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ECHINOCOCCOSIS AND CYSTICERCOSIS IN POLAND IN 2012

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ABSTRACT

The aim of the study was to assess the epidemiological situation of echinococcosis and cysticercosis in 2012 as compared to previous years.

MATERIALS AND METHODS. The assessment of the epidemiological situation was based on data contained in the individual reports on cases sent to the Department of Epidemiology NIPH-NIH by the Regional Sanitary-Epidemiological Stations and on the pooled data published in the annual bulletin "Infectious diseases and poisonings in Poland."

RESULTS. In 2012, the total number of reported cases of echinococcosis in Poland was 28. This included: 11 undefined cases (39% of all cases), 7 alveolar echinococcosis cases (41% out of 17 cases in which the species of *Echinococcus* was recognized) and 10 cystic echinococcosis (59% of all defined cases). The total incidence of echinococcosis was 0.073/100 000. Cases were registered in 8 provinces. Most cases (9) and the highest incidence (0,620) was recorded in Warmińsko - Mazurskie. Echinococcus infections were reported in people aged 15 to 82 years, mostly adults (mean age 49.2 years, median 54.0). Echinococcosis was more frequent among women (incidence 0.096) than among men (incidence 0.048). The incidence of echinococcosis in rural areas was higher than in the city (0.125 vs. 0.039).

Cysticercosis, which occurs sporadically in Poland, was not reported in 2012.

CONCLUSIONS. For the purposes of epidemiological surveillance it would be advisable to introduce the obligatory differentiation of alveococcosis and hydatidosis, as well as a case definition for cysticercosis. In order to reduce the risk of contracting tapeworm infections, it is advisable to intensify educational efforts.

Keywords: *echinococcosis, Echinococcus granulosus, hydatidosis, Echinococcus multilocularis, alveococcosis, cysticercosis, Taenia solium, epidemiology, Poland, 2012*

INTRODUCTION

Information regarding the number of registered cases of echinococcosis and cysticercosis in Poland has been provided in routine epidemiological surveillance reports since 1997. Until that point, these diseases were reported together with cases of other tapeworm infections.

In Poland, cases of hydatidosis and alveolococcosis caused by the larval stage of *Echinococcus granulosus* and *E. multilocularis* were found. The aetiological agent of cysticercosis are *Taenia solium* larvae.

E. granulosus create unilocular cysts, located primarily in the liver, and rarely in other organs such as

the lungs or heart. As a result of mechanical damage to the cyst, the parasite oncospheres may spread to the peritoneal or pleural cavities.

E. multilocularis forms multilocular cysts, usually in the liver, and it can infiltrate into the surrounding tissues and metastasis to distant tissues and organs, often to the brain. The central nervous system is also a frequent location of *T. solium* cysts (neurocysticercosis).

Aim of the study. Assessment of the epidemiological situation of tissue cestodes: echinococcosis and cysticercosis in 2012 as compared to the situation in previous years.

MATERIAL AND METHODS

The assessment of the epidemiological situation of echinococcosis and cysticercosis was based on data from routine surveillance, published in the bulletin "Infectious diseases and poisonings in Poland in 2012" (Warsaw 2013, NIPH-NIH, GIS) and bulletins from previous years, as well as data from individual reports (epidemiological interviews) of cases of tapeworms infections at the larval stage, submitted to the Department of Epidemiology, NIPH-NIH by Sanitary-Epidemiological Stations. The data represents cases registered by the State Sanitary Inspectorate on the basis of reports made by physicians, who are required to report such cases. The case definition recommended by the EU has been used in the surveillance of echinococcosis since 2005. Currently, according to this definition, only cases of echinococcosis that meet at least one of the five criteria are recorded: a) the detection of *E. multilocularis* or *E. granulosus* in a histopathological or parasitological test, b) the detection of a cyst distinctive to *E. granulosus* in a surgical sample, c) the detection of typical changes in an imaging test and the confirmation of their aetiology in a serological test, d) the positive result of a high-sensitivity serological test confirmed with a high-specificity test, e) the detection of *E. multilocularis* or *E. granulosus* genetic material in a clinical specimen. In the surveillance of cysticercosis no case definition is applied - all cases of the illness reported by doctors should be recorded and disclosed in the reports.

RESULTS AND DISCUSSION

Cases of echinococcosis. Since 1997, when data on echinococcosis in Poland was first presented in epi-

demiological surveillance reports, the annual number of such cases ranged from 20 registered under routine surveillance (0.05/100 000) in 2004, and 65 for actively sought out cases (0.17/100 000) in 2006. No tendency of change in the level of the average annual incidence was observed (Fig. 1 Echinococcosis in Poland in the years 1997-2012. Incidence and incidence per 100 000 population). The situation in 2012 did not differ in comparison to previous years.

In 2012, in Poland a total of 28 cases of echinococcosis were recorded, and the incidence per 100 000 population was 0,073. The number of reported cases nearly doubled in relation to the previous year (19 cases), but it was one fifth lower than the median number of cases in 2006-2010.

Echinococcosis cases in 2012 were registered in eight provinces (in 2011 in nine). The highest number of cases and the highest incidence was observed in Warmińsko-Mazurskie, where one third of all recorded cases was found (9 cases) and the incidence (0.620) was more than 8 times higher than the incidence nationwide. Six cases were registered in Lubelskie (incidence 0.277) and Mazowieckie (0.113). Taking into account the differences in the number of residents, a higher incidence was reported in Podlaskie (0.167 and only two recorded cases) than in Mazowieckie (Table I. Echinococcosis in Poland in 2006-2012. Number of cases and incidence per 100 000 population by provinces).

The prevalence of echinococcosis observed in all of the provinces mentioned above is higher than the overall incidence in Poland. This is especially true for Podlaskie and Warmińsko-Mazurskie, which had more than an 8-fold and 3-fold higher average annual incidence, respectively, than the national incidence in 1998-2011.

Table I. Echinococcosis in Poland in 2006-2012. Number of cases and incidence per 100,000 population by province

Province	Median 2006-2012		2011		2012	
	Number of cases	Incidence	Number of cases	Incidence	Number of cases	Incidence
POLAND	36	0.094	19	0.049	28	0.073
1. Dolnośląskie	-	-	-	-	-	-
2. Kujawsko-pomorskie	2	0.097	-	-	2	0.095
3. Lubelskie	5	0.231	3	0.138	6	0.277
4. Lubuskie	-	-	1	0.098	-	-
5. Łódzkie	1	0.039	1	0.039	-	-
6. Małopolskie	-	-	-	-	-	-
7. Mazowieckie	3	0.058	3	0.057	6	0.113
8. Opolskie	-	-	-	-	-	-
9. Podkarpackie	1	0.048	-	-	1	0.047
10. Podlaskie	6	0.503	4	0.333	2	0.167
11. Pomorskie	-	-	2	0.088	1	0.044
12. Śląskie	-	-	1	0.022	-	-
13. Świętokrzyskie	-	-	-	-	-	-
14. Warmińsko-Mazurskie	8	0.561	3	0.206	9	0.620
15. Wielkopolskie	-	-	1	0.029	-	-
16. Zachodniopomorskie	-	-	-	-	1	0.058

Source: Infectious diseases and poisonings in Poland. NIPH-NIH, CSI. Warsaw. Annals 2006-2012

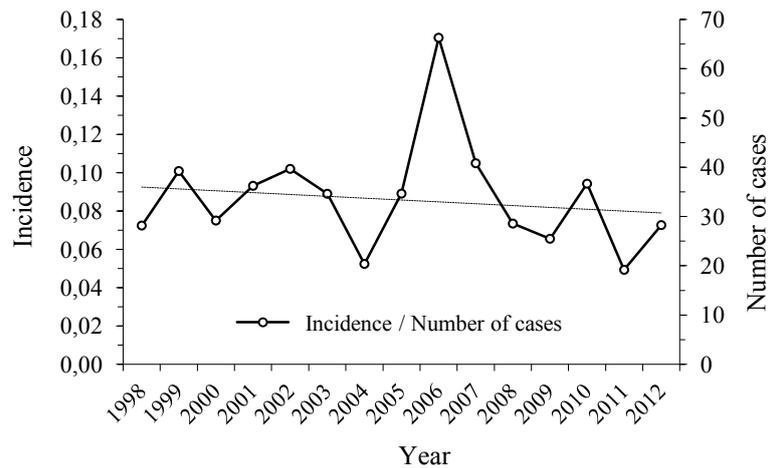


Fig. 1. Echinococcosis in Poland in 1998-2012. Number of cases and incidence per 100,000 population

In 2012, in the south and south-western provinces of Poland cases of echinococcosis were not reported. In light of long-term data, the incidence in these regions is much lower than in other parts of the country. It is important to note that in the Opolskie province no case of echinococcosis was reported since 1997.

In 2012, the incidence of echinococcosis in rural areas (0.125 per 100 000) was more than 3 times higher than in cities. Long-term data indicates that it is a consistent trend but usually the difference is not as large as it was in 2012. In the years 1997-2011, the average annual incidence in rural areas (0.125) was only 69% higher than in cities (0.039). (Table II Echinococcosis in Poland in the years 1997-2011. Number of cases, mean annual incidence rate per 100 000 population and percentage of cases by age, gender and location (urban/rural)).

According to the long-term trend, the incidence of echinococcosis in women (0.096 per 100 000) was much higher than the incidence in men (0.048) in 2012.

In this year, a two-fold difference in incidence rate was observed whereas in 1997-2011 the average annual incidence of echinococcosis for women (0.130) proved to be 2.5 times higher than for men (0.052). (Table II)

In 2012, the youngest person registered with echinococcosis was 15 years old, the oldest was 82. Adults aged over 29 years were most commonly infected (mean 49.2, median 54.0). Data from the years 1997-2011 show that the highest incidence of echinococcosis occurs especially among people aged over 49 years. (Table II)

Among the 28 cases registered in 2012, 7 (25%) were caused by *E. multilocularis*, 10 (36%) by *E. granulosus*, and in the remaining 11 cases (39%) the species of *Echinococcus* was not determined. The fraction of cases in which the species of *Echinococcus* has not been identified was comparably high, as in 2011, when it was determined in 37% of all cases. Yet, in comparison with the first registration year of echinococcosis this was a significant improvement. (Figure 2 Echinococcosis in

Table II. Echinococcosis in Poland in 1997-2011. Number of cases, mean annual incidence rate per 100,000 population, and percentage of cases by age, gender and location (urban/rural)

Age, years	Gender						Location						Total		
	Male			Female			Urban			Rural					
	Number of cases	Incidence	%												
00 - 04	2	0.013	1.5	5	0.035	1.4	3	0.018	1.2	4	0.031	1.6	7	0.024	1.4
05 - 09	9	0.057	6.7	9	0.060	2.5	9	0.054	3.7	9	0.065	3.5	18	0.057	3.6
10 - 14	13	0.069	9.7	11	0.061	3.0	14	0.068	5.8	10	0.062	3.9	24	0.064	4.8
15 - 19	8	0.037	6.0	10	0.048	2.8	7	0.028	2.9	11	0.064	4.3	18	0.041	3.6
20 - 24	2	0.009	1.5	16	0.074	4.4	8	0.029	3.3	10	0.060	3.9	18	0.039	3.6
25 - 29	7	0.033	5.2	19	0.093	5.3	12	0.046	5.0	14	0.090	5.5	26	0.060	5.3
30 - 39	11	0.030	8.2	31	0.086	8.6	18	0.040	7.5	24	0.086	9.4	42	0.055	8.5
40 - 49	24	0.060	17.9	57	0.142	15.8	39	0.076	16.2	42	0.147	16.5	81	0.098	16.4
50 - 59	21	0.064	15.7	80	0.225	22.2	57	0.125	23.7	44	0.194	17.3	101	0.140	20.4
60 - 69	24	0.119	17.9	68	0.266	18.8	43	0.147	17.8	49	0.294	19.3	92	0.191	18.6
70 +	13	0.078	9.7	55	0.182	15.2	31	0.112	12.9	37	0.191	14.6	68	0.137	13.7
Total	134	0.052	100.0	361	0.130	100.0	241	0.073	100.0	254	0.123	100.0	495	0.088	100.0

Source: Case-based reports sent to Epidemiology Department NIPH-NIH by sanitary-epidemiological stations

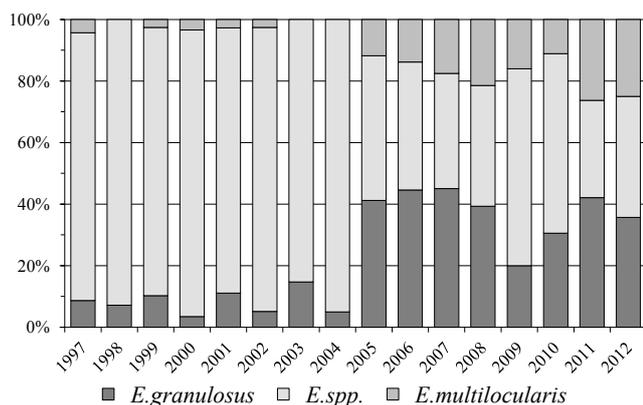


Fig. 2. Echinococcosis in Poland in 1997-2012. Percentage of cases by species of *Echinococcus*

Poland in the years 1997-2012. Percentage by species of tapeworm).

In the years 1997-2011, among cases of echinococcosis with identified species, cystic echinococcosis (73%) was diagnosed two times more frequently than alveolar echinococcosis (27%). In 2012, the rate of recognition of these two infections did not differ so much - hydatidosis and alveococcosis were found (respectively) in 59% and 41%.

Twenty-four people were hospitalized because of echinococcosis in 2012, which amounted to 82.8% of all cases registered by the Sanitary-Epidemiological Stations. According to data from the Central Statistical Office, one person died (a man from the age group of 75-79 years, residing in rural areas). The undetermined liver echinococcosis was indicated as the cause of death.

Cysticercosis. In 2012, there were no reported cases of cysticercosis; the disease occurred only sporadically in Poland. In the years 1997-2011 the surveillance system registered 13 such cases.

SUMMARY AND CONCLUSIONS

The epidemiological situation of echinococcosis in 2012 did not differ significantly from what was observed in previous years, and the increase in incidence that occurred this year, remained within the range of previously observed random annual fluctuations. Infections caused by *E. granulosus* are still more frequent than those caused by *E. multilocularis*. The lack of improvement in the fraction of cases in which the species of *Echinococcus* was determined is worrying. No cases of cysticercosis were registered.

Taking into account the needs of epidemiological surveillance and clinics, it would be advisable to introduce a standard tests differentiating *E. multilocularis* and *E. granulosus* and provide a case definition for cysticercosis, which was already suggested in last year's Epidemiological Chronicle (1).

In order to reduce the risk of contracting tapeworms, it is advisable to intensify educational efforts among the general population.

1. Czarkowski MP, Gołąb E. Invasive tapeworm infections in Poland in 2011. *Przegl Epidemiol* 2013; 67; 365-7.

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