

Cystic echinococcosis in the human population of a western Romanian county, 2004–2010

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Abstract

This report aims to assess the epidemiological characteristics of cystic echinococcosis (CE) in the largest Romanian county (Timis County). Our study group included 182 patients diagnosed with this condition during 2004–2010. The yearly detection rate of new cases was 3.8 cases per 100 000 inhabitants. People over 40 years old accounted for 52.7% of cases. The incidence was higher in women and in rural inhabitants. No statistically significant decline in the number and incidence of CE cases was observed throughout the study period ($R^2 = 0.24$, $p 0.3$). Consequently, more efficient implementation of correct public health measures is required to fully prevent and eradicate CE in this region.

Keywords: Cystic echinococcosis, epidemiology, hydatid disease, parasitology, Romania

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Cystic echinococcosis (CE) is a widespread zoonosis produced by *Echinococcus granulosus*. Most of the human cases occur in the Mediterranean countries, sub-Saharan

Africa, South America, Eastern Europe, Asia, the western USA and Australia [1]. In recent years, CE has been a re-emergent disease in many European countries [2–4]. Humans acquire the infection by ingesting the egg of the parasite as a result of direct contact with dog tapeworm carriers or indirectly through contaminated food or water [5]. Socioeconomic and cultural determinants play a major role in the transmission of the infections in man because of unsafe habits such as close co-habitation between humans and uncontrolled dogs, lack of control regarding livestock slaughter and unsanitary living conditions [6]. The clinical picture and the course of the illness may vary with the parasitic strain, size of the hydatid cyst and its growth rate, parasitized organ, integrity of the cyst and secondary infections [7]. Generally, humans are asymptomatic in the first stage of the infection, and the course of the disease may evolve for some time without any clinical signs and symptoms [7].

In 1995, Romania was listed among the countries with the highest prevalence of CE worldwide [8]. Nevertheless, CE is not a notifiable disease in this country.

The aim of this report is to assess the characteristics of human CE in Timis County (situated in western Romania and with a population of 677 926 inhabitants) with the main focus on the disease epidemiology. In the beginning of the 1990s, Timis was the sixth highest endemic county (out of 41 counties) for CE in Romania [9].

We have retrospectively analysed the medical records of the patients diagnosed with this condition in Timis County (see Supplementary material, Figure S1 for geographical localization) during the period 2004–2010. The diagnosis of CE was based on imaging techniques (ultrasonography, radiology, computed tomography scan, magnetic resonance imaging) as the principal criterion, and additionally on serology (detection of anti-*Echinococcus granulosus* antibodies by ELISA). For hepatic cysts, abdominal ultrasonography was the standard diagnostic criterion according to the standard classification proposed by the World Health Organization—Informal Working Group on Echinococcosis (WHO-IWGE) [10].

Statistical analysis was performed using the software package SPSS version 17.0 for Windows (SPSS Inc, Chicago, IL, USA). A p -value <0.05 was regarded as statistically significant.

A total of 182 patients aged 4–81 years (40.4 ± 19.4 years old) were diagnosed with CE in the studied region. The yearly detection rate of new cases was 3.8 cases per 100 000 inhabitants. No statistically significant decline in the number and incidence of CE cases was observed throughout the study period ($R^2 = 0.24$, $p 0.3$) (see Supplementary material, Figure S2).

Most people in the study group were female (62.1%), and the incidence rate was also higher than in men (4.6 versus 3

cases per 100 000 inhabitants). Patients over 40 years old accounted for 52.7% of cases. The peak incidence was registered in women aged 50–54 years (8.9 cases per 100 000 inhabitants), and in men aged 55–59 years (9.6 cases per 100 000 inhabitants) (Table 1). No statistically significant difference was found between men and women with respect to age (42.9 ± 20.4 versus 38.8 ± 18.7 years old, p 0.1). The incidence rate was higher in rural areas compared with urban regions (5.2 versus 3.2 cases per 100 000 inhabitants).

The majority of the affected adults (≥ 18 years old) were either labourers (49.4%) or retired (33.1%). Other specified professional categories within the study group were intellectuals and office workers (5.2%) as well as unemployed persons (5.2%).

Liver involvement predominated within the study group (81.9%) (Table 2), and these patients were significantly older (41.5 ± 18.2 years old, range: 5–81, p 0.004) than those with a pulmonary cyst (23.9 ± 21.9 years old, range: 4–71). The higher ratio of lung : liver involvement in children (1 : 1.6) than in adults (1 : 11) may explain the age discrepancy according to cyst localization.

Most of the patients had no complications (91.2%). Nevertheless, bacterial superinfections (43.8%) and liver cyst rupture/compression (43.8%) were the main complications in the remaining people.

Patients required between 2 and 54 days of hospitalization (13.8 ± 9.4 days: 1–7 days, 30.8%; 8–14 days, 31.3%; 15–29 days, 30.8%; and >30 days, 7.1%). Almost all patients made a complete recovery (99.5%).

In Romania, CE remains a concern because of the poor implementation of the educational programmes and prophylactic campaigns. National data for the entire country have

shown that the incidence of the disease decreased from 5.6 cases per 100 000 inhabitants during the period of 1953–63 [8,11] to 2.6 cases per 100 000 inhabitants during 1987–91 [12]. A previous major epidemiological surveillance performed in Timis County during 1985–1997 showed a higher yearly average incidence (overall 6 cases per 100 000 inhabitants: 6.4 in men versus 6.2 in women, and 5.3 in urban versus 8.5 in rural inhabitants) [9] than was reported for the period of 2004–2010.

The mean age of our study group was similar to that reported by other studies from the former Yugoslavia (41.4 years for women and 35.5 years for men) [13] and Turkey (36.2 years [14,15] and 36.4 years [16], respectively). A predominance of women was also reported in an extensive national survey (1987–1996) including patients from 37 Romanian counties (63.5%) [8] and in other studies from Bulgaria (female versus male incidence: 7 versus 5.9 cases per 100 000 inhabitants during 1950–1962, and 3.4 versus 3.1 cases per 100 000 inhabitants during 1983–1995 [17]),

TABLE 2. Distribution of the study group according to the localization of the hydatid cyst

Localization of the hydatid cyst	Cases (%)		
	Total ^a	Female ^b	Male ^c
Liver	149 (81.9)	95 (85.1)	54 (78.3)
Liver and lungs	13 (7.1)	6 (5.3)	7 (10.1)
Lungs	12 (6.6)	8 (7.1)	4 (5.8)
Spleen	3 (1.6)	2 (1.8)	1 (1.4)
Femur	2 (1.1)	1 (0.9)	1 (1.4)
Peritoneum	2 (1.1)	1 (0.9)	1 (1.4)
Kidneys	1 (0.5)	–	1 (1.4)

^aPer cent of total cases.
^bPer cent of female cases.
^cPer cent of male cases.

TABLE 1. Age and gender distribution of the study group

Age group (years)	Cases (%)			Cases per 100 000 inhabitants/year		
	Total ^a	Female ^b	Male ^c	Total	Female	Male
0–14	22 (12.1)	14 (12.4)	8 (11.6)	2.8	3.7	2
15–19	10 (5.5)	6 (5.3)	4 (5.8)	2.8	3.4	2.2
20–24	11 (6)	6 (5.3)	5 (7.2)	2.5	2.7	2.3
25–29	13 (7.1)	12 (10.6)	1 (1.4)	3.4	6.3	0.5
30–34	17 (9.3)	12 (10.6)	5 (7.2)	4	5.5	2.4
35–39	13 (7.1)	7 (6.2)	6 (8.7)	4.9	5.2	4.6
40–44	10 (5.5)	7 (6.2)	3 (4.3)	3	4.1	1.9
45–49	15 (8.2)	11 (9.7)	4 (5.8)	4.1	5.8	2.3
50–54	21 (11.5)	15 (13.3)	6 (8.7)	6.5	8.9	3.8
55–59	18 (9.9)	8 (7.1)	10 (14.5)	8.2	6.9	9.6
60–64	14 (7.7)	5 (4.4)	9 (13)	6	3.9	8.7
65–69	7 (3.8)	3 (2.7)	4 (5.8)	3.5	2.5	4.7
70–74	7 (3.8)	4 (3.5)	3 (4.3)	3.8	3.7	4.1
Over 75	4 (2.2)	3 (2.7)	1 (1.4)	1.8	2.1	1.3
Total	182	113	69	3.8	4.6	3

^aPer cent of total cases.
^bPer cent of female cases.
^cPer cent of male cases.

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