

Sylvia Kamińska, Małgorzata Sadkowska-Todys

YERSINIOSIS IN POLAND IN 2012

Department of Epidemiology, National Institute of Public Health
– National Institute of Hygiene in Warsaw

ABSTRACT

AIM. The aim of this study is to assess the epidemiology of yersiniosis in Poland in 2012 compared to previous years.

MATERIAL AND METHODS. We reviewed surveillance data published in the annual bulletin “Infectious diseases and poisonings in Poland” from 2007 to 2012 (MP Czarkowski et al., NIH and GIS) and individual yersiniosis case reports from 2012 sent by the Sanitary-Epidemiological Stations. Additionally, we used data from the Department of Demographic Surveys in Central Statistical Office.

RESULTS. In Poland in 2012 a total of 231 yersiniosis cases were reported including 201 cases of intestinal and 30 cases of extraintestinal yersiniosis; 61.9% of patients were hospitalized. The incidence rate was 0.6 per 100 000 inhabitants. No deaths related to the disease were reported. Intestinal yersiniosis was manifested mostly by following symptoms: diarrhoea (87%), fever (76%), abdominal pain (47%) and vomiting (31%). The most affected group in intestinal infections were children younger than 4 years – 145 cases (72% of all cases). Extraintestinal form of infection was more common than in 2011 (19 cases) and usually involved symptoms from the osteoarticular system, noted in 90% of patients. Similarly to the previous year (2011) most cases of yersiniosis were reported from Mazowieckie province (103), no case has been reported from Świętokrzyskie province. Serological types of *Yersinia enterocolitica* were identified in 120 cases (52%): serotype O3 (96.7%), O8 (2.5%) and O9 (<1%). There were two household outbreaks. In comparison to previous years the total number of cases caused by serotype O8 has significantly decreased – from 55 cases in 2011 to 3 cases in 2012.

CONCLUSIONS. A large percentage (48%) of unknown *Yersinia* serotypes is a consequence, that **physicians do not** always **request** serotyping in routine 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, 2012

In Poland, in 2012 totally reported 10 054 cases of intestinal bacterial infections (ICD-10: A02.0-A05), the incidence rate was 26.1 per 100 thousand inhabitants. Despite the infections with *Yersinia* represent only 2% of all the total, remains a relevant etiological factor in gastrointestinal infections.

The aim of this paper is to assess the epidemiology of yersiniosis in Poland in 2012 against the 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 2007-2012 (MP Czarkowski et al., NIH and GIS), individual yersiniosis case reports from 2012, sent by the Sanitary-

Epidemiological Stations, and data from the Department of Demographic Surveys in Central Statistical Office.

In Poland, in epidemiological surveillance of intestinal yersiniosis, we use standard definition adopted in the European Union (confirmed – probable case). Additionally, extraintestinal yersiniosis is reported based on national definition (definitions are available on www.pzh.gov.pl). Description of epidemiological situation of yersiniosis in Poland in 2012 includes: the number and distribution of cases in terms of age, region, isolated serotypes of *Yersinia* and clinical symptoms of disease.

RESULTS

In Poland in 2012 a total of 231 cases of yersiniosis were reported, the incidence rate was 0.6 per 100 000

Table I. Yersiniosis in Poland in 2007-2012. Median for: cases, incidence rate per 100 000 population and hospitalization in 2007-2012. Number of cases, incidence rate per 100 000 population, number and percentage of hospitalization in 2010-2012

Years	No. of cases per quarter				No. of cases	Incidence rate	Hospitalization	
	I	II	III	IV			No. of cases	%
2007-2009	58	97	58	40	58	0.66	190	75.1
Median								
2010	47	75	54	57	233	0.61	177	76
2011	56	77	57	67	257	0.67	190	74
2012	44	45	49	63	231	0.6	143	61.9

inhabitants The number of cases was lower than in 2011 (257 cases; the incidence rate 0.67 per 100 thousand inhabitants) (Tab.I).

The percentage of hospitalized cases (61.9%), was lower than in previous five years but remains quite high (Tab.I). Hospitalization required all patients over 60 years, 96% patients in age 10-19, and 70% patients in age 20-59. This situation may explain the fact that older children and adults are diagnosed in case of severe condition. In 2012 the percentage of hospitalization of children in age 0-4 years significantly decreased in comparison to previous years (2011 – 76%, 2012 – 52%).

All reported cases of intestinal yersiniosis met criteria for case confirmation. Additionally 30 cases of extraintestinal yersiniosis, 26 were classified as probable cases, and 4 - as confirmed. For the comparison, in 2011 only 2 (10.5%) cases were classified as probable, and 17 classified as confirmed (89.5%) (Tab.II).

In 2012, according to data from the Department of Demographic Surveys in Central Statistical Office and individual case reports, there were no deaths related to *Yersinia enterocolitica* or *Yersinia pseudotuberculosis*.

In 2012, cases of intestinal yersiniosis were reported in 14 provinces. The highest incidence rate was noted in Mazowieckie province (1.63 / 100 thous.) - more than 3 times higher than the incidence rate of yersiniosis in 2012 across the country. Cases reported in this single province (103 cases) accounted for more than a half (51.2%) of all cases registered in Poland. This is a significant increase in comparison to the number of yersiniosis cases which have been registered from this province for the last five years (the median for 2008-2012 – 48 cases). The incidence rate reported in Kujawsko-pomorskie province (0.67 / 100 thous.) was two times lower than in 2011 (1.38/100 thous.). The highest decreased in the incidence of intestinal yersiniosis was observed in Zachodnio-pomorskie province. In two provinces, Opolskie and Światokrzyskie in 2012 no cases were reported (Tab II).

Cases of extraintestinal yersiniosis were reported from 10 provinces. Most of the cases (almost a half of all reported) occurred in the Lubelskie province – 14. In comparison to 2011 the number of cases of extraintestinal yersiniosis increased in Wielkopolskie province – 6 cases (Tab.II). In both regions the number of reported

extraintestinal cases was higher compared to the number of intestinal infections. This situation may indicate problems with recognition and/or possible underreporting. In remained provinces reported only sporadic cases of extraintestinal infection of *Yersinia*.

Intestinal yersiniosis was most commonly diagnosed among children younger than 4 (72%), and it was 5% increase in comparison to 2011. Extraintestinal yersiniosis occurred mostly in people aged 10-19 (6 persons), and over 40 years (total: 19 cases). Additionally, three cases occurred among children under 10 years. All cases were diagnosed with arthritis (Tab. III).

A significant differences in incidence of intestinal yersiniosis were observed among boys and girls in age 0 and 2 years of age. In age 0 boys were more likely to develop illness than girls, and the incidence rates were respectively: 15.7 and 8.35 per 10000. Among two year olds, girls were more likely to develop intestinal yersiniosis, with incidence rate 11.67/100 thous. (comp. among boys 5.54/100 thous.) No significant differences in incidence of extraintestinal yersiniosis between men and women in age groups were observed.

The most common symptoms of intestinal yersiniosis were diarrhoea - 187 cases (93%), in 10% of patients with blood, and a high fever (70%). In addition, the illness was accompanied by abdominal pain and vomiting, which occurred respectively in: 43.8% and 23.9% of cases.

In extraintestinal yersiniosis predominated were symptoms from the osteoarticular system (27 cases). In addition, a single cases developed post-operative wound infection, erythema nodosum and sepsis.

Serotype of isolated pathogenic *Yersinia* was determined in 52% of all cases, which represents a 12% increase compared to the previous year (39.7%). The percentage of strains with undetermined serotype was differ in provinces. Majority of strains (more than 90%) were serotyped in Mazowieckie province; it was a 30% increase compare to year 2011. Slightly above than a half of isolated strains were serotyped in Łódzkie province. Provinces where serotyping is not conducted despite reporting about 10 cases of yersiniosis every year are: Lubelskie, Kujawsko-pomorskie and Śląskie.

In comparison to the year 2011 proportions of occurrence particular serological group of *Yersinia*

Table II. Yersiniosis in Poland in years 2011-2012 by province. Number of cases and incidence rate per 100 000 population

Province	All yersiniosis cases						Cases of intestinal yersiniosis						Cases of extraintestinal yersiniosis					
	2011		2012		2011		2012		2011		2012		2011		2012			
	No. of cases	Incidence rate	No. of cases	Incidence rate	Con- firmed	Incidence rate	Con- firmed	Incidence rate	Total	Incidence rate	Con- firmed	Probable	Total	Incidence rate	Con- firmed	Probable		
1. Dolnośląskie	4	0.14	3	0.1	4	0.14	2	0.07	-	-	-	1	0.03	-	-	1		
2. Kujawsko-pomorskie	31	1.48	14	0.67	29	1.38	14	0.67	2	0.1	-	-	-	2	-	-		
3. Lubelskie	8	0.37	20	0.92	3	0.14	6	0.28	5	0.23	4	1	14	0.64	1	13		
4. Lubuskie	4	0.39	3	0.29	3	0.29	3	0.29	1	0.1	1	-	-	-	-	-		
5. Łódzkie	15	0.59	15	0.59	15	0.59	15	0.59	-	-	-	-	-	-	-	-		
6. Małopolskie	33	0.99	16	0.48	33	0.99	15	0.45	-	-	-	1	0.03	-	1	-		
7. Mazowieckie	91	1.73	103	1.95	89	1.69	102	1.93	2	0.04	2	-	1	0.02	-	1		
8. Opolskie	5	0.49	2	0.2	1	0.1	-	-	4	0.39	4	2	2	0.2	-	2		
9. Podkarpackie	6	0.28	8	0.38	4	0.19	7	0.33	2	0.09	1	1	1	0.05	-	1		
10. Podlaskie	1	0.08	1	0.08	1	0.08	1	0.08	-	-	-	-	-	-	-	-		
11. Pomorskie	10	0.44	5	0.22	10	0.44	5	0.22	-	-	-	-	-	-	-	-		
12. Śląskie	25	0.54	20	0.43	24	0.52	19	0.41	1	0.02	1	1	1	0.02	-	1		
13. Świętokrzyskie	2	0.16	-	-	2	0.16	-	-	-	-	-	-	-	-	-	-		
14. Warmińsko-mazurskie	3	0.21	8	0.55	3	0.21	7	0.48	-	-	-	1	0.07	-	1	-		
15. Wielkopolskie	4	0.12	8	0.23	3	0.09	2	0.06	1	0.03	1	6	0.17	-	-	6		
16. Zachodniopomorskie	15	0.87	5	0.29	14	0.81	3	0.17	1	0.06	1	2	0.12	1	1	1		
TOTAL	257	0.67	231	0.6	238	0.62	201	0.52	19	0.05	17	2	30	0.08	4	26		

Table III. Yersiniosis in Poland in 2012. Number of cases by age and sex.

Age	Number of yersiniosis cases				Total
	Intestinal yersiniosis		Extraintestinal yersiniosis		
	Male	Female	Male	Female	
0	18	9	-	-	27
1	40	38	-	-	78
2	6	14	1	-	21
3	7	6	-	-	13
4	2	5	-	-	7
0-4	73	72	1	-	146
5-9	11	8	1	1	21
10-19	13	7	4	2	26
20-29	5	3	-	-	8
30-39	-	1	1	1	3
40-49	1	1	3	4	9
50-59	2	2	3	3	10
>60	-	2	3	3	8

have changed. In 2012 infections with serotype O3 were predominated and accounted for 96.7% of all serotyped strains. Majority of them were identified in Mazowieckie province – 75.8%. Infections caused by serotype O8 accounted only 2.5% (3 cases) of all strains with determined serotype – all were intestinal cases, which occurred in Mazowieckie province (two cases) and Śląskie province (one case) in March, July and November. In one case isolated serotype O9 (Tab. IV).

Among hospitalized cases, the largest proportion of cases were with unknown serological type of *Yersinia* (62.2%) and serotype O3 (36.4%). Single patients with serotype O8 and O9 also required hospitalization.

In 2012 all infections were evenly distributed in the year time, with only a small increase in single months during the first half of the year and during the last quarter of the year (Fig. 1). Lack of differences in seasonal distribution during the year time was caused by a small number of reported infections with serotype O8 in 2012.

Among children under the age of 4 prevailed infections caused by serotype O3 (64.4% of cases), half of them required hospitalization. In addition, serotype O3 was isolated from patients in following age groups: 5-9 years (28.6% cases), 10-19 years (30.8% of the cases), and from single patients in other age groups. Infections caused by serotype O8 occurred among two children under 4 years, and in one patient over 60 years.

In 2012 two household outbreaks caused by *Yersinia* were reported in Poland. Both counted four persons. Among patients were only children aged 0-14 years, one were hospitalized. Outbreaks occurred in Mazowieckie province, and were caused by serotype O3. Like in most small family outbreaks vehicle of the infection was not determined.

Table IV. The serotypes of *Yersinia* strains isolated from cases in Poland in 2012 by province

Province	Intestinal yersiniosis				Extraintestinal yersiniosis			
	Serotypes				Serotypes			
	<i>Y. enterocolitica</i>			unknown	<i>Y. enterocolitica</i>			unknown
	O3	O8	O9		O3	O8	O9	
1. Dolnośląskie	1	-	-	1	-	-	-	1
2. Kujawsko-pomorskie	-	-	-	14	-	-	-	-
3. Lubelskie	1	-	-	5	-	-	-	14
4. Lubuskie	-	-	-	3	-	-	-	-
5. Łódzkie	8	-	-	7	-	-	-	-
6. Małopolskie	3	-	-	12	1	-	-	-
7. Mazowieckie	90	2	1	9	1	-	-	-
8. Opolskie	-	-	-	-	-	-	-	2
9. Podkarpackie	1	-	-	6	-	-	-	1
10. Podlaskie	1	-	-	-	-	-	-	-
11. Pomorskie	-	-	-	5	-	-	-	-
12. Śląskie	7	1	-	11	-	-	-	1
13. Świętokrzyskie	-	-	-	-	-	-	-	-
14. Warmińsko-mazurskie	1	-	-	6	-	-	-	1
15. Wielkopolskie	1	-	-	1	-	-	-	6
16. Zachodniopomorskie	-	-	-	3	-	-	-	2
TOTAL	114	3	1	83	2	0	0	28

CONCLUSIONS

1. In 2012, in Poland, reported 231 cases of yersiniosis - including 201 cases of intestinal yersiniosis and 30 cases of extraintestinal yersiniosis.
2. Occurrence the low number of cases caused by serotype O8, in comparison to an increasing trend of occurrence this serotype in Poland during the past years is currently difficult to interpret, and requires observation the epidemiological situation of infections with this serotype in the following years.
3. Lack of clear seasonality of occurrence of *Yersinia* infections in 2012 may be explain by low number of infections with serotype O8. In the previous years a clear seasonality of occurrence of yersiniosis in April-May was related with serotype O8.
4. A high percentage (48%) of *Yersinia* isolated from patients with unknown serogroup indicates that se-

rotyping of isolated strains is not performed as part of routine diagnostic procedure.

5. Maintenance the low number of reported cases of extraintestinal yersiniosis only from particular provinces, may suggest substantial underreporting of this disease in Poland.

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Corresponding author:

Dr Małgorzata Sadkowska-Todys
Zakład Epidemiologii
Narodowy Instytut Zdrowia Publicznego
- Państwowy Zakład Higieny
ul. Chocimska 24, 00-791 Warszawa
tel. 22 54-21-204

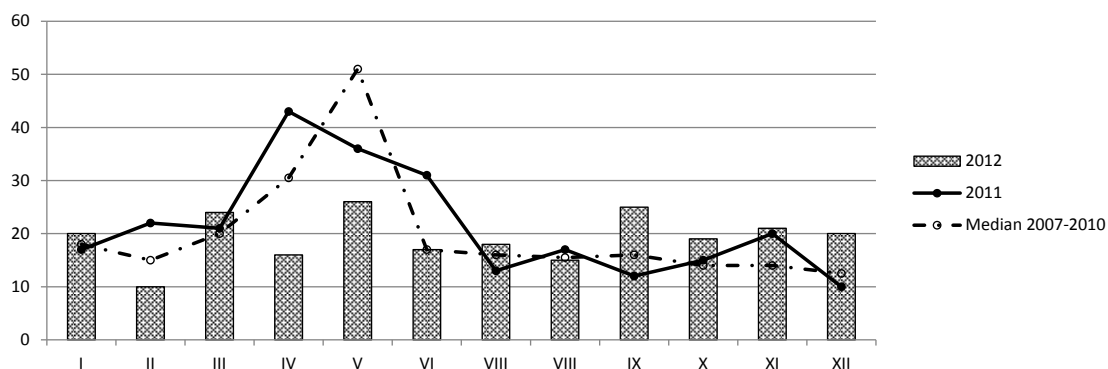


Fig.1. Yersiniosis in Poland in 2007-2012. Seasonality of occurrence