidemiological data obtained during a more complex study. The results of the study were presented at the 17th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID) and 25th International Congress of Chemotherapy (ICC) in April 2007. Objectives. Evaluation of the interdependence between the links of the epidemic process (source of infection, route of transmission and vulnerable population) and various environmental factors that directly or indirectly contribute to the complex epidemiology of this disease. Material and method. We perform a prospective study on 320 patients diagnosed with hydatid cysts between 2001 -2006 from different places in Constanta county. Studied patients were ask to respond to a questionnaire regarding epidemiological aspects of hydatidosis. Results. The patients’ distribution per sex showed a higher incidence of this disease in women, compared to men; however, there is no significant relationship between hydatidosis and the risk of emergence in women. It is noticed that the highest number of studied cases is the age group 50-59 years old, that was contaminated at the active age, around 40 years old. The case distribution based on the social environment highlighted: a high number of cases from the urban area (234 cases, 72%), especially in Constanta city (182 cases), compared to the rural area (88, 28%). The greatest number of patients belong to the Romanian ethnic group and they represent the majority in our city and county. The second group are the Macedo-Romanians who represent a significant group in Constanta county and are well-known animal breeders, especially sheep. The epidemiologic inquiry was positive in most of the cases, the most of the patients admitted the contact with domestic animals (sheep, cattle, goats and dogs). Out of the 320 patients, 71 had already diagnosed with hydatid cyst in the past. It is noticed that the number of cases diagnosed with hydatidosis in our clinic significantly increased in the last years. Conclusions. The numerous sources of infection (dogs) and intermediary hosts (herbivorous) living in Dobrogea area maintain the disease endemicity. Given the minimization of the direct transmission through the improvement of the individual hygiene, the indirect transmission route is preponderant through contamination of the environment and a collective faulty hygiene. Keywords: hydatidosis, epidemiologic data, stray dogs

Introduction

The hydatid disease, hydatidosis or hydatid cyst is today a helminthozoonosis of international importance due to the long-term evolution, natural and post-surgical complications as well as to the significant public health, economic and social implications it entails.[1]

The cystic form of the disease in humans is caused by Echinococcus granulosus, while Echinococcus multilocularis is involved in alveolar echinococcosis and E. vogeli or E. oligarthrus in polycystic echinococcosis.
The first has the highest prevalence in Romania.[1]

**Epidemiology**

There are two main types of *Echinococcus granulosus* epidemics: domestic and sylvatic. The intermediate hosts in the first situation are dogs and other domestic ungulates, and in the second one the wild carnivores and ungulates have this role. [2]

In different regions, different species play the role of definitive or intermediate hosts. In some endemic regions, the two describe types of epidemics overlap. The most frequent type of *E. granulosus* epidemics in humans worldwide is the domestic one, the species involved are dogs, sheep, and goats. [3]

For example, in Australia, due to specific wildlife, the definitive hosts are dingoes, the intermediate hosts are marsupials that pass the disease to dogs and sheep, the main source of infection for humans. [4]. In Africa and Eurasia, there is a more complex situation because of the overlapping domestic and sylvatic life cycles of the parasite. This poses more problems related to disease control in humans. (fig.1).[3, 4]

People become infected by ingesting the eggs of *E. granulosus* excreted by carnivores, which can contaminate the soil, water, and eatable plants or due to contact with feces with eggs or sick animals. [2, 5]

Global distribution of *E. granulosus* in humans

The adaptability of the parasite *E. granulosus* from different hosts produced a wide geographical spread of the disease. Thus, it is found on all continents and in all climatic zones. The disease is more common in African countries (Kenya, Uganda, Sudan, and Ethiopia), Asia (China) and South America (Uruguay, Peru, Chile, and Argentina), but also in Mediterranean countries such as Israel, Tunisia, Turkey, Italy, Spain, and Croatia. [6]

The highest prevalence was reported in north-western Kenya, Turkana province (220 cases/100000 inhabitants) and in Israel, in Yirka province, where, in a community of 8200 people, was reported one of the most high prevalences in the world, 1583 cases per 100,000 inhabitants. [6]

In South America, the highest prevalence was reported in Uruguay (over 100 cases/100,000 inhabitants), followed by Chile and Argentina with 80 and 40/100,000 inhabitants. [7]

The high prevalence was found in the Mediterranean region: 12/100,000 inhabitants in the region of Zadar, Croatia, 14/100,000 inhabitants in Corsica, 10/100,000 inhabitants in Sardinia and more than 6/100,000 inhabitants in parts of Turkey, Italy, Spain, and southern France. [8]

Data from Romania shows that Constanța is a county with high endemicity (6 cases/100,000 inhabitants), the same as Brăila (8.2/100,000 inhab.), Calărași, Ialomița, Sibiu, Cluj, Timiș, and Tulcea (6/100,000 inhab.) (fig.2).[10, 11, 12]

There are villages where the incidence of hydatidosis exceeds 10 cases/100,000 inhabitants and it seems that this incidence is underestimated because of lack of epidemic studies in the past few years. [1]

**Specific emergence conditions for Constanța:**

- High number of domestic animals (sheep, cows, goats)
- High number of stray dogs
- High number of accompanying dogs
- Presence of dogs on the beach, contaminating the sand
Presence of dogs on the beach (both stray dogs and accompanying dogs) and sand contamination leads to the spreading of the disease especially among children.

Studies performed on sand samples collected from the beach showed the presence of a great number of parasitic species, such as *E. granulosus*. [1]

**Objectives**

Evaluation of the interdependence between the links of the epidemic process (source of infection, route of transmission and vulnerable population) and various environmental factors that directly or indirectly contribute to the complex epidemiology of this disease.

**Material and method**

- Prospective study
- 320 patients with hydatid cysts in different anatomic locations/organs.
- Period = 5 years (2001-2006)
- Epidemiologic questionnaire: animal contact, species of animals, history of hydatidosis, anthelmintics treatment, ethiniticity, residence address.

**Results and discussions**

The epidemiological aspects presented here are obtained during a more complex study involving patients diagnosed with hydatidosis between 2001-2006 in Constanța county. The results of this study were presented in a poster at Parasitology section at the 17th ECCMID and 25th ICC held in Munchen in April 2007. [9]

It is noticed that the highest number of studied cases is the age group 50-59 years old, and the infestation took place at the active age, around 40 years old. (Average = 45.171875, Median = 47), (Fig.4)

In our study, only eight children have been registered (Table I)

The case distribution based on the social en-
environment highlighted a high number of cases from the urban area (234 cases, 72%), especially in Constanța city (182 cases), compared to the rural area (88, 28%). (Table II, Table III, Fig. 5).

This might be caused by: the great number of stray dogs in the city, low degree of accessibility for the patients coming from the rural area.

Thus, it is noticed the “urbanization” process of hydatidosis, as Gherman noticed since 1994, pointing to the increasing number of cases coming from the urban area. [2]

It is noticed a great number of cases coming from Constanța city, which can be explained through: increased access to diagnosis facilities, high number of inhabitants compared to the other cities and high number of stray dogs.

Looking at this map, it is noticed that the patients with hydatidosis come from different areas of Constanța county, especially from the villages located in the neighborhood of Constanța city, rich villages, with large households where the peasants have as main activity animal breeding.

The small number of cases from the north of the county can be caused by the patients’ low accessibility to medical care. In this region, there are very poor villages, with small households, often affected by floods, with limited access roads and almost inexistent diagnosis facilities.

The greatest number of patients belong to the Romanian ethnic group and they represent the majority in our city and county (Fig.6). Even if their main activity is not animal breeding, they own dogs with low rate of anthelmintics prophylaxis and treatment, both in the urban or rural area.
The second group are the Macedo-Romanians who represent a significant group in Constanta county and are well-known animal breeders, especially sheep. The third group is represented by the patients belonging to the Moslem community (Turks and Tatars), who are famous farmers of sheep in the rural area. The small number of Gypsies under treatment can be explained by the lack of medical culture in this community, negligence and promiscuity. It is very likely that the number of cases in this community is higher, but this cannot be evaluated as they don’t seek medical care.

Patients’ distribution based on the education level shows a higher incidence in the patients with mid-level education (high-school) (Table IV).

The next group as incidence are the patients with basic studies (primary and secondary school), most of them coming from the rural area, especially from the villages and communes located far from the city. However, the small number of cases with...
university studies shows awareness on this problem, knowledge about the disease, transmission routes and implications.

The epidemiologic history was positive in most of the cases (234 cases, 73.12 %), meaning that most of the patients acknowledged the contact with domestic animals (sheep, cattle, goats and dogs) (Table V).

Out of the 320 patients, 71 were diagnosed with hydatidosis before. In most of the cases, the initial therapeutic choice was the surgical one, but the patients did not take the anthelmintics treatment in post-surgical period: either because they didn’t have access to drug (surgical interventions before the anthelmintics drugs were available in our country), or because of the surgeons’ mistrust in this therapy’s capacity to prevent recurrences. [13]

Conclusions

The hydatidosis is a zoonosis whose transmission to human beings is possible through a complex epidemiologic process. The numerous sources of infection (dogs) and intermediary hosts (herbivorous) living in Dobrogea area maintain the disease endemicity in this region. Given the minimization of the direct transmission through the improvement of the individual hygiene, the indirect transmission route is dominant due to contamination of the environment and a public health measures. The disease prevalence in the urban area certifies an increased number of contacts with the animal sources in this type of human settlement, the “occupational” feature of the disease being significantly diminished.

Our data shows the necessity of changing the public health management regarding hydatidosis in Constanta county, especially improving sanitation with better veterinary measures. It is also important to rise le awareness level about echinococcosis in general population and medical personnel

References


