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PERTUSSIS IN POLAND IN 2012

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ABSTRACT

INTRODUCTION. The epidemiological situation of pertussis in recent years has changed dramatically. There is a high percentage of cases of pertussis among adolescents and adults. Infected adults can be a source of infection for non-immune individuals such as infants. The best strategy to prevent illness remains the implementation of vaccination in accordance with the applicable calendar.
THE AIM OF THE STUDY. To assess the epidemiological situation of pertussis in Poland in 2012 in comparison to previous years and evaluation of, 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 2012" and bulletin "Immunizations in Poland in 2012 "(MP Czarkowski et al, Warsaw 2013, NIPH-NIH, GIS).
RESULTS. In 2012, number of registered cases of whooping cough was 4 684. The incidence was 12.2 per 100 000 children which was three times as many as in the previous year (4,3) The majority of cases was among adolescents aged 10-14 years and above 15 years of age (77%). Number of hospitalized persons was 1503, (32%) of reported cases. In 2012, there were no deaths from whooping cough.
SUMMARY AND CONCLUSIONS. Observed in 2012, the epidemic increase in the incidence of pertussis in comparison with previous years, indicates the circulation of bacteria in the environment and the high sensitivity of the population to infection.

Key words*: pertussis, epidemiology, Poland, 2012*

INTRODUCTION

The epidemiological situation of pertussis in recent years has changed dramatically. There is a high percentage of cases of pertussis among adolescents and adults. Infected adults can be a source of infection for non-immune individuals such as infants. The best strategy to prevent illness remains the implementation of vaccination in accordance with the applicable calendar. Serological diagnosis of any suspected cases, including the designation of specific antibodies to pertussis toxin IgA and IgG should be a routine diagnostic procedure in both clinical and epidemiological surveillance for the purpose.

THE AIM OF THE STUDY

The aim of the study was to assess the epidemiological situation of pertussis in Poland in 2012, 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

Table I. Pertusis in Poland in 2007-2012. Number of cases, incidence per 100 000 and distribution of cases according to age

Age in years	2007			2008			2009			2010			2011			2012		
	cases	inc.	%	cases	inc.	%	cases	inc.	%	cases	inc.	%	cases	inc.	%	cases	inc.	%
0	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	164	42.7	3.5
1	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	92	22.7	2.0
2	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	118	27.8	2.5
3	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	173	39.9	3.7
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	165	39.4	3.5
0-4	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	712	34.5	15.2
5-9	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	358	19.4	7.6
10-14	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	1073	56.5	22.9
15 i >	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	2541	7.8	54.2
Total	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	4684	12.2	100.0

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

Sanitary-Epidemiological Stations and on the data from annual bulletins "Infectious diseases and poisonings in Poland in 2012" and "Preventive vaccinations in Poland in 2012" (MP Czarkowski et al, Warsaw 2013, 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 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 2012, number of the recorded cases of whooping cough was 4684, i.e. 181 % more than in the previous year and 96-136% more than in 2007-2009. Incidence in 2012 in Poland was 12.2/100 000 in comparison with the previous year (4.3). It was higher than in the previous year (3.3/100 000) (Tab. I).

In 2012, as in previous years, wide variation between provinces was observed. Most cases, about 40% of all recorded cases occurred in the Mazowieckie, Wielkopolskie and Łódzkie (respectively 805, 767 and 673 cases). The lowest number of cases was reported in Lubuskie: 23 cases. 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 (Tab. II).

Cases in the age group 10 - 14 years of age and above 15 years accounted for 77% of the all cases. The percentage of cases in those groups was respectively 22.9% and 54.2%. The age adjusted incidence was 56.5/100 000 and 7.8/100 000. In 2012, half of the cases occurred in persons over 15 years of age, while one in five affected including children in the age groups 0-4 and 5-9. The incidence in these groups was 34.5/100 000 and 19.4/100 000 (Tab I).

Table II. Pertussis in Poland in 2012. Number of cases and incidence per 100 000 population, according to province

Provinces	2011		2012	
	Number of cases	Incidence	Number of cases	Incidence
Poland	1669	4,33	4684	12,16
1. Dolnośląskie	72	2,47	221	7,58
2. Kujawsko-Pomorskie	145	6,91	260	12,39
3. Lubelskie	26	1,20	123	5,67
4. Lubuskie	7	0,68	23	2,25
5. Łódzkie	218	8,59	673	26,62
6. Małopolskie	93	2,78	419	12,51
7. Mazowieckie	426	8,08	805	15,21
8. Opolskie	24	2,36	58	5,73
9. Podkarpackie	41	1,93	134	6,29
10. Podlaskie	139	11,56	407	33,92
11. Pomorskie	64	2,81	163	7,13
12. Śląskie	264	5,70	395	8,55
13. Świętokrzyskie	36	2,81	92	7,21
14. Warmińsko-Mazurskie	10	0,69	81	5,58
15. Wielkopolskie	59	1,71	767	22,17
16. Zachodniopomorskie	45	2,61	63	3,66

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

Table III. Pertussis in Poland in 2012. Number of cases, incidence per 100 000 and distribution of cases according to sex and age in urban and rural population

Age	Men			Women			City			Country			Total		
groups	cases	inc.	%	cases	inc.	%	cases	inc.	%	cases	inc.	%	cases	inc.	%
0	61	30,8	3,1	103	55,3	3,8	88	39,6	2,9	76	46,9	4,6	164	42,7	3,5
1	41	19,7	2,1	51	25,9	1,9	51	21,6	1,7	41	24,2	2,5	92	22,7	2,0
2	59	27,1	3,0	59	28,6	2,2	74	30,0	2,4	44	24,7	2,7	118	27,8	2,5
3	79	35,6	4,0	94	44,5	3,5	93	37,2	3,1	80	43,8	4,8	173	39,9	3,7
4	76	35,5	3,8	89	43,6	3,3	110	45,8	3,6	55	30,9	3,3	165	39,4	3,5
0-4	316	29,8	16,0	396	39,4	14,6	416	34,8	13,8	296	34,0	17,8	712	34,5	15,2
5-9	180	19,0	9,1	178	19,8	6,6	211	20,5	7,0	147	18,1	8,9	358	19,4	7,6
10-14	472	48,4	23,9	601	64,9	22,2	673	66,5	22,3	400	45,1	24,1	1 073	56,5	22,9
15-19	521	45,0	26,4	624	56,3	23,0	752	62,0	24,9	393	37,3	23,7	1 145	50,5	24,4
20 i >	485	3,3	24,6	911	5,7	33,6	972	5,1	32,1	424	3,7	25,5	1 396	4,6	29,8
Total	1974	10,6	100,0	2 710	13,6	100,0	3024	12,9	100,0	1 660	10,9	100,0	4 684	12,2	100,0

The incidence among women in 2012, as in previous years, was higher than among men (13.6 vs. 10.6/100 000). Higher incidence was recorded in urban areas (12.9/100 000), than in rural areas (10.9/100 000) (Tab. III).

In 2012, number of people who got ill in outbreaks was 1063. Number of people who have been in contact with people coughing more than 14 days was 682. Moderate course of disease was defined in 2418 cases and in 79 severe. People hospitalized in 2012 with pertussis were 1503.

In 2012, on 4244 patients laboratory diagnosis of pertussis, Elisa tests and immunoassays, were done. Culture of *B. prtussis* was positive in 1 case. 439 patients were diagnosed on the basis of clinical signs only. In 2012 there were no deaths from pertussis.

Vaccination against pertussis in 2012. In 2012 vaccine coverage of children against pertussis was 97.9% - 99.6% across the country. In 2012 among 4 684 reported cases of pertussis 560 people were not vaccinated, as they were born before the introduction of vaccination or received a permanent exemption from vaccination (12% of non vaccinated). 813 patients did not know whether they were vaccinated. Among the remaining cases 2558 patients received basic vaccination (4 doses), and 496 got primary vaccination + booster dose (5 doses), 179 subjects received primary vaccination: 3 doses of vaccine, and 78 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 2012 as compared with the previous year, on one hand pointing to the circulation of bacteria 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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