

Iwona Paradowska-Stankiewicz, Jolanta Rudowska

PERTUSSIS IN POLAND IN 2011

Department of Epidemiology National Institute of Public Health -NIH

ABSTRACT

INTRODUCTION. Results of the nationwide Pertussis Epidemiology Study implemented by Department of Epidemiology NIPH-NIH in 2009-2011 showed a high proportion of cases of whooping cough in adults whose only symptom of *Bordetella pertussis* infection was long lasting cough. It should be noted that the infected adults pose a risk of transmission of infection to susceptible contacts such as infants.

THE AIM OF THE STUDY. To assess the epidemiological situation of pertussis in Poland in 2011, including vaccine coverage of children.

MATERIALS AND METHODS. Assessment of the epidemiology of pertussis in Poland was based on analysis of individual reports of suspected cases of pertussis sent to the NIPH-NIH by the regional sanitary-epidemiological stations, data from the bulletin "Infectious diseases and poisonings in Poland in 2011" and bulletin "Immunizations in Poland in 2011" (MP Czarkowski et al, Warsaw 2012, NIPH-NIH, GIS).

RESULTS. In 2011, number of registered cases of whooping cough was 1 669. The incidence was 4.3 per 100,000 children up to 15. It was higher than in the previous year (3.3/100,000) by 25.5%. The highest incidence occurred in children aged 3 years (20.8/ 100 000), and in people in the age group 10-14 years (20.3/100,000). Number of hospitalized persons was 648, (38.8%) of reported cases. In 2011, there were no deaths from whooping cough.

SUMMARY AND CONCLUSIONS. Higher the incidence of pertussis observed in 2011, compared with the previous year, may indicate improved sensitivity of the surveillance system.

Key words: *pertussis, epidemiology, Poland, 2011*

INTRODUCTION

Results of the nationwide Pertussis Epidemiology Study implemented by Department of Epidemiology NIPH-NIH in 2009-2011 showed a high proportion of cases of whooping cough in adults, whose only symptom of *Bordetella pertussis* infection was long lasting cough. Infected adults can be a source of infection for susceptible individuals such as infants. Whooping cough is a disease which is subject to mandatory reporting and registration. Any suspicion of disease should be confirmed by laboratory testing, i.e. the assessment of specific antibodies to pertussis toxin IgA and IgG.

THE AIM OF THE STUDY

The aim of the study was to assess the epidemiological situation of pertussis in Poland in 2011, taking into account the state of vaccination against pertussis.

MATERIALS AND METHODS

Assessment of epidemiology of pertussis in Poland was carried out on the basis of an analysis of individual reports of possible and confirmed cases of pertussis which were sent to the NIPH-NIH by the regional sanitary-epidemiological stations and on the data from annual bulletins "Infectious diseases and poisonings in Poland in 2011" and "Preventive vaccinations in Poland in 2011" (MP Czarkowski et al, Warsaw 2012, NIPH-NIH, GIS – Chief Sanitary Inspectorate). Classification of pertussis cases were based on the case definition (Case definitions for infectious disease surveillance, 2011, Department of Epidemiology NIPH-NIH). According to the above definition clinical criteria meets a person with a cough lasting at least two weeks, with at least one of the symptoms: bouts of apnea after coughing or vomiting occurring immediately after coughing or any person with whom the doctor recognized pertussis or attacks of apnea in infants. Laboratory criteria include at least one of three criteria: the isolation of *Bordetella*

Table I. Pertussis in Poland in 2006-2011. Number of cases, incidence per 100,000 and distribution of cases according to age

Age in years	2006			2007			2008			2009			2010			2011		
	cases	inc.	%	cases	inc.	%	cases	inc.	%	cases	inc.	%	cases	inc.	%	cases	inc.	%
0	64	17.5	4.2	98	25.9	4.9	86	21.6	4.0	78	18.4	3.3	38	9.1	3.0	78	19.6	4.7
1	49	13.7	3.2	47	12.8	2.4	61	16.1	2.8	69	17.2	2.9	30	7.2	2.4	35	8.3	2.1
2	53	15.1	3.5	66	18.4	3.3	44	12.0	2.0	78	20.5	3.3	34	8.5	2.7	46	10.6	2.8
3	60	17.1	3.9	80	22.8	4.0	56	15.6	2.6	140	38.1	5.8	78	20.5	6.2	87	20.8	5.2
4	51	14.3	3.4	79	22.6	4.0	71	20.2	3.3	115	32.1	4.8	74	20.1	5.8	66	16.7	4.0
0-4	277	15.5	18.2	370	20.5	18.6	318	17.2	14.7	480	24.9	20.1	254	12.8	20.1	312	15.1	18.7
5-9	393	20.6	25.9	414	21.9	20.8	214	11.6	9.9	311	17.2	13.0	161	9.0	12.7	134	7.4	8.0
10-14	393	16.9	25.9	636	28.1	32.0	818	37.7	37.8	723	34.7	30.3	280	13.9	22.1	397	20.3	23.8
15 i >	457	1.4	30.1	567	1.8	28.5	813	2.5	37.6	876	2.7	36.6	571	1.8	45.1	826	2.5	49.5
Total	1520	4.0	100.0	1987	5.2	100.0	2163	5.7	100.0	2390	6.3	100.0	1 266	3.3	100.0	1 669	4.3	100.0

Source: Questionnaires of cases sent to NIPH-NIH by Voivodeship Sanitary and Epidemiological Stations

pertussis, or nucleic acid detection of *Bordetella pertussis* in a clinical specimen or a significant increase in the detection of specific antibodies against *Bordetella pertussis*. Epidemiological criteria are met when there is a transfer of infection from person to person. Based on the clinical, laboratory and epidemiological criteria, classification was established: possible case (person meeting the clinical criteria), probable case (person meeting the clinical and epidemiological criteria) confirmed case (person meeting the clinical criteria and laboratory confirmation).

RESULTS

In 2011, number of the recorded cases of whooping cough was 1669, i.e. 25.5% more than in the previous year but less than in 2007-2009. Incidence in 2011 in Poland was 4.3/100,000. It was higher than in the previous year (3.3/100,000) (Tab.I).

In 2011, as in previous years, wide variation between provinces was observed. Most cases, about 40% of all recorded cases occurred in the Mazowieckie and Śląskie (respectively 426 and 264 cases). The lowest number of cases was reported in Lubuskie and Warmińsko-Mazurskie 7 and 10 cases (Tab.II.). Such large differences in incidence between provinces may be due to low surveillance sensitivity in some of them. Low surveillance sensitivity was confirmed by the results of nationwide Pertussis Epidemiology Study.

Cases in the age group 10 - 14 years of age and above 15 years accounted for 73% of the all cases. The percentage of cases in those groups was respectively 24% and 49%. The age adjusted incidence was 20.3/100,000 and 2.5/100,000. In 2011, half of the cases occurred in persons over 15 years of age, while one in three affected including children in the age groups 0-4 and 5-9. The incidence in these groups was 15.1/100,000 and 7.4/100,000 (Tab I).

The incidence among women in 2011, as in previous years, was higher than among men (5.0 vs. 3.6/100,000). Higher incidence was recorded in urban areas (4.9/100,000), than in rural areas (3.5/100,000) (Table III).

In 2011, number of people who got ill in outbreaks was 317. Number of people who have been in contact with people coughing more than 14 days was 166. Moderate course of disease was defined 810 cases and in 25 severe. People hospitalized in 2011 with pertussis were 648.

In 2011, on 1 568 patients laboratory diagnosis of pertussis, Elisa tests and immunoassays, were done. Culture of *B. pertussis* was positive in 1 case. 100 patients were diagnosed on the basis of clinical signs only. In 2011 there were no deaths from pertussis.

Table II. Pertussis in Poland in 2011. Number of cases and incidence per 100,000 population, according to province

Provinces	2010		2011	
	Number of cases	Incidence	Number of cases	Incidence
Poland	1266	3.32	1669	4.33
1. Dolnośląskie	46	1.60	72	2.47
2. Kujawsko-Pomorskie	43	2.08	145	6.91
3. Lubelskie	3	0.14	26	1.20
4. Lubuskie	3	0.30	7	0.68
5. Łódzkie	387	15.25	218	8.59
6. Małopolskie	45	1.36	93	2.78
7. Mazowieckie	156	2.98	426	8.08
8. Opolskie	8	0.78	24	2.36
9. Podkarpackie	28	1.33	41	1.93
10. Podlaskie	271	22.79	139	11.56
11. Pomorskie	51	2.28	64	2.81
12. Śląskie	120	2.59	264	5.70
13. Świętokrzyskie	37	2.92	36	2.81
14. Warmińsko-Mazurskie	4	0.28	10	0.69
15. Wielkopolskie	52	1.52	59	1.71
16. Zachodniopomorskie	12	0.71	45	2.61

Source: Questionnaires of cases sent to NIPH-NIH by Voivodeship Sanitary and Epidemiological Stations

Table III. Pertussis in Poland in 2011. Number of cases, incidence per 100,000 and distribution of cases according to sex and age in urban and rural population

Age groups	Men			Women			City			Country			Total		
	cases	inc.	%	cases	inc.	%	cases	inc.	%	cases	inc.	%	cases	inc.	%
0	30	14,7	4,5	48	24,9	4,8	47	20,3	4,1	31	18,6	5,8	78	19,6	4,7
1	14	6,4	2,1	21	10,2	2,1	22	8,9	1,9	13	7,3	2,4	35	8,3	2,1
2	16	7,2	2,4	30	14,2	3,0	27	10,8	2,4	19	10,5	3,6	46	10,6	2,8
3	41	19,1	6,1	46	22,6	4,6	56	23,2	4,9	31	17,5	5,8	87	20,8	5,2
4	29	14,3	4,3	37	19,3	3,7	42	18,6	3,7	24	14,3	4,5	66	16,7	4,0
0-4	130	12,3	19,3	182	18,1	18,3	194	16,2	17,0	118	13,6	22,2	312	15,1	18,7
5-9	53	5,7	7,9	81	9,2	8,1	90	8,9	7,9	44	5,5	8,3	134	7,4	8,0
10-14	177	17,6	26,3	220	23,1	22,1	272	26,1	23,9	125	13,7	23,5	397	20,3	23,8
15-19	157	13,0	23,3	182	15,7	18,3	232	18,1	20,4	107	9,8	20,2	339	14,3	20,3
20 i >	157	1,1	23,3	330	2,1	33,2	350	1,9	30,8	137	1,2	25,8	487	1,6	29,2
Total	674	3,6	100,0	995	5,0	100,0	1138	4,9	100,0	531	3,5	100,0	1 669	4,3	100,0

Vaccination against pertussis in 2011. In 2011 vaccine coverage of children against pertussis was 98.1% - 99.7% across the country. In 2011 among 1669 reported cases of pertussis 252 people were not vaccinated, as they were born before the introduction of vaccination or received a permanent exemption from vaccination (15% of nonvaccinated). 261 patients did not know whether they were vaccinated. Among the remaining cases 907 patients received basic vaccination (4 doses), and 134 got primary vaccination + booster dose (5 doses), 73 subjects received primary vaccination: 3 doses of vaccine, and 42 people did not complete the course of primary vaccination.

At the present time, according to the Immunization Program, each child should receive a total of 5 doses of DTP vaccine at 2, 3-4, 5-6 and 16-18 months of age (basic vaccination with whole cell pertussis) and a booster dose of acellular one at the age of 6. Pertussis vaccine used in Poland is combined with the vaccine against diphtheria and tetanus (DTP). In the country is also available DTP vaccine combined with the vaccine against Hib, inactivated poliomyelitis vaccine and the vaccine against hepatitis B.

SUMMARY AND CONCLUSIONS

Higher incidence of pertussis, observed in 2011 as compared with the previous year, on one hand pointing to the circulation organism in the population and to the vulnerability to infection of the older age groups, on the other hand it may also indicate an improvement of sensitivity of the surveillance system.

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Address for correspondence:

Iwona Paradowska-Stankiewicz, MD
 Department of Epidemiology
 National Institute of Public Health
 -National Institute of Hygiene
 24 Chocimska Street, 00-791 Warsaw, Poland
 e-mail: istankiewicz@pzh.gov.pl