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YERSINIOSIS IN POLAND IN 2013*

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ABSTRACT

AIM. The aim of this paper was to assess the epidemiological situation of yersiniosis in Poland in 2013 against previous years.

MATERIAL AND METHODS. We reviewed surveillance data published in the annual bulletin “Infectious diseases and poisonings in Poland” from 2008 to 2013 (MP Czarkowski et al., NIH and GIS) and individual yersiniosis case reports from 2013 sent by the Sanitary-Epidemiological Stations. Additionally, we use data from the Department of Demographic Surveys in Central Statistical Office.

RESULTS. A total of 219 yersiniosis cases were reported in Poland in 2013, including 199 cases of intestinal and 20 cases of extraintestinal yersiniosis. Among those were infections caused by *Y. enterocolitica*, and *Y. pseudotuberculosis* – 217 and 2 cases, respectively. The incidence rate was 0.57 per 100 000 inhabitants. Hospitalization required 54,8% of cases. Deaths related to the disease were not reported. Intestinal yersiniosis was manifested mostly by following symptoms: diarrhoea (91%), fever (74%), abdominal pain (49%) and vomiting (21%). The most affected group in intestinal infections were children younger than 4 years – 126 cases (63% of all cases). There were less extraintestinal infections in comparison to 2012 (30 cases), manifested mainly by symptoms from the osteoarticular system, presented in 80% of patients. Similarly to 2012, the most cases of intestinal yersiniosis reported from Mazowieckie province (123 cases). Serotypes of isolated *Y. enterocolitica* strains were identified in 115 cases (53%), including serotypes: O3 (88.7%), O8 (8.7%) and O9 (2.6%). One household outbreak caused by *Y. enterocolitica* O3 occurred. In 2013 identified 10 infections with serotype O8.

CONCLUSIONS. Occurrence of a significantly higher number of yersiniosis cases during the third and fourth quarter of 2013 suggests the changes in seasonal distribution of infections in comparison to previous years. This may be related to a very low number of infections caused by serotype O8, reported in past years within the first half of the year. Maintaining a high percentage (47%) of a non-serotyped strains of *Yersinia* isolated from patients points to lack of serotyping in routine laboratory diagnostics. Reporting cases of extraintestinal yersiniosis from only few provinces may suggest that the real number of infections remains underreported.

Key words: *yersiniosis, epidemiology, Poland, 2013*

In Poland, in 2013 totally reported 20 731 cases of intestinal bacterial infections (ICD-10: A02.0-A05.9) and the incidence rate was 53.5 per 100 thous. inhabitants. Despite the infections with *Yersinia* represent only 1-2% of all the total, from the epidemiological point of view remain the relevant etiological factor in gastrointestinal infections in Poland.

The aim of this paper was to assess the epidemiological situation of yersiniosis in Poland in 2013 against previous years.

MATERIAL AND METHODS

The evaluation was based on national surveillance data published in annual bulletin “Infectious diseases and poisonings in Poland” for the years 2008-2013 (MP Czarkowski et al., NIH and GIS), individual yersiniosis case reports from 2013, sent by the Sanitary-Epidemiological Stations, and data from the Department of Demographic Surveys in Central Statistical Office.

In Poland, in national surveillance system for intestinal yersiniosis we use a standard definition, adopted in

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the European Union (confirmed – probable case). Reporting of extraintestinal yersiniosis is based on national definition (definitions available on http://www.pzh.gov.pl/oldpage/epimeld/inne/Def_PL2_2a.pdf). Description of epidemiological situation of yersiniosis in Poland in 2013 includes: number of cases with incidence rate, distribution of cases in terms of: age, region, isolated serotypes of *Yersinia*, and clinical symptoms of disease.

RESULTS

In 2013 in Poland reported 219 cases of yersiniosis, the incidence rate was 0.57 per 100 000 inhabitants. Among those occurred infections caused by *Y. enterocolitica* and *Y. pseudotuberculosis* – 217 and 2 cases, respectively.

The number of reported cases was comparable with 2012 (231 cases; the incidence rate 0.6 per 100 thousand inhabitants) (*Tab.I*).

Criteria of intestinal yersiniosis definition met 199 cases (all confirmed), and for extraintestinal yersiniosis

20 cases, of those 6 classified as confirmed and 14 as probable (*Tab.II*).

The percentage of hospitalized cases (54.8%), was the lowest in comparison to past five years, however still represents over then a half of all reported infections (*Tab.I*). The highest was found among patients in age 10-19 years (89%) and over 60 years (80%). This situation may explain the fact that older children and adults are diagnosed in case of a severe condition, while hospitalization. In 2013 the percentage of hospitalization of children in age 0-4 years slightly decreased in comparison to previous year (2012 – 52%, 2013 – 50%).

The period of hospitalization due to yersiniosis ranged between 1 to 50 days, including: 1-4 days (34.2%), 5-7 days (27.5%), 8-14 days (22.5%), over 14 days (11.7%). The longest period was found for extraintestinal infection.

In 2013, according to data from the Department of Demographic Surveys in Central Statistical Office and individual case reports, there were no deaths related to *Y. enterocolitica* or *Y. pseudotuberculosis* infection.

Table I. Yersiniosis in Poland in 2008-2013. Median for: cases, incidence rate per 100 000 population and hospitalization in 2008-2010. Number of cases, incidence rate per 100 000 population, number and percentage of hospitalization in 2011-2013.

Years	No. of cases per quarter				No. of cases	Incidence rate	Hospitalization	
	I	II	III	IV			No. of cases	%
2008-2010	45	100	61	52	253	0.66	190	76
Median								
2011	56	77	57	67	257	0.67	190	74
2012	49	54	56	72	231	0.6	143	61.9
2013	33	47	62	77	219	0.57	120	54.8

Table II. Yersiniosis in Poland in years 2012-2013 by province. Number of cases and incidence rate per 100 000 population.

Province	All yersiniosis cases				Cases of intestinal yersiniosis				Cases of extraintestinal yersiniosis							
	2012		2013		2012		2013		2012				2013			
	No. of cases	Incidence rate	No. of cases	Incidence rate	Confirmed	Incidence rate	Confirmed	Incidence rate	Total	Incidence rate	Confirmed	Probable	Total	Incidence rate	Confirmed	Probable
1. Dolnośląskie	3	0.1	2	0.07	2	0.07	1	0.03	1	0.03	-	1	1	0.03	-	1
2. Kujawsko-pomorskie	14	0.67	9	0.43	14	0.67	9	0.43	-	-	-	-	-	-	-	-
3. Lubelskie	20	0.92	8	0.37	6	0.28	3	0.14	14	0.64	1	13	5	0.23	-	5
4. Lubuskie	3	0.29	1	0.1	3	0.29	1	0.1	-	-	-	-	-	-	-	-
5. Łódzkie	15	0.59	7	0.28	15	0.59	6	0.24	-	-	-	-	1	0.04	-	1
6. Małopolskie	16	0.48	12	0.36	15	0.45	12	0.36	1	0.03	1	-	-	-	-	-
7. Mazowieckie	103	1.95	123	2.32	102	1.93	122	2.3	1	0.02	-	1	1	0.02	1	-
8. Opolskie	2	0.2	9	0.89	-	-	6	0.6	2	0.2	-	2	3	0.3	-	3
9. Podkarpackie	8	0.38	6	0.28	7	0.33	3	0.14	1	0.05	-	1	3	0.14	1	2
10. Podlaskie	1	0.08	3	0.25	1	0.08	3	0.25	-	-	-	-	-	-	-	-
11. Pomorskie	5	0.22	8	0.35	5	0.22	8	0.35	-	-	-	-	-	-	-	-
12. Śląskie	20	0.43	16	0.35	19	0.41	14	0.3	1	0.02	-	1	2	0.04	2	-
13. Świętokrzyskie	-	-	3	0.24	-	-	1	0.08	-	-	-	-	2	0.16	1	1
14. Warmińsko-mazurskie	8	0.55	5	0.35	7	0.48	5	0.35	1	0.07	1	-	-	-	-	-
15. Wielkopolskie	8	0.23	4	0.12	2	0.06	3	0.09	6	0.17	-	6	1	0.03	-	1
16. Zachodniopomorskie	5	0.29	3	0.17	3	0.17	2	0.12	2	0.12	1	1	1	0.06	1	-
TOTAL	231	0.6	219	0.57	201	0.52	199	0.52	30	0.08	4	26	20	0.05	6	14

In 2013, cases of intestinal yersiniosis were reported from all provinces. The highest incidence rate was noted in Mazowieckie province (2.3 / 100 thous.) - more than four times higher than the incidence rate of yersiniosis in 2013 across the country. Number of cases reported in this single province (122 cases) accounted for 61% of all cases registered in Poland. This is a significant increase in comparison with the number of yersiniosis cases registered from this province within the past five years (the median for 2008-2012 – 48 cases). In Opolskie province, where last year did not identify any case, in 2013 reported six cases, and the incidence rate was 0.6/100 thous. In Kujawsko-pomorskie province, which was on the second place in terms of the highest number of infections, in 2013 identified only nine cases (the incidence rate 0.43/100 thous. vs. 0.67 / 100 thous. in 2012). In Dolnośląskie, Lubuskie and Świętokrzyskie reported in 2013 only one case of intestinal yersiniosis (*Tab II*).

Cases of extraintestinal yersiniosis were reported from 10 provinces. Most of the cases reported in the Lubelskie province – 5 (the incidence rate 0.23/100 thous.), however the incidence rate was almost three-fold decrease compared to 2012 (0.64/100 thous.). In remained provinces reported from one to three extraintestinal cases of yersiniosis (*Tab.II*).

Intestinal yersiniosis was mainly diagnosed among children younger than 4 (61.8%) and was comparable with 2012 (63.3%). Extraintestinal yersiniosis was reporting from patient in age 50-59 (7 cases), and 10-19 (4 cases). In remained age groups identified from one to three infections (*Tab. III*).

Significant differences in incidence rates for intestinal yersiniosis identified only among girls and boys in age 0-4 years. Boys were infected more often than

Table III. Yersiniosis in Poland in 2013. Number of cases by age and sex.

Age	Number of yersiniosis cases				Total
	Intestinal yersiniosis		Extraintestinal yersiniosis		
	Male	Female	Male	Female	
0	2	1	-	-	3
1	35	23	-	-	58
2	20	14	-	-	34
3	11	5	1	-	17
4	4	8	-	1	13
0-4	72	51	1	1	125
5-9	13	21	-	-	34
10-19	14	10	1	3	28
20-29	3	5	1	-	9
30-39	2	3	-	2	7
40-49	1	1	1	-	3
50-59	-	1	7	-	8
>60	1	1	2	1	5

girls, the incidence rate per 100 thous. was: 6.9 and 5.2, respectively. In case of extraintestinal yersiniosis, a significant difference in incidence rate according to sex was found only in age group 50-59, where the majority of cases were identified among men (*Tab. III*).

The most common symptoms of intestinal yersiniosis were diarrhoea - 181 cases (91%), or bloody diarrhoea (8.8% of patients) and a high fever (74%). Additionally, the illness was accompanied by abdominal pain and vomiting, which occurred in 49% and 21% of cases, respectively.

In extraintestinal yersiniosis predominated were symptoms from the osteoarticular system – 16 cases (80%). In addition, three cases developed post-operative

Table IV. The serotypes of *Yersinia* strains isolated from cases in Poland in 2013 by province.

Province	Intestinal yersiniosis				Extraintestinal yersiniosis			
	Serotypes				Serotypes			
	Y.enterocolitica			unknown	Y.enterocolitica			unknown
	O3	O8	O9		O3	O8	O9	
1. Dolnośląskie	-	-	-	1	-	-	-	1
2. Kujawsko-pomorskie	-	-	-	9	-	-	-	-
3. Lubelskie	3	-	-	-	-	-	-	5
4. Lubuskie	-	-	-	1	-	-	-	-
5. Łódzkie	1	-	-	5	-	-	-	1
6. Małopolskie	2	-	-	10	-	-	-	-
7. Mazowieckie	87	9	2	24	1	-	-	-
8. Opolskie	-	-	-	6	-	-	-	3
9. Podkarpackie	-	-	-	3	-	-	-	3
10. Podlaskie	1	-	-	2	-	-	-	-
11. Pomorskie	-	-	-	8	-	-	-	-
12. Śląskie	3	-	1	10	-	-	-	2
13. Świętokrzyskie	1	-	-	-	1	-	-	1
14. Warmińsko-mazurskie	2	-	-	3	-	-	-	-
15. Wielkopolskie	-	1	-	2	-	-	-	1
16. Zachodniopomorskie	-	-	-	2	-	-	-	1
TOTAL	100	10	3	86	2	0	0	18

wound infection, and the single cases erythema nodosum and sepsis.

Serotype of isolated pathogenic *Yersinia* was determined only in 52.5% of all cases, which is the same percentage as in 2013. The percentage of strains with undetermined serotype was differ in provinces. Majority of strains (more than 80%) were serotyped in Mazowieckie province. In remained provinces serotyping was performed only in single cases. In seven provinces although there were reported from one to ten cases, serotyping was not performed (Tab. IV).

In comparison to the year 2012, infections with serotype O3 were predominated (88.7% of all serotyped strains). Majority of them were identified in Mazowieckie province – 86.3%. Infections caused by serotype O8 accounted 8.7% (3 cases) of all strains with determined serotype – all were intestinal cases, which occurred in Mazowieckie province. In one case isolated serotype O9 (Tab. IV).

Among hospitalized cases, the largest proportion of cases were with unknown serological type of *Yersinia* (60%), following serotype O3 (34%). Five patients with serotype O8 and two with O9 also required hospitalization.

In 2013 majority of infections occurred in the third and fourth quarter of the year, with peak in October (Fig. 1). Seasonal distribution of infections in 2013 was different from these observed in the past years, when cases were occurring mainly within the first part of the year, or there were no differences in seasonality. This may be explained by a small number of reported infections with serotype O8 in 2013.

Infections caused by serotype O3 were prevailed among patients in age 5-9 years (68.8% of cases). Additionally, this serotype was isolated from children under 4 years of age (48.8%), of these over 34% required hospitalization, from patients in age of 10-19 (39.3%), and from a single cases in remained age groups. Single infections with serotype O8 occurred in all age groups, excluding group 40-49 years.

In 2013 one household outbreak caused by *Y. enterocolitica* O3 were reported in Mazowieckie province. Among cases were only children aged 0-14 years, no one

was hospitalized. Like in most small family outbreaks vehicle of the infection was not determined.

CONCLUSIONS

1. A total of 219 yersiniosis cases were reported in Poland in 2013, including 199 cases of intestinal and 20 cases of extraintestinal yersiniosis. Among those were infections caused by *Y. enterocolitica*, and *Y. pseudotuberculosis* – 217 and 2 cases, respectively.
2. Maintaining a small number of infections caused by serotype O8, which has been observed since two years, may suggest that the unknown source of infection is running out. However, this situation requires observation in the following years.
3. Occurrence of significantly higher number of infections within the third and fourth quarter of the year, points the changes in seasonality of yersiniosis, in comparison to previous years. This may be explained by a small number of infections with serotype O8 in 2013, reported in the past years within the first part of the year.
4. A high percentage (48%) isolates of *Yersinia* with unknown serogroup indicates that the strains serotyping is not performed as part of routine diagnostic procedure. According to this, it is relevant to decide from which financial sources it should be refunded.
5. Maintaining a low number of reported cases of extraintestinal yersiniosis only from a few provinces, may suggest substantial underreporting of this disease in Poland.

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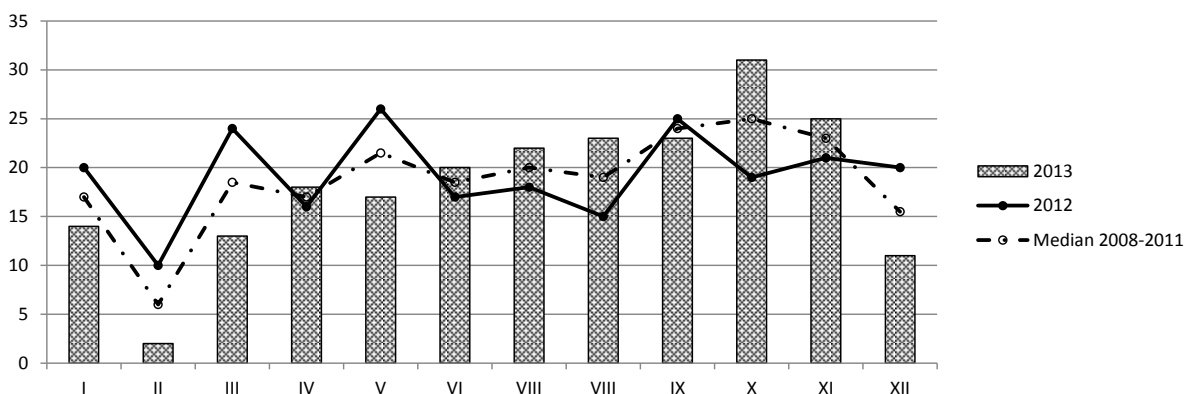


Fig. 1. Yersiniosis in Poland in 2008-2013. Seasonality of occurrence