

CLINICAL REVIEW

Pneumococcal vaccination – current situation and perspectives

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The authors carried out a survey in outpatient and hospitalised patients with risk factors for invasive pneumococcal disease in a tertiary-care medical faculty affiliated hospital. Data were collected by individual interviews and verified against the medical records of all addressed patients. The authors also attempted to discover the attitude of general practitioners (GPs) from 2 Slovak districts towards the pneumococcal vaccine by means of an anonymous questionnaire.

Out of the total of 154 addressed patients, 128 (83.1 %) had at least one risk factor for acquiring invasive pneumococcal disease. However, only 8 (6.3 %) of them had ever been administered pneumococcal vaccine. Out of 34 hospitalised patients with at least one risk factor 82.4 % had not received any pneumococcal vaccination in the past. When subdivided according to age and risk factors (chronic respiratory, cardiovascular, uropoetic, metabolic, immune system disorders, asplenia), vaccination coverage in all groups was very low, ranging between 0–9.3 %. In an anonymous questionnaire 74 (94.9 %) out of 77 surveyed GPs referred to a lack of information on the polysaccharide pneumococcal vaccine and 22 (28.2 %) expressed their general distrust towards vaccination of any kind.

The main role in increasing the disturbingly low pneumococcal vaccination coverage lies in the hands of medical professionals, especially GPs who should inform their patients about the possibility of a free vaccine and who should make an effort to explain to their patients the benefit of pneumococcal vaccination. (Tab. 4, Ref. 9.)

Key words: pneumococcal infection, vaccination, risk factors, attitude.

Pneumococcal infections are an important cause of community-acquired pneumonia as well as hospital admissions and death in both developed and developing countries. According to the WHO (World Health Organisation) estimate, pneumococcal diseases claim annually more than 1 600 000 human lives worldwide, making it the number one killer of all vaccine preventable diseases. In USA, pneumococci are annually responsible for 40 000 deaths – more than all other vaccine preventable diseases combined (1). Despite the rapid development of medical science and the level of knowledge, the case fatality rate for pneumococcal infections has remained steady for several decades. Streptococcus pneumoniae itself is responsible for 30–50 % of cases of community-acquired pneumonia in adults and also plays an important role in the nosocomial environment. Invasive pneumococcal diseases carry a high case fatality rate of 20–60 %, especially in elderly and chronically ill individuals (2). Despite rapid development of new antibiotics, the death rates due to pneumococcal invasive infection remain high. It is estimated that the

death toll attributable to pneumococcal infections in Slovakia is around 3,000 cases annually. Besides that, the continuing spread of antibiotic resistant strains of Streptococcus pneumoniae is associated with increased cost of patient treatment (3).

Many invasive pneumococcal infections could be prevented by early vaccination. Despite the fact that the current polysaccharide vaccine was registered as early as 1983, the vaccination

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Tab. 1. History of previous pneumococcal vaccination according to age.

Age	History of pneumococcal vaccination alone		History of pneumococcal and influenza vaccination		Total number of vaccinated against Streptococcus pneumoniae		No history of previous pneumococcal vaccination		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
<65 y	1	(0.8)	5	(4.1)	6	(4.9)	117	(95.1)	123	(100)
≥65 y	0	(0)	2	(6.5)	2	(6.5)	29	(93.5)	31	(100)
Total	1	(0.7)	7	(4.5)	8	(5.2)	146	(94.8)	154	(100)

coverage of the Slovak population remains unsatisfactorily low. In spite of the increased interest in pneumococcal vaccination in recent years, there is still little information on the extent to which the vaccine is actually used to protect individuals at the greatest risk(s) e.g. adults 65 years of age and older, and individuals above 2 years of age with chronic cardiovascular, respiratory, metabolic, uropoetic and immune system disorders, liver cirrhosis, and asplenia.

The authors performed a survey of both outpatients and hospitalised patients in a tertiary-care medical faculty affiliated health care institution, and they also attempted to discover the attitude of general practitioners (GPs) from 2 Slovak districts towards the pneumococcal vaccine through addressing them by means of an anonymous questionnaire.

Methods

The authors have focused their attention on individuals at the highest risk of developing invasive pneumococcal infection. The survey included 113 out-patient subjects before their examination at the Department of Clinical Immunology and Allergology and 41 in-patient subjects hospitalised at the Department of Tuberculosis and Pulmonary Diseases. Data were collected by individual interviews and verified against the medical records of all addressed patients in order to avoid subjective bias due to recollection problems. Interviews were carried out by either a consultant or medical students or a nurse on the basis of a standardised form. All in- and out-patient subjects available during a selected week in November 2003 were addressed. The response rate was 100 %. The main aim of the survey was to ascertain the number of risk factors (higher age, chronic respiratory, cardiovascular, metabolic, uropoetic and immune system diseases, liver cirrhosis and asplenia) in each interviewed individual and to search for the history of previous pneumococcal vaccination.

The general practitioners were given an anonymous yes/no questionnaire during postgraduate seminars organised in two neighbouring districts of North Slovakia. GPs were asked to express their opinions on reasons for the low pneumococcal vaccination coverage of the population at risk in Slovakia by answering yes/no to one or more of the following statements:

1) There is a lack of information about the polysaccharide pneumococcal vaccine.

2) Pneumococcal vaccination does not bring any benefit to vaccinated individuals.

3) I generally distrust vaccination of all kinds.

4) I am not interested in optional (not mandatory) vaccination.

5) Other reason (please list what).

Results

Out of the total of 154 interviewed patients, 128 (83.1 %) had at least one risk factor, 44 (28.6 %) had two and 26 (16.9 %) patients had three risk factors for acquiring invasive pneumococcal disease. Despite that, only 8 (6.3 %) of all interviewed subjects had ever been administered pneumococcal vaccine (Tab. 1). Out of the 34 hospitalised patients with at least one risk factor, 82.4 % had not received pneumococcal vaccination in the past.

Age group of 65 years and older

31 (20.1 %) patients were 65 years of age and older. 18 (58 %) of them were suffering from a chronic respiratory disease and 23 (74.2 %) from a chronic cardiovascular disease; the third most common risk factor was a chronic metabolic disorder found in 5 (16.1 %) of cases (Tab. 2). Only 2 (6.5%) patients of this age group have ever received pneumococcal vaccine, in both cases together with influenza vaccination (Tab. 1). In the patient groups suffering from chronic respiratory diseases and chronic cardiovascular diseases only 1 (5.6 %) and 2 (8.7 %) of them respectively, have ever received pneumococcal vaccine. None of the patients with chronic metabolic, uropoetic and immune system disorders was ever vaccinated against pneumococcal infection (Tab. 2).

Age group below 65 years of age

Out of 123 subjects below 65 years of age, 78 (63.4 %) had chronic respiratory disease and 43 (34.9 %) had chronic cardiovascular disease; the next two most common risk factors in this age group were immune system and uropoetic disorders with 29 (23.6 %) and 20 (16.2 %) cases respectively (Tab. 3). The history of previous pneumococcal vaccination was present in only 5 (6.4 %) vs 4 (9.3 %) vs 0 vs 1 (5.0 %) patients respectively (Tab. 3).

Tab. 2. History of previous pneumococcal vaccination in patients of 65 years of age and over according to risk factors (multiple risk factors).

Systems affected by chronic disease (risk factors)	History of pneumococcal vaccination alone		History of pneumococcal and influenza vaccination		Total number of vaccinated against Streptococcus pneumoniae		No history of previous pneumococcal vaccination		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Respiratory	0	(0)	1	(12.6)	1	(5.6)	17	(94.4)	18	(100)
Cardio-vascular	0	(0)	2	(8.7)	2	(8.7)	21	(91.3)	23	(100)
Uropoetic	0	(0)	0	(0)	0	(0)	2	(100)	2	(100)
Metabolic	0	(0)	0	(0)	0	(0)	5	(100)	5	(100)
Immune	0	(0)	0	(0)	0	(0)	1	(100)	1	(100)

Tab. 3. History of previous pneumococcal vaccination under 65 years of age according to risk factors (multiple risk factors).

Systems affected by chronic disease (risk factors)	History of pneumococcal vaccination alone		History of pneumococcal and influenza vaccination		Total number of vaccinated against Streptococcus pneumoniae		No history of previous pneumococcal vaccination		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Respiratory	0	(0)	5	(6.4)	5	(6.4)	73	(93.6)	78	(100)
Cardio-vascular	1	(2.3)	3	(7.0)	4	(9.3)	39	(90.7)	43	(100)
Uropoetic	0	(0)	1	(5.0)	1	(5.0)	19	(95.0)	20	(100)
Metabolic	0	(0)	0	(0)	0	(0)	7	(100)	7	(100)
Immune	0	(0)	0	(0)	0	(0)	29	(100)	29	(100)

None of the surveyed patients had either anatomical or functional disorder of the spleen. There were only 3 patients with liver cirrhosis among the patients surveyed and this relatively low number would therefore bias the final results.

In an anonymous questionnaire 74 (94.9 %) out of the 77 surveyed GPs stated that there was a lack of information on the polysaccharide pneumococcal vaccine and 22 (28.2 %) of them expressed general distrust towards vaccinations of any kind (Tab. 4).

Discussion

The polysaccharide pneumococcal vaccine currently registered in Slovakia has been proven to be safe and efficient in saving human lives of individuals with or without risk factors for invasive pneumococcal infection (4–9). The survey revealed that the pneumococcal vaccination coverage is very low not only in general population as a whole, but, which is even more embarrassing, also in individuals at the highest risk for developing invasive pneumococcal infection with possible life-threatening

complications e.g. bacteraemic pneumonia and/or meningitis. Individuals with the highest risk for developing serious complications due to pneumococcal infection are according to the regulations of the Ministry of Health of the Slovak Republic entitled to a free dose of polysaccharide pneumococcal vaccine. Despite that, the vast majority of them remain unvaccinated due to a lack of awareness of the registered vaccine. The main role in changing this unsatisfactory situation lies in the hands of general practitioners who should inform their patients about the possibility of a free dose and who should make an effort to explain to the patients the benefit of both pneumococcal and influenza vaccinations. It was therefore surprising that many GPs claimed that there is a lack of information about the vaccine, which has already been available in our country for many years. During recent years, the vaccine has been commented in many medical papers and discussed at a number of medical conferences and special postgraduate seminars. Every individual medical doctor is duty-bound to devote enough time to studying the available information about topical medical issues in order to perform his/her practice in the best possible way. Even more surprising was

Tab. 4. Responses of GPs to anonymous questionnaire survey.

Statement	Number of positive answers	
	n	%
There is a lack of information about polysaccharide pneumococcal vaccine	74	94.9
Pneumococcal vaccination does not bring any benefit to vaccinated individuals	0	0
I generally distrust vaccination of any kind	22	28.2
I am not interested in optional (not mandatory) vaccination	0	0
Other reason	2	2.6

the fact that so many of GPs confessed distrust towards vaccination of any kind. At the beginning of the 21st century marked by the rapid progress of vaccination science, this unbased opinion is hardly understandable and totally out of place. In the case of a death caused by *Streptococcus pneumoniae* infection in an unvaccinated individual who was not offered a free dose of pneumococcal vaccine, his/her GP should be questioned as to why the patient remained unprotected.

While the vaccination coverage of the paediatric population with obligatory vaccines in Slovakia ranks among the best in the world, the voluntary recommended vaccination of the groups at risk remains very low, even when provided free of charge. Increasing the vaccination coverage would have not only a big economical effect, but also, it would be of especial medical importance and would lead to a significant decrease of morbidity and mortality rates in vaccinated individuals, especially in groups of

elderly and chronically ill patients. It can be confidently assumed that the polysaccharide pneumococcal vaccine will become one of the most important vaccines available to protect mankind over the period of the next 20 years. The sooner medical professionals realise this fact and act upon it, the better it will be for their patients.

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