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A study of antibiotic prescribing: the experience of Lithuanian and Russian GPs

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Abstract (193 words)

Background. Globally, general practitioners (GPs) write more than 90% of all antibiotic prescriptions. This study examines the experiences of Lithuanian and Russian GPs in antibiotic prescription for upper respiratory tract infections, including their perceptions of when it is not indicated clinically or pharmacologically.

Methods. 22 Lithuanian and 29 Russian GPs participated in five focus group discussions. Thematic analysis was used to analyse the data.

Results. We identified four main thematic categories: patients' faith in antibiotics as medication for upper respiratory tract infections; patient potential to influence a GP's decision to prescribe antibiotics for upper respiratory tract infections; impediments perceived by GPs in advocating clinically grounded antibiotic prescribing with their patients, and strategies applied in physician-patient negotiation about antibiotic prescribing for upper respiratory tract infections.

Conclusions. Understanding the nature of physician-patient interaction is critical to the effective pursuit of clinically grounded antibiotic use as this study undertaken in Lithuania and the Russian Federation has shown. Both physicians and patients must be targeted to ensure correct antibiotic use. Further, GPs should be supported in enhancing their communication skills about antibiotic use with their patients and encouraged to implement a shared decision-making model in their practices.

Keywords: antibiotics, upper respiratory tract infections, general practitioners, physician-patient relationships, Lithuania, Russian Federation.

Introduction

Globally, general practitioners (GPs) write more than 90% of all antibiotic prescriptions, the majority for patients with respiratory tract infections [1, 2]. Indiscriminate use of antibiotics facilitates the development of bacterial resistance, which is associated with longer hospital stays, greater morbidity and mortality, and increased health care costs. For example, it has been estimated that in 2007 approximately 25,000 patients in the European Union, Iceland and Norway died from being infected with antibiotic-resistant bacteria. The estimated economic costs that year, including outpatient care, added inpatient costs and productivity losses were approximately €1.5 billion [3]. As a result, considerable interest has arisen in making antibiotic prescribing practices more rational, particularly in primary care [4-9].

Although the decision to prescribe antibiotics is made during physician-patient consultations, it is not a simple one-way process from doctor to patient [10]. In addition to medical indications, numerous non-pharmacological factors have been shown to play a role. Research aimed at understanding the motivations behind prescribing practices has established solid links between antibiotic prescription and a physician's uncertainty about optimal diagnosis and treatment [11,12], knowledge about the patient and fear of legal action if the patient's health deteriorates [13], clinicians' workloads [11,12], communication skills that might help reveal patient expectations [14], and the ability and willingness to address specific misunderstandings related to antibiotic use [15]. There is also a large body of research on patient factors that affect a physician's decision to prescribe antibiotics: patients may misunderstand the efficacy of antibiotics [16,17] and too often expect to receive them [18]. A prescription for antibiotics then becomes as important a determinant of patient satisfaction as the information and reassurance provided by physicians [19].

Antibiotic use is also affected by the current physician-patient relationship paradigm, as embodied in the medical consultation. The shift from an often paternalistic approach to the active patient participation that Tuckett and colleagues describe as a "meeting between experts" [20] has been one of the great changes, in some settings, of medical practice at the end of the 20th century [21].

Encouraging people to be more knowledgeable about their health status and more “consumerist” in realizing their choices has contributed significantly to this shift [21]. However, the increasing responsibility that patients are assuming – for medicating themselves and for making decisions jointly with their physicians – has serious implications. Studies in the United States [22] and the United Kingdom [23] have revealed increasing self-medication with antibiotics as a latent threat to public health. The fact that the public is becoming better informed about the need for rational antibiotic use at the same time that it is self-medicating itself more with antibiotics could have several explanations. For instance, people may entertain doubts about the true need for clinically grounded antibiotic use. Or perhaps they simply do not want to sacrifice what they perceive as personal health benefits for the common good [24]. This social phenomenon merits further research as it highly likely that empowered patients advocating for their preferences in medical encounters can strongly affect antibiotic prescription decisions in some settings.

The varied nature of physician-patient communication in different regions of Europe may also be related to differing antibiotic prescribing patterns, leading to regional differences in bacterial resistance [25,26]. Eastern European countries face higher rates of antibiotic resistance than northern European countries, for example, and it is likely related to a higher consumption of antibiotics [25]. However, very little research has investigated the links between antibiotic prescribing practices and non-clinical factors in post-Soviet countries. Studies performed in Lithuania and Russia have primarily addressed the antibiotic use profile [27-30], the relationship between antibiotic use and bacterial resistance [31,32], and public beliefs and knowledge about antibiotic use and self-medication [33,34]. To our knowledge, no qualitative studies addressing the non-clinical factors of antibiotic prescribing have been performed in Central and Eastern Europe. Thus, the rapid "erosion of hierarchy in physician-patient relationships" [35] that followed radical social changes in post-Soviet countries and antibiotic prescription patterns remains understudied.

This study examines the experiences of Lithuanian and Russian GPs in prescribing antibiotics for upper respiratory tract infections, including their perceptions of when it is not prudent or indicated clinically or pharmacologically. These countries had a similar historical practice of antibiotic prescribing as Lithuania was part of Soviet Union for 50 years. However, actual antibiotic prescription and dispensing policies have some differences. Firstly, Russian GPs had official clinical guidelines for upper respiratory tract infection treatment, while in Lithuania there were only approved treatment

guidelines for lower respiratory tract infections. Secondly, antibiotics in Russian pharmacies are available over-the counter, which is not the case in Lithuania.

Methods

This paper reports on one component of the Health Alliance for Prudent Prescribing, Yield and Use of Antimicrobial Drugs in the Treatment of Respiratory Tract Infections (HAPPY AUDIT). This three-year (2007–2010) European Union project applied the Audit Project Odense (APO) method to try to influence physicians' to be more prudent when prescribing antimicrobial agents (antibiotics) in six countries, which were chosen in part for their differing prevalence of antibiotic resistance: Argentina, Denmark, Lithuania, the Russian Federation (Kaliningrad region), Spain and Sweden [36].

It focuses on the participants from Lithuania and the Russian Federation, the two project countries with the highest prescription rates for upper respiratory tract infections. In total, 31 GPs from Lithuania and 39 from the Kaliningrad Region of the Russian Federation took part in the HAPPY AUDIT project. The focus groups sessions were scheduled within periodic project educational meetings in Lithuania and Russia. All project participants knew beforehand about this qualitative study, those who assisted in project meetings (30 from Russia and 22 from Lithuania) were invited to take part in this study, which the Kaliningrad Association of Family Doctors and the Bioethics Committee of Klaipeda University, Lithuania, approved in 2008. We explained that the study would explore GP experiences and attitudes towards antibiotic prescribing in general practices. We guaranteed participants confidentiality and explained the planned publications to them. Twenty-two Lithuanian and 29 Russian GPs agreed to take part in the focus groups (1 GP from the Russian Federation declined for personal reasons).

All focus groups participants knew each other for at least one year as they were involved in the HAPPY AUDIT activities previously. We therefore expected that the GPs would feel comfortable

with each other and more easily engage in discussions [37]. As all GP were voluntarily involved in the project, which dealt with a more cautious approach to antibiotic prescribing, and presumably had strong interest in the issue, we gave a priority to focus groups discussions instead of individual interviews as participants' interaction in the group could be richer and deeper than those obtained from individual interviews [38] and helps elicit a diverse range of opinions and experiences [39].

We conducted two focus group discussions in Lithuanian (11 participants each) and three in Russian (9-11 participants). Two GPs (a moderator and a note-taker) facilitated each discussion. The principal investigator has a degree in applied sociology as well as being a medical doctor; the second facilitator completed introductory training in qualitative reasearch methodology and data analysis. Participants provided written informed consent. The discussions lasted approximately two hours, and they were audio-taped with the participants' permission.

The focus groups discussions followed a semi-structured topic guide. Typically, the discussions addressed the GPs' experiences with antibiotic prescriptions that were not grounded in clinical necessity, their attitudes toward antibiotics for upper respiratory tract infections, the criteria they used in practice to choose specific types of antibiotics for these infections, and their thoughts about interventions that could improve the practice of prescribing antibiotics. The moderator kept the focus groups informal and encouraged experiential narratives. After the discussion, the two facilitators discussed the communication among participants and whether the topic guide needed any refinement. Although the core schedule of focus groups remained the same throughout the study, the format of each focus group differed as following discussions were based on issues revealed by the physicians themselves. After the first four focus groups (two with Lithuanian GPs and two with Russian GPs) no new information emerged in the discussions. Nevertheless, a last focus group was held.

The moderator and the note-taker transcribed each discussion verbatim and initiated the thematic analysis [40] after all five focus groups were completed. The focus groups with Lithuanian GPs were

performed in Lithuanian and for the Russian GPs in Russian. As the moderator and the note-taker were bilingual, the transcripts were analysed in the original languages. Codes were generated from the transcripts in a systematic matter for the entire dataset by reviewing the data line by line. They were named by using words as close as possible to the participants' own. The facilitators then identified and systematically compared similarities and divergences in the coding of the different transcripts, discussing each code that emerged until they could agree upon its suitability for the study. They placed closely related codes into thematic categories, labelled them and then translated from Lithuanian and Russian to English.

These thematic categories were then reviewed, refined, named and illustrated with quotations from the discussions. In the quotations presented below, we have used a bracketed ellipsis, or […], to indicate the omission of words, and an unbracketed ellipsis, or …, to indicate a reflective pause. Where we have tried to clarify participants' meaning, our interpretations appear in brackets, e.g., [antibiotic].

This paper analyzes only the non-pharmacological aspects of antibiotic prescription that relate to physician-patient relationships. There was a set other non-pharmacological factors that arose – such as industry efforts to promote non-rational antibiotic use or the indifference of policymakers and regulatory authorities' to rational antibiotic use. Although these aspects are important, in this paper we have not intended to describe all non-pharmacological factors; instead have concentrated on their impact on physician-patient communication about antibiotic prescription.

Results

Respondents

The age and the gender structure as well as the location of practice (urban/rural) were comparable between Russian and Lithuanian participants (Table 1); however, their full demographic profiles were not homogeneous. Russian GPs practised more often as solo practitioners (31% versus 9% of Lithuanians). Slightly more than half of the Lithuanian GPs worked in privately owned primary health care centres with contracts with the Lithuanian National Health Insurance, all Russian GPs worked in

public health care settings (there were no privately owned primary health care centres with contracts with insurance companies in Kaliningrad). All Russian GPs had undergone vocational training in general practice. The same pattern of professional development was experienced by 60% of the Lithuanian participants. Others joined a family practice after residency (Table 1).

GPs' experiences in antibiotic prescription for upper respiratory tract infections

There were four final thematic categories defined:

1. Patients faith in antibiotics as medication for upper respiratory tract infections;
2. Patient potential to influence GP decision to prescribe antibiotics for upper respiratory tract infections;
3. Impediments perceived by GPs in advocating clinically grounded antibiotic prescribing with their patients;
4. Strategies applied in physician-patient negotiation about antibiotic prescribing for upper respiratory tract infections.

Patients' faith in antibiotics as medication for upper respiratory tract infections. The GPs in the focus groups emphasized the context of their everyday practices where they face patients with very high expectations for antibiotics. Study participants indicated the low patient tolerance for the natural course of illness, compounded on the one hand by a desire to avoid any discomfort and on the other by faith in the "miracle action of antibiotics". (Russian Federation)

> "You want to proceed without prescription of antibiotics […] but a patient tells you: I can't go on further, that's all. I want them [antibiotics] now." (Lithuania)

According to the participating GPs, patients perceive antibiotics as a chance to "resolve" an acute respiratory tract infection promptly -"you take it and become healthy" (Russian Federation) – or at least to guarantee no complications. However, rapid relief from clinical symptoms is not the only promise of antibiotic prescription. GPs feel that antibiotics are so closely bound with upper respiratory tract infections that antibiotic prescriptions become an essential and even ritual part of medical consultations for this type of infection.

"If a person comes to a consultation and he has been ill for 3-4 days, he expects the doctor to prescribe antibiotics. And if it is not prescribed, there is a complaint about the doctor". (Russian Federation)

It was reported that the prescription of antibiotics provide a strong sense of security for patients - it is "proof" that their health condition is taken seriously: "the patient himself feels, that it was not an unnecessary visit, that he is treated, if he gets those antibiotics" (Lithuania).

In such a situation, the well-known side-effects of some antibiotics – rashes and diarrhoea – are often not perceived as threatening and eventually people are willing to ignore or tolerate them.

"Sometimes people, they start treatment themselves. They don't understand how self-treatment is harmful. They are not afraid to take antibiotics. Not afraid at all. They think that, well, rashes or diarrhoea; it's not so bad". (Russian Federation)

Patients' potential to influence a GP's decision to prescribe antibiotics for upper respiratory tract infections. Most participants acknowledged patients' increasing power in medical encounters and growing persistence in advocating their own perspectives on their health. Patients hoping to get antibiotics expressed their expectations explicitly or implicitly and pushed for it strongly:

"They come with their own opinion, and if they come with their opinion, then [...] you can beat your head against the wall, [but] you must prescribe them [antibiotics]." (Lithuania)

Patients' assertion of power in physician-patient communication, according to the GPs, is due to the general population's improved access to medical information and knowledge of the opportunity for legal consultation.

"We are unsafe because of Lithuanian laws. Totally unsafe. All these laws on patients' rights…. They [patients] are demanding a lot, they read on the Internet, […] and they insist, simply insist on antibiotics. And we record in the medical chart, "In accordance

with the patient's demand, we have prescribed one [medication] or another." (Lithuania)

According to the participants, patient pressure to prescribe antibiotics is compounded by the fact that patients can obtain antibiotics elsewhere. Patients could simply begin treatment themselves using leftovers or they can be prescribed by other physicians ("If he wants, he will visit another doctor where he will get a prescription anyway" (Lithuania)) or bought over the counter in Russian pharmacies ("You can buy antibiotics in the pharmacy 24 hours a day – without a prescription, without anything" (Russian Federation)). The dilemma of prescribing antibiotics or not has thus become more complex. The fact that persistent patients can obtain antibiotics elsewhere often impedes physicians from arguing strongly against non-clinically grounded prescriptions.

Impediments perceived by GPs in advocating clinically grounded antibiotic prescribing with their patients. Both Lithuanian and Russian GPs said they encountered similar difficulties in advocating rational antibiotic use during medical consultations: a lack of near-patients test (point-of-care testing), the absence of a comprehensive policy for rational antibiotic use, and the reality of general practitioners that requires doctors to cultivate good relationships with patients and their families.

When refraining from antibiotic prescribing for upper respiratory tract infections, GPs often feel insecure with regards of their professional safety. Physicians confessed that they very often had to make the decision about antibiotic prescription while lacking evidence for the nature and gravity of the illness; the CRP (C reactive protein) and Strep A test are not routine tests neither in Lithuania nor in Russia. Wider accessibility of near patient tests is perceived by informants widely as the safety guaranty not only for patient, but for physicians as well.

"Good CRP – relief for me and they [patients] are especially relieved. So, that is a very solid help. Because let's say the hardest pressure, when we had no CRP [CRP was provided for physicians

during the HAPPY AUDIT project], was when the child had a fever for 5-7 days: the child is active, cheerful, playing with toys, but has a fever of up to 39 for seven days. Even it is not permanent fever. The blood test is normal, urine – fine, but you still tensed because there is fever. You perform CRP – it is normal. Then after 2 more days you are relaxed even he has fever. "(Lithuania)

GPs from both countries also expressed a sense of having to solve the problem of antibiotic over-prescription for upper respiratory tract infections on their own. Aggressive clinical guidelines call for a broad spectrum of antibiotics. Experts from internal audit and external oversight institutions support the notion that using antibiotics for upper respiratory tract infections helps patients recover faster and cuts insurance expenditures, impeding GPs' efforts to cut down on antibiotic prescriptions.

> "Because I know that the social insurance system [which oversees sick leaves] always checks the treatment and whether antibiotics are prescribed or not, I always write that I've prescribed them on the medical chart, even if I don't in reality. Because it is a problem if someone takes sick leave for 14 days, even 7 days, say for acute bronchitis, and does not receive antibiotics." (Lithuania)

Study participants from both countries emphasized the difficulties of how to resist patients' pressure for antibiotics while maintaining good relationships with them and their families. It seems that this balance is often outweighed by the striving to please the patient.

> "The patient, five days coughing, no fever. It would be possible to avoid antibiotics, right? But I know that she will go straight to another doctor and he will prescribe them. And I will be stupid doctor and... I will have to work, I have my people. Do you get it? What will be the opinion about me, and how to work then? So, this is so." (Russian Federation)

Strategies in physician-patient negotiation about antibiotic prescribing. The resulting desire of GPs to fulfil patient expectations, whether or not they are expressed explicitly, has consequences for antibiotic prescription for upper respiratory tract infections.

GPs' limited ability to confront patient demands for antibiotics is also compounded by the limited time available during a consultation to present the rationale behind *not* prescribing them ("You need to sacrifice a lot of time to explain" (Lithuania)). Patients who do not receive antibiotics tend to request more consultations, but the time needed to provide them is also limited ("Physically you can't see the person every day because you simply have no time" (Lithuania)). Accordingly, GPs have developed several strategies to communicate the need for clinically grounded antibiotic use to their patients. Although these strategies overlap, they are based mainly on direct conflict avoidance and responsibility sharing.

First, since good patient relationships are critical to GPs, they reported often trying to avoid conflict with patients while discussing antibiotic prescription. Then the need for rational antibiotic prescription is communicated, illustrating the risks of non clinically indicated prescription. Physicians tend to appeal to both emotion and reason while enumerating those risks. But if the persuasion of the patient is not effective, physicians generally aim to avoid the conflict by prescribing antibiotics.

> "I would usually try to explain: this is a viral infection - his wife was sick, his son was sick - antibiotic will not help him and even can cause diarrhoea. But if the person is persistent, these explanations are useless and I would prescribe antibiotics." (Russian Federation)

> "I would try to talk further […], maybe to create a story about the future life of a child, about his immunity, and then about the harm of antibiotics. And sometimes if that did not help, I would prescribe. I wouldn't risk a conflict." (Lithuania)

Second, delayed prescription is a way for physician and patient to take responsibility and make decisions together. The participating GPs described delayed prescriptions as an instrument for

decreasing patient flow, increasing patients' sense of protection, and encouraging them to assume more responsibility for their own health.

> "Some [mothers] come in with the belief that they must get a prescription for antibiotics. I never, almost never, argue with them, but I do say, "I'm not going to prescribe antibiotics for your child due to their condition. I'll prescribe it instead for your peace of mind, but you shouldn't really even buy it. You can buy it […] when you really need it." Then I describe the symptoms of a child in poor health and explain when she should buy it." (Lithuania)

Discussion

This study has shown the difficulties that Lithuanian and Russian GPs face in their everyday task of discussing antibiotic use for upper respiratory tract infections with their patients. It identified patients' belief in antibiotics as medication for upper respiratory tract infections and physicians' lack of effective strategies for implementing antibiotic prescription guidelines appropriately as leading to situations in which patients' potential to influence a GP's decision to prescribe antibiotics often outweighs physicians' ability to advocate clinically grounded antibiotic use. Over-prescription of antibiotics could be interpreted as a warning sign of difficulties experienced by GPs in addressing their own professional uncertainty, patient expectations and clinical guidelines.

The study was undertaken in two different countries; however, the single difference in GPs' experience was related to the circumstance that antibiotics in Russia are available in pharmacies without a prescription, which is not the case in Lithuania. The similarities in physicians' perceptions could be explained geographically: Lithuania border with Kaliningrad region, which is geographically and historically separated from the rest of Russian Federation. The dramatically increased antibiotic

availability after the collapse of the Soviet Union could also have a potential impact on the attitudes of Lithuanian and Russian physicians and communities towards antibiotic use.

General practitioners in Lithuania and the Kaliningrad Region of the Russian Federation often see patients who are overenthusiastic about the potential of antibiotics. Apart from medical relief, the prescription of antibiotics was reported as proving that their condition was assessed rigorously, which makes the patient feel more secure. Other studies confirm that not only Lithuanian and Russian patients are very confident about the efficacy and safety of antibiotics [41], though there are data that GPs could overestimate patients' expectations for antibiotics. A German study based on audio-recorded consultations of GPs for acute cough [14] found that normally patients' expectations for antibiotics are not addressed directly or indirectly. As a result, GPs can have an erroneous understanding of patient expectations. Our study suggests that a more holistic approach to antibiotic prescribing could help identify some aspects that people commonly relate with antibiotic use and eventually substitute them with other means. For example, introducing near patient tests could strengthen patients' feelings of care and security (usually provided by prescribed antibiotics) without negative effects on patient satisfaction [42] and, according to Butler et al [43], could be valuable in "selling" the decision to not prescribe antibiotics.

As patients become more informed about health issues, they feel more empowered to make demands and their own decisions. These developments are not only apparent in Lithuania and Russia. As Horton has noted, the fundamental change in medical encounters has been due to patient access to information [44]; it has eliminated some of the power differential between doctor and patient and increased people's ability to care for themselves [21]. However, in Lithuania and Russia these changes were not gradual, but rather rapid, following the collapse of the Soviet Union in 1991. This rapid change was not easy for physicians to adapt to. That could explain why GPs lack effective strategies to ensure clinically grounded antibiotic use and why when negotiating antibiotic use the final decision is often left to the patients. Moreover, studies indicate that antibiotic prescriptions increase overall patient satisfaction, although this finding is not consistently found [45].

Yet as people become more involved in making clinical decisions [46], the need for them to become more involved in the "movement" for clinically grounded antibiotic use is also growing. Patient education about antibiotics cannot be left only to medical practitioners. Public engagement in the control of bacterial resistance should be promoted and beliefs on excessive use of antibiotics should be targeted for change [41], just as many countries have targeted perceptions about tobacco and saturated fats [47]. One initiative with this goal is European Antibiotic Awareness Day, which emphasizes "the need for people to take antibiotics only with a prescription and as prescribed" [48].

However, such campaigns are only a first step. This study indicates that primary care providers in Lithuania and the Russian Federation lack effective strategies to communicate to "empowered" patients the need for clinically grounded antibiotic use. Physicians need to be supported in enhancing their communication skills about antibiotic use with their patients. Existing research provides the evidence for the efficiency of this approach in other countries. Cals et al. [49] demonstrated a two-fold decrease in antibiotic prescription for lower respiratory tract infections after implementation of a communication skills intervention program for general practitioners. A study Tonkin-Crine et al. [50] listed the facilitation of more patient-centred care among the most promising interventions to promote prudent antibiotic use. A cluster randomised controlled trial [51] showed that providing an interactive booklet on respiratory tract infections as a resource during the consultation led to a 21% absolute risk reduction in antibiotic prescription as compared to a control group, without significant changes in patients satisfaction.

Moreover, our study points to the importance of implementing a shared-decision-making model in the everyday practice of primary health care practitioners. Our findings suggest that delayed prescription of antibiotics persists as a popular way for some GPs to encourage more clinically grounded antibiotic use. Other countries' experiences indicate that delayed prescriptions could result in up to three times lower antibiotic use (32% of patients used antibiotics in a delayed prescription group, in contrast to 93% of patients in an immediate prescription group) and only slightly lower patient satisfaction (87%

versus 92%) [52]. This strategy could also be helpful for GPs to address patient's pressure [53]. Even in countries where patients' expectations to get antibiotics are not very high (e.g. Norway), delayed prescription is perceived by GPs as a practical solution that could help to meet patient needs and avoid seeking after-hours care if their condition worsens [53]. Moreover, a randomised trial [54] demonstrated that delayed prescription is effective in modifying behaviour during follow-up consultations, leading to a lower rate of follow-up consultations among those that had delayed prescriptions as compared to those prescribed right away. Ultimately, formalizing and promoting a delayed approach could become an integral part of an effective rational antibiotic use policy. However, more research is needed to determine the potential effects of the introduction of delayed prescription in Lithuania and the Russian Federation as well as to test the hypothesis that promotion of a delayed approach would encourage physicians and patients to share responsibility for antibiotic use in these countries.

In spite of the clear results, the views and experiences of the participants cannot be generalised to represent those of the greater general practice community since the study included only GPs who took part in the HAPPY AUDIT project and was qualitative. An assessment of antibiotic prescribing patterns for children with upper respiratory tract infections revealed that from the beginning, Lithuanian GPs who took part in the HAPPY AUDIT project prescribed fewer antibiotics than GPs of the same region who did not take part in this project [55]. As focus group discussions took part in the second year of the HAPPY AUDIT project, it is possible that project activities themselves, e.g. self-registration of antibiotic prescribing, the discussion of the antibiotic prescribing patterns in groups and educational activities, which aimed to change physicians' habits towards prudent prescribing of antimicrobial agents, might have influenced the study participants' views.

Another possible limitation of the study is related to the fact that the focus group facilitators were GPs. Although it is evident that the interaction of GPs with external researchers would have been different, we believe that homogeneity between participants and facilitators increased a sense of security and

favourably affected the discussions of GP strategies that did not correspond with consolidated guidelines.

In spite of the aforementioned limitations, this study, undertaken in Lithuania and the Russian Federation, indicates that in order to encourage evidence-based antibiotic use, both physicians *and* patients must be targeted.

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Competing interests

None declared

References

1. Grimsmo A, Hagman E, Faiko E, Matthiessen L, Njalsson T. Patients, diagnoses and processes in general practice in the Nordic countries. An attempt to make data from computerised medical records available for comparable statistics. *Scand J Prim Health Care* 2001, 19:76-82.

2. André M, Odenholt I, Schwan A, Axelsson I, Eriksson M, Hoffman M, et al. Upper respiratory tract infections in general practice: diagnosis, antibiotic prescribing, duration of symptoms and use of diagnostic tests. *Scand J Infect Dis* 2002, 34:880-886.

3. The bacterial challenge: time to react. ECDC/EMEA joint technical report. European Centre for Disease Prevention and Control, Stockholm, 2009. [http://www.ecdc.europa.eu/en/publications/Publications/0909_TER_The_Bacterial_Challenge_Time_to_React.pdf, cited 13 July 2010].

4. Welschen I, Kuyvenhoven MM, Hoes AW, Verheij TJ. Effectiveness of a multiple intervention to reduce antibiotic prescribing for respiratory tract symptoms in primary care: randomised controlled trial.*BMJ* 2004;329:431.

5. Llor C, Madurell J, Balagué-Corbella M, Gómez M, Cots JM. Impact on antibiotic prescription of rapid antigen detection testing in acute pharyngitis in adults: a randomised clinical trial. *Br J Gen Pract* 2011; 61:e244-51.

6. Gould IM, Mackenzie FM, Shepherd L. Use of the bacteriology laboratory to decrease general practitioners' antibiotic prescribing. *Eur J Gen Pract* 2007;13:13-5.

7. van Driel ML, Coenen S, Dirven K, Lobbestael J, Janssens I, Van Royen P, et al. What is the role of quality circles in strategies to optimise antibiotic prescribing? A pragmatic cluster-randomised controlled trial in primary care. *Qual Saf Health Care* 2007;16:197-202.

8. Francis NA, Butler CC, Hood K, Simpson S, Wood F, Nuttall J. Effect of using an interactive booklet about childhood respiratory tract infections in primary care consultations on reconsulting and antibiotic prescribing: a cluster randomised controlled trial. *BMC Fam Pract* 2008; 9:23.

9. Naughton C, Feely J, Bennett K. A RCT evaluating the effectiveness and cost-effectiveness of academic detailing versus postal prescribing feedback in changing GP antibiotic prescribing. *J Eval Clin Pract* 2009;15:807-812.

10. Parish PA: Sociology of prescribing. *Br Med Bull* 1974, 30:214-217.

11. Petursson P: GPs' reasons for "non-pharmacological" prescribing of antibiotics. A phenomenological study. *Scand J Prim Health Care* 2005, 23:120-125.

12. Björnsdóttir I, Hansen EH. Intentions, strategies and uncertainty inherent in antibiotic prescribing. *Eur J Gen Pract* 2002, 8:18-24.
13. Butler CC, Rollnick S, Pill R, Maggs-Rapport F, Stott N. Understanding the culture of prescribing: qualitative study of general practitioners' and patients' perceptions of antibiotics for sore throats. *BMJ* 1998, 317:637-642.
14. Altiner A, Knauf A, Moebes J, Sielk M, Wilm S. Acute cough: a qualitative analysis of how GPs manage the consultation when patients explicitly or implicitly expect antibiotic prescriptions. *Fam Pract* 2004, 21:500-506.
15. Altiner A, Brockmann S, Sielk M, Wilm S, Wegscheider K, Abholz HH. Reducing antibiotic prescriptions for acute cough by motivating GPs to change their attitudes to communication and empowering patients: a cluster-randomized intervention study. *J Antimicrob Chemother* 2007, 60:638-644.
16. Wilson AA, Crane LA, Barrett PH, Gonzales R. Public beliefs and use of antibiotics for acute respiratory illness. *J Gen Intern Med* 1999, 14:658-662.
17. Bagshaw SM, Kellner JD. Beliefs and behaviours of parents regarding antibiotic use by children. *Can J Infect Dis* 2001, 12:93-97.
18. Macfarlane J, Holmes W, Macfarlane R, Britten N. Influence of patients' expectations on antibiotic management of acute lower respiratory tract illness in general practice: questionnaire study. *BMJ* 1997, 315:1211-1214.
19. Welschen I, Kuyvenhoven M, Hoes A, Verheij T. Antibiotics for acute respiratory tract symptoms: patients' expectations, GPs' management and patient satisfaction. *Fam Pract* 2004, 21:234-237.
20. Tuckett D, Boulton M, Olson C, Williams A. *Meetings Between Experts.* London and New York: Tavistok Publications; 1985.
21. Netleton S. *The Sociology of Health and Illness.* 2nd edition. Cambridge: Polity Press; 2006.
22. Vanden Eng J, Marcus R, Hadler JL, Imhoff B, Vugia DJ, Cieslak PR, et al. Consumer attitudes and use of antibiotics. *Emerg Infect Dis* 2003, 9:1128-1135.

23. McNulty CA, Boyle P, Nichols T, Clappison P, Davey P. Don't wear me out: the public's knowledge of and attitudes to antibiotic use. *J Antimicrob Chemother* 2007, 59:727-738.

24. Butler CC, Kinnersley P, Prout H, Rollnick S, Edwards A, Elwyn G. Antibiotics and shared decision-making in primary care. *J Antimicrob Chemother* 2001, 48:435-440.

25. Goossens H, Ferech M, Vander Stichele R, Elseviers M. ESAC Project Group. Outpatient antibiotic use in Europe and association with resistance: a cross-national database study. *Lancet* 2005;365:579-87.

26. Butler CC, Hood K, Verheij T, Little P, Melbye H, Nuttall J, et al. Variation in antibiotic prescribing and its impact on recovery in patients with acute cough in primary care: prospective study in 13 countries. *BMJ* 2009;338:b2242.

27. Vlahovic-Palcevski V, Dumpis U, Mitt P, Gulbinovic J, Struwe J, Palcevski G, et al. Benchmarking antimicrobial drug use at university hospitals in five European countries. *Clin Microbiol Infect* 2007, 13:277-283.

28. Dumpis U, Gulbinovic J, Struwe J, Lagergren A, Griskevicius L, Bergman U. Differences in antibiotic prescribing in three university hospitals in the Baltic region revealed by a simple protocol for quality assessment of therapeutic indications. *Int J Clin Pharmacol Ther* 2007, 45:568-576.

29. Palcevski G, Ahel V, Vlahovic-Palcevski V, Ratchina S, Rosovic-Bazijanac V, Averchenkova L. Antibiotic use profile at paediatric clinics in two transitional countries. *Pharmacoepidemiol Drug Saf* 2004, 13:181-185.

30. Sanz E, Hernandez MA, Ratchina S, Stratchounsky L, Peire MA, Lapeyre-Mestre M, et al. Drug utilisation in outpatient children. A comparison among Tenerife, Valencia, and Barcelona (Spain), Toulouse (France), Sofia (Bulgaria), Bratislava (Slovakia) and Smolensk (Russia). *Eur J Clin Pharmacol* 2004, 60:127-134.

31. Balabanova Y, Fedorin I, Kuznetsov S, Graham C, Ruddy M, Atun R, et al. Antimicrobial prescribing patterns for respiratory diseases including tuberculosis in Russia: a possible role in drug resistance? *J Antimicrob Chemother* 2004, 54:673-679.

32. Galinyte D, Maciulaitis R, Budnikas V, Kubilius D, Varanaviciene B, Vitkauskiene A, et al. Analysis of antibiotic consumption and microorganism resistance changes (Antibiotiku vartojimo ir kai kuriu mikroorganizamu atsparumo pokyciu analize). *Medicina (Kaunas)* 2008, 44:751-767 (in Lithuanian).

33. Grigoryan L, Burgerhof JG, Degener JE, Deschepper R, Lundborg CS, Monnet DL, et al. Attitudes, beliefs and knowledge concerning antibiotic use and self-medication: a comparative European study. *Pharmacoepidemiol Drug Saf* 2007, 16:1234-1243.

34. Stratchounski LS, Andreeva IV, Ratchina SA, Galkin DV, Petrotchenkova NA, Demin AA, et al. The inventory of antibiotics in Russian home medicine cabinets. *Clin Infect Dis* 2003, 37:498-505.

35. Leonavicius V, Baltrusaityte G, Naujokaite I. *Sociology and the user of the health services*. The University of Vytautas Magnus, Kaunas, 2007 [in Lithuanian].

36. Bjerrum L, Munck A, Gahrn-Hansen B. Hansen MP, Jarboel D, Llor C et al: Health Alliance for Prudent Prescribing, Yield and Use of Antimicrobial Drugs in the Treatment of Respiratory Tract Infections (HAPPY AUDIT). *BMC Fam Pract* 2010, 11:29.

37. Rabiee F. Focus-group interview and data analysis. *Proceedings of the Nutrition Society* 2004, 63:655-660.

38. Thomas L, Mac Millan J, McColl E, Hale c, Bond S. Comparison of focus group and individual interview methodology in examining patient satisfaction with nursing care. *Social Sciences in Health* 1995, 1: 206-219.

39. Morgan DL. *The Focus Group Guidebook.* California: Sage Publications; 1998.

40. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology* 2006, 3:77-101.

41. Hawkings NJ, Butler CC, Wood F. Antibiotics in the community: a typology of user behaviours. *Patient Educ Couns* 2008, 73: 146-52.

42. Kavanagh KE, O'Shea E, Halloran R, Cantillon P, Murphy AW. A pilot study of the use of near-patient C-Reactive Protein testing in the treatment of adult respiratory tract infections in one Irish general practice. *BMC Fam Pract.* 2011;12:93.

43. Butler CC, Simpson S, Wood F. General practitioners' perceptions of introducing near-patient testing for common infections into routine primary care: a qualitative study. *Scand J Prim Health Care* 2008;26:17-21.

44. Horton R. *Second Opinion: Doctors, Diseases and Decisions in Modern Medicine*. London: Granta Books; 2003.

45. Stearns CR, Gonzales R, Camargo CA Jr, Maselli J, Metlay JP.Antibiotic prescriptions are associated with increased patient satisfaction with emergency department visits for acute respiratory tract infections. *Acad Emerg Med*. 2009;16:934-41.

46. Coulter A, Elwyn G. What do patients want from high-quality general practice and how do we involve them in improvement. *Br J Gen Pract* 2002, 52 Suppl: S22-6.

47. Avorn J, Solomon DH. Cultural and economic factors that (mis)shape antibiotic use: the nonpharmacologic basis of therapeutics. *Ann Intern Med* 2000, 133:128-135.

48. European Antibiotic Awareness Day 2010 [http://ecdc.europa.eu/en/EAAD, cited 7 June 2010].

49. Cals JW, Butler CC, Hopstaken RM, Hood K, Dinant GJ. Effect of point of care testing for C reactive protein and training in communication skills on antibiotic use in lower respiratory tract infections: cluster randomised trial. *BMJ* 2009; 338:b1374.

50. Tonkin-Crine S, Yardley L, Little P. Antibiotic prescribing for acute respiratory tract infections in primary care: a systematic review and meta-ethnography. *J Antimicrob Chemother* 2011; 66:2215-23.

51. Francis NA, Butler CC, Hood K, Simpson S, Wood F, Nuttall J. Effect of using an interactive booklet about childhood respiratory tract infections in primary care consultations on reconsulting and antibiotic prescribing: a cluster randomised controlled trial. BMJ 2009;339:b2885.

52. Spurling GK, Del Mar CB, Dooley L, Foxlee R. Delayed antibiotics for respiratory infections. *Cochrane Database Syst Rev* 2007, (3):CD004417.

53. Hoye S, Frich JC, Lidbaek. Delayed prescribing for upper respiratory tract infections: a qualitative study of GP's experiences. *Brit J Gen Pract* 2010, 60:907-12.

54. Moore M, Little P, Rumsby K, Kelly J, Watson L, Warner G, et al. Effect of antibiotic prescribing strategies and an information leaflet on longer-term reconsultation for acute lower respiratory tract infection. *Br J Gen Pract.* 2009, 59:728-34.

55. Jurgutis A, Martinkenas A, Radzeviciene R, Bumblys A, Jaruseviciene L, Bjerrum L. Patterns of prescription of antibiotics for children respiratory infections among primary health care physicians of Klaipeda region. 17th Nordic Congress of General Practice. Tromso, Norway, 14-17June, 2011.