



A retrospective analysis of human cystic echinococcosis in Sardinia (Italy), an endemic Mediterranean region, from 2001 to 2005

Margherita Conchedda^{a,*}, Antonello Antonelli^b, Aldo Caddori^c, Flavio Gabriele^a

^a Sezione di Parassitologia, Dipartimento di Scienze Applicate ai Biosistemi, Università degli Studi di Cagliari, Cittadella Universitaria di Monserrato, Strada Provinciale Monserrato-Sestu km 0.700, Monserrato (Cagliari), Italy

^b Assessorato alla Igiene e Sanità, Regione Autonoma della Sardegna, Cagliari, Italy

^c Presidio Ospedaliero SS. Trinità, Cagliari, Italy

ARTICLE INFO

Article history:

Received 27 October 2009

Received in revised form 8 June 2010

Accepted 15 June 2010

Available online 28 June 2010

Keywords:

Cystic echinococcosis

Humans

Epidemiology

Incidence rates

Sardinia

ABSTRACT

To assess the current impact of human CE in Sardinia (Italy) and to monitor the changes over time, a survey has been carried out for the period 2001–2005 using hospital inpatient discharge reports (HDR) as information source, supplementing data wherever possible with additional information retrieved directly from medical records. The total of 726 admissions with “Echinococcosis” as primary diagnosis (annual rate of 8.9 per 100,000 inhabitants) concerned 540 CE cases with an annual mean incidence rate of 6.62 per 100,000 inhabitants. Male-to-female ratio was 1.36, suggesting a marked risk associated with traditional male occupations. Age-specific incidence showed increasing rates of clinical CE with age for both genders. The liver was found to be the most common localization, affecting 72% of patients, while pulmonary CE was more frequent in males than in females. CE risk was unevenly distributed in the island. The more pastoral areas had the highest probability of humans becoming infected, with an incidence rate of clinical cases of ~14.0 per 100,000 for areas with sheep/inhabitants index of >6. Compared to the past, incidence rates appear to be decreasing both for pulmonary and hepatic localizations, while there is a reversal of the CE “urbanization” trend resulting in “ruralization”, accompanied by a greater degree of parasite ecological “isolation” and focus-points of infection risk. In spite of this decrease, the cost of hospital care alone (~4 million euros) suggests that the monetary plus non-monetary costs of CE are still very high but not fully recognised.

© 2010 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

Cystic Echinococcosis (CE) represents a major health problem in both epidemiological and clinical terms in many countries on all continents, persisting in many regions and re-emerging in others [1–13]. Despite its diffusion, the disease burden is generally underestimated [14] and only recently WHO included echinococcosis as part of a Neglected Zoonosis subgroup for its 2008–2015 control strategic plan [15].

Because of its life cycle, *Echinococcus granulosus* is widespread in pastoral communities where the long lasting “livestock-dog-human” interaction is thus more likely to exist. In Sardinia (Italy), an island of roughly 24,000 km² in the centre of the Mediterranean Basin with a population of around 1,600,000 inhabitants, the 8000 year-old tradition of sheep farming [16] is an important component of the agricultural economy because of the particular natural environment. More than 3 million sheep are in fact reared with extensive or semi

extensive methods, accounting for about 40% of the national total, with an average density of 130 sheep/km². Apart from climate and ecological conditions, structural, social and cultural factors affect CE transmission on the island: traditional sheep management, persistence of domestic or illegal slaughtering, large number of stray-“community-” and sheep-dogs and poor disease awareness.

Epidemiological surveys carried out over these past years have highlighted the endemic spread of the zoonosis in the island, notwithstanding the discontinuous efforts and investments expended on various accounts in the past in the strive to control CE [17]. In the 1940–50s the average annual incidence rate of human CE was about 15 per 100,000 inhabitants [18], while prevalence in sheep ranged from 70 to >90% [19]. Twenty years later the situation appeared to be unchanged [20]: human incidence of about 15 per 100,000 ranging from 12 to 22 per 100,000 in the different provinces, and prevalence in sheep of about 77–80% or more [21–23].

At the end of the 1960s a first control attempt was initiated that continued for a few years, with population health education and annual or six-monthly arecoline testing of owned dogs as benchmarks [17]. The control attempt was briefly resumed in the mid 1970s, soliciting owners to treat dogs with praziquantel. Subsequent surveys indicated a largely unchanged situation, with human incidence rate ranging from 13 per

* Corresponding author. Tel.: +39 0706754530; fax: +39 0706754536.

E-mail address: mconchedda@medicina.unica.it (M. Conchedda).

100,000 (1974–84) to 12 per 100,000 (1985–95) [24–30], and with a prevalence in sheep of 83–88% (1979–89) [25,31–36].

Finally in the late 1980s a comprehensive control attempt was launched, with the approval of an Action Plan for the eradication of Echinococcosis/Hydatidosis, experimentally carried out in two areas in central-north and south Sardinia. Unfortunately, with the move to regionalisation, financial and legislative constraints forced the plan to be revisited and eventually dropped [17].

Demographic and structural changes over the last decades have changed the scenario of CE diffusion that does not follow a univocal trend [17,25], highlighting the need for an update.

The latest surveys on animal epidemiology have shown persistent high regional prevalence in sheep: 76% in 1995–2000 [37–40] and 68–75% during the more recent 2004–2009 survey, ranging from 58 to 83% in the different provinces [41–45], with 10–28% of sheep harbouring fertile cysts.

Viceversa, data on human CE epidemiology in Sardinia in recent years are lacking, as monitoring diffusion with the previous methodology, collecting data directly from all public and private hospitals, was hindered by legislation concerning privacy rights.

The aim of this research was precisely to assess the present situation of CE in humans in Sardinia, also through a retrospective analysis, to gain better insight into the current epidemiological factors associated therewith. This has been achieved by examining hospital inpatient discharge records (HDR) over the five-year period 2001–2005 and comparing data with previous surveys.

2. Materials and methods

Introduced in Italy in 1991 as part of a broader plan for healthcare reform of the DRG-based reimbursement system, the HDR summarizes medical records and classifies diseases according to the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) by using standard diagnostic, treatment and procedures coding. As quality and thoroughness of collected information have improved over time, today they are judged by the National Department of Health to be quantitatively sound also for epidemiological purposes.

In the present survey all discharge reports from public and private Sardinian hospitals indicating “Echinococcosis” as primary diagnosis during the period 2001–2005 have been analysed, together with HDR regarding Sardinian patients admitted to hospitals on the Italian mainland, wherever possible supplementing data with other information gleaned from medical records used for other studies.

Hospitalization costs of human CE have been estimated on the basis of 2005 set inlier DRG reimbursement rates, overlooking additional costs of more onerous “outlier” cases.

Mean annual incidence rates for Sardinian residents have been calculated on the basis of 2001 Census population [46].

Organ-specific incidence rates have been calculated considering separately the various localizations in patients having more than one primary cyst in different organs.

Distribution over the island has been assessed by calculating incidence rates according to former and present administrative-territorial divisions (4 provinces until 2005, 8 currently) and for the roughly thirty historic sub-regions of the island. Furthermore rates have been calculated ranking villages according to the No. of sheep/No. of inhabitants (S/I) index [47].

3. Results

3.1. Admissions and costs

A total of 726 hospital admissions reported with “Echinococcosis” as primary diagnosis, was recorded during the period 2001–2005 for Sardinian residents (Table 1) giving an annual hospital admission rate

Table 1

Hospital Admissions indicating “Echinococcosis” as primary diagnosis in HDR during the period 2001–2005 in patients resident in Sardinia.

	N.	Annual Hospital admission rates $\times 10^5$ inhabitants		
		M	F	Tot.
Admissions in Sardinian hospitals ^a	693			
Admissions in hospitals in other Italian regions	33			
TOT	726	10.5	7.4	8.9
(mean/year)	145			

^a plus another 9 referring to non-residents in Sardinia making a total of 702 CE admissions to Sardinian hospitals and a total of 735 admissions examined.

of 8.9 per 100,000 inhabitants (10.5 per 100,000 for males and 7.4 for females respectively). In detail 693 (95.5%) referred to admissions in hospitals on the island and 33 (4.5%) in other Italian regions. In addition 9 admissions were registered in Sardinia, concerning non-residents, making a total of 735 admissions examined: 655 Ordinary Admissions (O.A.) and 80 Day Hospital (D.H.) stays.

Number of admissions per patient ranged from 1 to 13 but more than 73% of patients were only admitted once. Mean length of hospital stay was 14.7 ± 12.96 days for O.A. and 3.6 days for D.H., making a total of about 10,000 days of hospital stay, an average of about 2000/year.

Hospitalization costs of the disease, representing only a portion of just the health expenditure, is estimated to be about 4 million Euros, based on inlier DRG based reimbursement rates.

3.2. Clinical cases

Overall admissions concerned 540 Sardinian residents (on average 108/year) plus 7 non-residents, giving a mean annual incidence rate of CE cases of 6.62 per 100,000 Sardinian residents (Table 2). Note that apart from being residents, all but 22 patients were also born in Sardinia.

Overall 57.6% of patients were males and 42.4% females (male-to-female ratio = 1.36), with a mean annual incidence rate of 7.78 per 100,000 for males and 5.5 for females.

Analysis by age and gender showed increasing age-specific rates up to about 14.7 per 100,000 inhabitants in >70 year olds (Table 2).

About 64% of patients were assigned to at least one surgical DRG. Frequency of surgical patients, highest in the first age group (100%), appeared fairly stable with minor fluctuations up to 60–69 age group, then sharply decreasing in the elderly (40% or less in >70 year olds).

3.3. Localization

Overall analysis concerned 480 CE cases with single organ infection and 60 with multiple organ infections (Table 2). The majority of patients (71.9%) were affected by liver echinococcosis

Table 2

Human CE clinical cases in Sardinian residents in 2001–2005 by age group and gender. Annual mean incidence rates $\times 10^5$ inhabitants.

	Single organ infection			Multiple organ infection			Total Cases		
	M	F	TOT	M	F	TOT	M	F	TOT
age group									
0–9	0.28	0.29	0.28	0.28	0.00	0.14	0.55	0.29	0.43
10–19	2.11	1.34	1.74	0.00	0.22	0.11	2.11	1.56	1.84
20–29	2.70	2.65	2.59	0.64	0.33	0.49	3.34	2.98	3.08
30–39	4.85	3.15	4.00	0.15	0.30	0.23	5.00	3.45	4.22
40–49	7.63	3.86	5.73	1.19	0.00	0.59	8.82	3.86	6.32
50–59	11.08	7.54	9.19	0.40	0.39	0.39	11.48	7.92	9.58
60–69	12.99	10.91	12.01	2.50	1.34	1.88	15.49	12.24	13.89
≥70	15.95	9.62	12.32	3.46	1.66	2.40	19.40	11.28	14.72
TOT	6.83	4.97	5.88	0.95	0.53	0.74	7.78	5.50	6.62

Download English Version:

<https://daneshyari.com/en/article/3418027>

Download Persian Version:

<https://daneshyari.com/article/3418027>

[Daneshyari.com](https://daneshyari.com)