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General practitioners' experiences, attitudes, and opinions regarding the pneumococcal vaccination for adults: a qualitative study

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Nina Badertscher
Seraina Morell
Thomas Rosemann
Ryan Tandjung

Institute of General Practice and Health Services Research, University of Zurich, Zurich, Switzerland

Introduction: Diseases caused by *Streptococcus pneumoniae* generate substantial morbidity and mortality. Despite official recommendations to vaccinate everyone over the age of 64, the estimated vaccination rate for this target population is around 2%. In Switzerland, pneumococcal vaccinations are for the most part provided by general practitioners (GPs); in addition, a small number of patients get vaccinated during a hospital stay. We wanted to investigate GPs' attitudes and opinions about the pneumococcal vaccination in primary care and why it is so rarely provided.

Methods: For this qualitative study, we conducted semistructured interviews with 20 GPs. Transcriptions of all interviews were analyzed following the technique of qualitative content analysis, supported by the ATLAS.ti© software.

Results: Most GPs reported that they know pneumococcal vaccination is recommended for several risk groups and elderly patients. As to reasons for the low vaccination rate, GPs mentioned the pneumococcal vaccination had little priority in daily practice, especially in comparison with the importance of other vaccinations, namely influenza. This low level of priority was supported by the fact that the GPs rarely ever experienced a case of a severe pneumococcal disease in their daily work. Furthermore, perceived insufficient evidence resulting from existing epidemiologic data and clinical trials enhanced the little attention given to the pneumococcal vaccination.

Conclusion: We found the generally low level of priority given within a consultation, the missing awareness of this subject in daily practice, and the perception of epidemiologic and scientific data as insufficient, as the reasons for the low rate in pneumococcal vaccinations. Efforts to increase the epidemiologic data on the pneumococcal vaccination should be taken. To increase the vaccination rate, it would be necessary to raise the awareness and priority of the pneumococcal vaccination; a feasible way could be the combination of the seasonal flu vaccination campaign with a campaign for pneumococcal vaccination.

Keywords: prevention, Swiss primary care, barriers and facilitators, *Streptococcus pneumoniae*

Introduction

Diseases caused by *Streptococcus pneumoniae* generate substantial rates of morbidity and mortality.[1,2] Noninvasive isolates of *S. pneumoniae* are found in patients with acute otitis media or pneumonia. An invasive pneumococcal infection is defined as the invasion of bacteria into the bloodstream or into other sterile sites of the body.[3] Invasive infections with *S. pneumoniae* are clinically present as pneumonia, sepsis, meningitis, or arthritis.[4] In Switzerland, the incidence of invasive pneumococcal disease is around 15/100,000 per year for all inhabitants, around 46/100,000 per year for persons over 64 years and around 14/100,000 per year for children under the age of 2 years.[4] In 2009, lethality in Switzerland was reported to be 11% of all cases (of which 72% were

Correspondence: Ryan Tandjung
Institute of General Practice and Health Services Research, University of Zurich, Pestalozzistrasse 24, 8091 Zurich, Switzerland
Tel +41 44 255 7508
Fax +41 44 255 9097
Email ryan.tandjung@usz.ch

patients over 64 years) with the highest lethality (20%) in cases with a sepsis.[4] Resistance rates against antibiotics were recorded in around 15% of the isolates with no significant change during recent years.[4]

A 23-valent polysaccharide pneumococcal vaccine has been available for 30 years.[3] Meta-analyses have produced inconsistent results regarding the evidence of the effectiveness of pneumococcal vaccination.[1,2,5–9] Nevertheless, in Switzerland this vaccine is officially recommended by the Swiss Federal Office of Public Health[10] for all persons over 64 years and for all risk patients (whereby persons with chronic heart or lung diseases, diabetes, renal failure, HIV infection, functional or anatomical asplenia etc, are considered risk patients), regardless of their age. In contrast to these recommendations, the estimated vaccination rate for persons over 64 in Switzerland is around 2%.[11] Pneumococcal vaccinations are for the most part provided by general practitioners (GPs), but additionally, a small number of patients get vaccinated during a hospital stay.

Several studies have investigated either patients' resistance to vaccination[12–15] or general practitioners' attitudes.[12,16,17] The lack of time to verify the immunization status of the patient[12,18] or competing priorities[16] were found to be barriers for GPs. Another reason that was reported for the low vaccination rate was a considerable lack of knowledge about the incidence and the seriousness of the disease, and about the recommendation as to which patients should be vaccinated.[12] One study[18] investigated the perceived benefit of different vaccinations among GPs in Switzerland; in this study pneumococcal vaccination was assessed as the vaccination with the lowest benefit. Patients' barriers were reported as a general mistrust in modern medicine,[13] lack of awareness of the presence of such a disease and its vaccination,[12,13] and factors like avoidance of doctors in general, dislike of needles, and forgetfulness.[12] Interestingly, three studies with older people revealed that they would not accept the vaccination in hospital without a previous discussion with, and recommendation of their GP.[13,14,19] Patients' general refusal of vaccinations were shown to be an important factor in some studies,[12,16] while in another study, it was mentioned as a very rare reason to abstain from a vaccination.[18]

Even if pneumococcal vaccinations have been assessed in several studies, to our knowledge there is no qualitative study addressing GPs. Therefore the aim of our qualitative study was to investigate individual GP's views on the pneumococcal vaccination. We particularly focus on reasons for the known gap between governmental recommendations for the pneumococcal vaccination and performance in the primary care setting. With our study, we explicitly wanted to investigate why the pneumococcal vaccination is so rarely provided by GPs.

Methods

Study design, setting, and participants

This qualitative study was conducted during the winter of 2010/2011 with GPs in primary care practices in the German-speaking part of Switzerland. The semistructured and open-ended interviews took place at the GPs' practices at a time of their choice. The interviews were conducted by a staff member from the Institute of General Practice at the University of Zurich. An interview guide outlined the main aspects of the interview. Additional explanations were given when the GP did not understand the question. The interviews were recorded on a digital audio recorder; the interviewer provided additional hand notes. Prior to the start of the study, the interview guide was tested with two GPs concerning comprehensibility of the questions and logical structure of the interview.

Selection and recruitment

The aim of our study was to understand the perception and individual views of GPs concerning the pneumococcal vaccination; we did not aim for a quantitative statement, therefore, 20 GPs were included in the study.[20] With a question under study in mind, we decided to analyze with qualitative content analysis rather than with grounded theory. We sent an information letter to all GPs on a preexisting list of our GP research network of 251 GPs who once showed interest in participating in research projects. The response rate was rather low, with 28 GPs (11.2%) showing interest in participation. In Switzerland, the task of primary care differs based on geographical factors, especially with respect to the work environment of an urban region (where there may be many specialists or hospitals around) compared with a rural area (where the GP is very often the only physician in a broader region). Therefore, the final participants were chosen in a way as to obtain a representative balanced distribution with respect to rural and urban GPs.

Data analysis

The complete interviews were transcribed, and the transcriptions were analyzed following the technique of qualitative content analysis,[21] supported by the ATLAS.ti© software (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany). This qualitative method uses categories as the main instrument: categories can be built deductively – eg, according to the interview guide or based on a clinical framework – as well

as inductively – with generation of new coding categories or adaption of the categories during coding. In this study, based on the structure of the interview guide and our framework, a category system was elaborated with only minor adaption during the coding process; the categories are shown in Table 1. After the coding procedure, a synthesis of all findings was compiled in discussions with three researchers. The results and conclusions were sent to the participating GPs to ensure that the interpretation of the results was consistent with the GPs' original opinions.[22] All material from the interviews, the member validation, and the following discussions served as the basis for the final interpretative work.

Ethical approval

The study protocol was approved by the Ethics Committee of Zurich. A written "declaration of no objection" was recorded on December 19, 2011.

Results

Results are presented according to the interview guide, summarizing some chapters for a better readability.

Participating GPs

As shown in Table 2, the interviewed GPs were between 40 and 65 years old, with a mean age of 54.7 years, which is a little bit higher than the average age (53.3 years) of outpatient doctors in Switzerland.[23] Participants had between 7 and 32 years of practical experience, with a mean of 20.3 years. Three of the 20 participants were female, 17 were male. Sixteen GPs worked full time and four worked part time. Thirteen participants worked in an urban or suburban region, while seven participants worked in a rural area. According to the statistics of the Swiss Medical Board,[24] out of the 5800 general practitioners/general internists, 4262 (73.5%) were male, so in our sample study, the women are slightly underrepresented. Unfortunately there is currently no valid statistic on average workload in Swiss primary care.

Table 1 Category system for coding

Coding categories and subcategories
I. Pneumococcal disease
A. Evaluation of the pneumococcal disease
II. Pneumococcal vaccination
B. Evaluation of the pneumococcal vaccination
B1. Evaluation of the effectiveness
B2. Evaluation of the side effects
C. Basis for the decision for/against the pneumococcal vaccination
C1. Ministry of Health/experts' opinion
C2. Scientific studies
C3. Other reasons
D. Indications for the pneumococcal vaccination
E. Reasons to omit the pneumococcal vaccination
E1. Awareness for the topic too low
E2. Time constraints/low priority of the pneumococcal vaccination
E3. Unclear data
E4. Patient's refusal
E5. Medical contraindications
E6. Other reasons
F. Interventions to increase the vaccination rate
F1. Doctors' level
F2. Patients' level
F3. Other ideas
G. Other important aspects

Note: Coding system: categories and subcategories for the coding process used with the ATLAS.ti© software.

Table 2 Sociodemographic data of the participants

Attribute	Value
Age	40–65 years (mean 54.7 years)
Practice experience	7–32 years (mean 20.3 years)
Sex	15% female (n = 3)
	85% male (n = 17)
Workload	20% part time (n = 4)
	80% full time (n = 16)
Practice region	35% rural (n = 7)
	65% urban/suburban (n = 13)

GPs' evaluation of the pneumococcal disease and its vaccination

Most GPs acknowledged that diseases caused by *S. pneumoniae* were potentially severe, with high morbidity and mortality. Nevertheless, all GPs stated that they had hardly ever seen patients with proven invasive pneumococcal disease in their own practice.

> I have simply never seen [a pneumococcal infection], nor have I ever heard of a patient of mine suffering of an [pneumococcal infection]. [GP13, m, 65y]

As a limiting factor, the GPs stated that normally they did not take smear tests in patients with respiratory infections, and empiric therapy was started without knowing the causative organism for the infection. Generally, the vaccination was perceived effective by the majority of the GPs, but most of the GPs stated that they had no possibility of verifying the effectiveness in their daily practice.

> I can't say anything about the effectiveness of the vaccination from my daily experience, because I don't know, if a patient really had a pneumococcal disease and if this would have been preventable with the vaccination. [GP3, m, 48y]

None of the GPs had experienced noteworthy side effects of the vaccination in their patients.

GPs perceived the data about the epidemiology of pneumococcal diseases and the effectiveness of the pneumococcal vaccination as too weak.

> I think … The data are not really here … That's my impression. [GP5, m, 53y]

Even though most of the GPs stated they had not read original studies to assess the epidemiological situation regarding pneumococcal diseases and the efficacy of its vaccination, they based their opinions on controversial discussions, for example from some experts' lectures. Furthermore, the GPs' motivation to follow governmental recommendations and provide the pneumococcal vaccination was very low.

> Finally, we have no program to promote the pneumococcal vaccination. I feel the theoretical "It should be done …" but not the clear "Do it!" from the government. [GP1, m, 56y]

Overall, GPs stated that of all of the recommended vaccinations, the pneumococcal vaccination was the least important.

Lack of awareness and time constraints as barriers

One of the most often stated reasons to omit the pneumococcal vaccination was that the GPs simply forgot to discuss the vaccination with their patients. There were different reasons for this: First, pneumococcal diseases were not considered an important problem in daily practice.

> The importance is not really given in daily practice … I think it is not really perceived as a problem. [GP9, m, 42y]

Second, with most of the patients, other diseases, problems, or even other vaccinations were more important and had to be solved or discussed first.

> For me, it's just a question of priorities … There are many issues that are much more important than the pneumococcal vaccination. [GP12, f, 59y]

Due to the permanent time constraints in the GPs' daily practice, after the solving of acute health issues, there was just not enough time left to discuss the pneumococcal vaccination. Furthermore, none of the GPs had ever had a patient asking about the pneumococcal vaccination; GPs stated that some patients did not even know this vaccination exists.

Concerning the patients' opposition to vaccinations, only general opposition against vaccinations (mostly with regard to the seasonal flu vaccination) was discussed, since the topic of a pneumococcal vaccination was often not brought up at all. Several GPs stated that in patients where the vaccination was actually discussed, opposition was hardly seen.

Interventions to increase the pneumococcal vaccination rate

The GPs mentioned several possible interventions that could increase the vaccination rate, even though not all of them were really convinced that the vaccination rate should be increased at all. From a professional perspective, GPs proposed an improvement of the data regarding the epidemiology of the pneumococcal disease and the effectiveness of the pneumococcal vaccination.

> The vaccination rate could be positively influenced if the existing data would be declared clearly and GPs would be transparently informed about the benefits and harms of the vaccination … Number needed to vaccine, number needed to harm … Really proved in good studies … [GP3, m, 48y]

Furthermore, they highlighted the importance of a good vaccination campaign, but the discussion about who should provide and support this campaign was very controversial: half of the GPs wanted the Swiss Federal Office of Public Health to conduct such a campaign;

> On a doctor's level, there should be a vaccination campaign from the Federal Office of Public Health, once again … [GP20, m, 54y],

the other half explicitly did not believe in the success of a campaign conducted by the Swiss Federal Office of Public Health.

> There should be better publicity, but not from the Federal Office of Public Health, because this is a suspect authority! [GP16, m, 46y].

Taking the patient perspective, GPs proposed a combination of the pneumococcal vaccination with the influenza vaccination campaign, to provide a free vaccination; and to sensitize society for the pneumococcal disease via mass media, for example with TV commercials or on medical websites.

> In medicine, it has always worked if something was brought to the mass media… [GP12, f, 59y]

Discussion

Main findings

Despite its being an official recommendation of the Swiss Federal Office of Public Health, the vaccination of several

population subgroups against pneumococcal diseases, is not at all implemented in routine primary care. As reasons for the nonadherence to these guidelines, we found a generally low priority given to the pneumococcal vaccination, the missing awareness for this subject in daily practice, and the perception of the epidemiologic and scientific data as insufficient, as well as a lack of trust in governmental organizations.

Lack of awareness of pneumococcal diseases

Although all participating GPs evaluated diseases caused by *S. pneumoniae* as potentially severe with the risk for serious complications, they stated that it is generally not perceived as a problem in daily practice. The low level of publicity is also represented in the fact that on the patients' side, pneumococcal vaccination had not been mentioned thus far. Interestingly, even while most participants mentioned general reservation towards vaccinations was very common among their patients, they had thus far very seldom had a specific opposition to the pneumococcal vaccination. In contrast, earlier studies have found patients' opposition to vaccinations to be a relevant patient factor.[12,16] The missing opposition is, of course, limited by the fact that the subject of pneumococcal vaccination is virtually absent during most consultations.

In addition, in Switzerland, hospitalization of patients with severe health problems is not mandatorily initiated by the GP. So most of the patients with a severe pneumococcal infection are not seen by their GP, but go directly into the hospital on their own. The resulting rarity of the pneumococcal disease in daily practice obviously worsens the lack of awareness of a GP. The studies by Ridda,[13] Mieczkowski,[12] and Zimmerman[15] found the lack of knowledge to be a main barrier against the pneumococcal vaccination. In our study, we were not testing the current knowledge of the participating GPs, therefore, a clear differentiation between lack of knowledge and lack of awareness was unfortunately not possible.

Low priority of the pneumococcal vaccination in daily practice

As stated by the interviewed GPs, among all medical problems, the pneumococcal vaccination is quite at the end of the list of priorities in daily business. In elderly, often polymorbid patients, more acute problems have to be solved first. Due to time constraints, there is very often no time left to talk about themes of second priority, like pneumococcal vaccination or preventive topics in general. Consistent with the findings of Bovier et al in 2005,[18] most of our GPs also rated the pneumococcal vaccination as the least important of all vaccinations. In addition, in patients with a rather critical attitude to vaccinations in general, GPs omitted the discussion of additional vaccinations, like the pneumococcal vaccination, to avoid a fundamental refusal of the more essential, basic vaccinations. Unfortunately, our study design did not allow us to differentiate between the time the discussion for a pneumococcal vaccination was actively omitted by the GP and when it was simply forgotten due to other priorities.

Insufficient epidemiological data

Even though the participating GPs stated that they had not read original studies about pneumococcal vaccination, most of them mentioned that data regarding the epidemiology of the pneumococcal disease and the effectiveness of the vaccination were not sufficient to convince doctors and patients of the need for vaccination. The majority of the GPs formed their opinions regarding vaccinations by reading official study summaries or listening to experts' lectures. Obviously these conclusions and lectures were not convincing enough to lead these GPs to provide the pneumococcal vaccination more often.

All GPs expected clear recommendations for physicians from the government and more support for their implementation in daily practice. This is an interesting finding in light of the already existing recommendations published by the Swiss Office of Public Health. Additionally, there was no consensus about which (governmental) organization would be most effective and have the greatest physician acceptance to successfully promote such a campaign.

Implications for future research and practice

At the patient level, the GPs proposed the provision of an educational campaign about the pneumococcal disease and its vaccination, for example over mass media and on an official website. Such campaigns are quite common; in Switzerland, an annual campaign on seasonal flu vaccination ("flu vaccination day") is organized by the Swiss government in cooperation with the Swiss Board of primary care. As uttered by one study participant, an extension of the campaign to include pneumococcal vaccination would be feasible; especially regarding similar target populations. This would most likely be accepted by patients and the majority of GPs.

One participant suggested that pneumococcal vaccination should be free of charge. Switzerland has a complex system with mandatory insurances, but patients must pay a predefined

deductible amount of between 300 and 2500 CHF (Swiss francs) and an additional 10% of all costs above that amount. It can be therefore concluded that overall, most of the patients have to pay for the pneumococcal vaccination themselves. In adults, this payment system does not differ from other vaccinations – unfortunately, valid data about vaccination rates (for example, tetanus in adults) is not available. In 2009, the vaccination campaign against H1N1 virus was funded by the Swiss government and a higher vaccination rate was reached. This campaign was also accompanied by a mass media campaign. It is not possible to distinguish between the effects of the cost of the vaccination and the publicity of the disease on the higher rate of vaccinations.

Obviously, the epidemiologic data on vaccination has so far not persuaded GPs, and clearer data on the efficiency of the vaccination should be obtained. It is questionable as to whether a clearer statement by the government alone will raise the vaccination rate: First, the guideline is actually already very clear. Second, several of the GPs mentioned their mistrust of recommendations of the Federal Office. And finally, a clearer statement would not change the daily issues of time constraints and lack of awareness. Integrating the subject into peer discussions might be more reasonable and effective.[25,26] In Switzerland, about half of the GPs are members of primary health care networks and are therefore regularly participating in "quality circles" (peer-group discussions to improve quality of care). This effect might be limited by the fact that quality circles are working autonomously and with no regulation of scheduled topics. Our study showed a very low priority given to the pneumococcal vaccination in daily practice. However unfortunately, we could not differentiate between the physician actively omitting the subject of pneumococcal vaccination and forgetting to bring up the subject during consultation. Further interventions such as standing order programs for nurses (as exist in the US)[27] might also be very promising for Swiss primary care. Thus far, delegation to nonphysicians in Swiss primary care is seldom done, but in the light of time constraints, organizational adjustments in Swiss primary care show promising potential.[28] Furthermore, intervention such as electronic medical record reminders[29] might help to bring the discussion into the consultation. In 2007, the distribution of electronic medical records in primary care was still in its infancy in Switzerland,[30] but in the future, a higher rate can be expected.

Limitations and strength of the study

Our results should be considered with the limitations of all qualitative research. The recruiting procedure, with registration based on interest, and the low response rate can cause a selection bias because maybe only well-informed and highly interested GPs agreed to participate. Furthermore, with a qualitative study, we collect single opinions, so the transfer of our results to other populations is limited. For the analysis, we chose a qualitative content analysis rather than grounded theory. Both qualitative research methods are based on categories: while in qualitative content analysis the question of the study is kept in mind and the main findings are discussed in a summarized form, the analysis in grounded theory is open minded and without a summary of interview findings. We offset the hazard of losing information by summarizing analyses and categories independently. We compared the categories and found a high rate of agreement. The strength of a qualitative study is that individual experiences and opinions can be investigated to build new theories and hypotheses. In that we interviewed GPs with very different sociodemographic backgrounds, we were able to show a broad spectrum of opinions. Nevertheless, we reached a good level of saturation with the number of interviews, since in the last interviews, no real new aspects were mentioned.

Conclusion

As reasons for the low rate of pneumococcal vaccinations, we found a generally low priority given to this within a consultation, missing awareness of this subject in daily practice, and the perception of the epidemiologic and scientific data as insufficient. Efforts to increase the epidemiologic data on the pneumococcal vaccination should be invested. To increase the vaccination rate, it would be necessary to raise the awareness and priority of the pneumococcal vaccination with information campaigns for doctors and patients. One feasible way could be to combine the seasonal flu vaccination campaign with a campaign for pneumococcal vaccination. Further interventions such as electronic medical records reminders or standing order programs should be the focus of future research.

Authors' contributions

All four authors made a substantial contribution to this manuscript ie, study conception, data collection, data analysis, or manuscript drafting.

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Supplementary materials

Interview guide for the in-depth interviews

Interview guide for interviews

1. How do you assess the pneumococcal disease from your primary care point of view?
   Specification if necessary:
   - Is the disease relevant/frequent in your daily practice?
   - Is the pneumococcal disease an overestimated or an underestimated disease?
2. How do you assess the pneumococcal vaccination from your primary care point of view, especially regarding its effectiveness and its side-effects?
3. On what do you base your decisions for/against the pneumococcal disease?
4. During the last years, there have been several studies and meta-analyses regarding the pneumococcal vaccination.
   - Did you follow the discussions?
   - Do studies generally play an important role for your decision for/against the pneumococcal vaccination?
5. The vaccination rate for pneumococcal diseases is relatively low in Switzerland.
   - What do you think are the reasons for this?
   - Is this low vaccination rate a problem at all?
   - How could the vaccination rate be increased (if necessary)?
6. Which patients should be vaccinated against pneumococcal diseases in your opinion?
   - What are the reasons to omit the pneumococcal vaccination?
7. What are your experiences with patients regarding the pneumococcal vaccination?
   Specification if necessary:
   - How many patient come to your practice on their own to get vaccinated?
   - How many patients can you convince for the vaccination?
   - Are there general barriers against the vaccination?