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MANAGEMENT OF RESPIRATORY TRACT INFECTIONS IN PRIMARY CARE IN POLAND - RESULTS OF THE HAPPY AUDIT 2 PROJECT

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ABSTRACT

OBJECTIVE. The Polish results of the international Happy Audit 2 project are reported which objective was to present therapeutic decisions made by general practitioners (especially antibiotics prescribed) and diagnostic methods applied to patients with respiratory tract infections (RTI).

MATERIAL AND METHODS. Following each visit of patient with respiratory tract infection, general practitioners participating in the study completed the questionnaire. The questionnaire included patient's data (age, gender), the duration of disease, clinical symptoms, diagnosis, prescribed antibiotics, additional testing as well as the influence of various factors on therapeutic decision.

RESULTS. Having considered the results of Happy Audit in Poland, a total of 5,137 office visits of patients reporting symptoms of RTIs were analyzed. The average duration of symptoms before visiting GP was 4.8 days (compared to average 4.4 in other countries). Worth noting is that additional testing in diagnosis of RTIs was performed less frequently in Poland: rapid streptococcal test was conducted in 0.4% of cases (European average: 4.45%), CRP - in 2.2% of patients (average from other countries: 14.2 %) and chest X-ray in 2.3% of cases compared to 14% in other project's participants. In Poland, the most frequently applied antibiotic was amoxicillin, which was used in 28.9% of cases ended with antibiotic prescribing (amoxicillin/ pivampicillin were also predominant in other countries, excluding Sweden). In Poland, macrolides (22.4% of all prescriptions for antibiotic) and cephalosporins (12.1%) were frequently used. The results indicate that narrow-spectrum antibiotics are prescribed in Poland less frequently, with the example being penicillin V which was prescribed in 6.7% of patients with RTIs who were given antibiotic.

CONCLUSIONS. Comparing the results of Happy Audit 2 in Poland and other project's participants, the major differences consist in rare use of phenoxymethylpenicillin in favour of amoxicillin and macrolides as well as infrequent use of additional testing in diagnosis of RTIs in Poland.

Key words: *antibiotics, respiratory tract infections, general practitioners.*

INTRODUCTION

Respiratory tract infections (RTIs) are one of the leading cause of general practitioner (GP) office visits. Furthermore, these infections constitute the most common reason for prescribing antibiotics in primary care (1).

Various respiratory tract infections differ with regard to the aetiological agent, however, the majority of pharyngitis, laryngitis, rhinitis, bronchitis are of viral aetiology, e.g. bronchitis is attributed to viruses in 95% (2). Thus, the application of antibiotics in the prevailing number of GP office visits due to the respiratory tract infections is not required. In the present time when the acceleration of antibiotic resistance is observed, the administration of antibiotics should be restricted exclusively to bacterial infections (3). Both, the excessive administration of antibiotics and overuse of broad-spectrum antibiotics contribute to further increase of antimicrobial resistance (4). From the studies transpires that the decision on antibiotic therapy and type of antibiotic may be sometimes dependent on doctor's prescribing behaviour ('high-prescribers' and 'low-prescribers') (5, 6), local attachment to several antibiotics or being under the pressure of patient who expects to undergo antibiotic therapy (7, 8) as well as many other non-medical factors.

Furthermore, the comparison of antibiotic use suggests considerable differences among the countries while the prevalence of bacterial infections is very similar (9). The concerns raised by the spread of antimicrobial resistance and overuse of antibiotics in primary care induced the necessity to undertake appropriate actions (10). Recently, many countries have initiated the interventions with the objective to modify the management of respiratory tract infections by GPs, especially consisting in reducing the antibiotic prescribing rate and altering the profile of prescribed antibiotics in favour of narrow-spectrum antibiotics, being pursuant to the indications for antibiotic therapy in respiratory tract infections (11, 12). The objectives of the study are to present the diagnostic and therapeutical decisions made by general practitioners in Poland with regard to patients reporting respiratory tract infections and compare the patient management in Poland and other countries participating in the project.

MATERIAL AND METHODS

Happy Audit 2 was a multi-center, international study which was conducted in November and December 2012. The study was inspired by the results of Happy Audit (Heath Alliance for Prudent Prescribing, Yield and Use of Antimicrobial Drugs in the Treatment of Respiratory Tract Infection) which was funded by the European Union. The Project was conducted in the years 2007-2010. Its objective was to modify the antibiotic prescribing habits of general practitioners with regard to respiratory tract infections.

Happy Audit 2 was initiated by the physicians representing BARN group (Baltic Antibiotic Resistance Network), whose aim is to counteract the spread of antibiotic resistance. The participants of Happy Audit 2 were three countries involved in the previous edition of the project, i.e.: Lithuania, Russia (Kaliningrad Oblast) and southern Sweden and new participants – Latvia and Poland.

The training centres for general practitioners in the following cities: Białystok, Bydgoszcz, Gdańsk, Kraków, Lublin, Olsztyn, Poznań, Szczecin, Wrocław and Zielona Góra offered general practitioners and physicians completing their specialization in family medicine to participate in the Polish edition of the project. The physicians participated in the project on a voluntary basis.

In November 2012, the participants of the project within three weeks were registering all GP office visits of patients who reported the symptoms of respiratory tract infection. Following the visit, the physician completed Happy Audit 2 questionnaire, including information on patient's demographic data (age and gender), disease duration, clinical symptoms, additional testing performed, probable aetiology, type of prescribed antibiotic, patient's attempt to influence the physician to prescribe the antibiotic, if applicable, and further patient's management, e.g. referral to hospital.

Happy Audit 2 questionnaires from the first registration, i.e. November and December 2012 were summarized in reports regarding particular countries and the project as a whole.

The Bioethics Committee of Medical University of Białystok approved the study.

RESULTS

In Poland, 89 physicians participated in the study. Overall, they registered 5,137 office visits of patients with respiratory tract infections. The average age of Polish patients, enrolled into Happy Audit 2, was 27 years.

Having analyzed all countries, a total of 13,106 GP office visits of patients of different age were registered (average age: 24.4). Table I presents detailed characteristics of patients participating in Happy Audit 2 in Poland compared to patients from other countries.

prescribed in 37% of consultations. Correspondingly, a few percent of patients with suspected bacterial aetiology have not been prescribed antibiotics.

Worth mentioning is that in Poland additional testing in diagnosis of RTIs is rarely performed with the examples being rapid streptococcal test, which was conducted in 0.4% of cases (European average: 4.45%), CRP - in 2.2% of patients (average from other countries: 14.2 %) and chest X-ray in 2.3% of cases compared to 14% in other project's participants (Table II). Additional testing was not performed in 88.6 % of Polish patients.

Table I. Characteristics of Polish patients with RTIs compared to patients from other countries participating in Happy Audit 2

Age in years	Number of patients (N=13,106)					
	Poland N= 5137	Lithuania N=2604	Latvia N=3414	Kaliningrad Oblast N=1652	Sweden N=299	All countries N=13106
< 18	2276 (44.3%)	1545 (59.3%)	1991 (58.3%)	705 (42.7%)	113 (37.8%)	6630 (50.6%)
18- 49	1836 (35.7%)	758 (29.15%)	991 (29%)	676 (40.9%)	104 (34.8%)	4365 (33.3%)
> 50	1022 (19.9%)	300 (11.5%)	431 (12.6%)	267 (16.2%)	80 (26.8%)	2100 (16%)
Male	2262 (44%)	1193 (46%)	1561 (46%)	750 (45%)	100 (33%)	5871 (45%)
Female	2853 (56%)	1406 (54%)	1828 (54%)	889 (54%)	196 (66%)	7172 (55%)

Due to missing data, the percentages in particular questionnaires cannot be summarized up to 100%.

Both, in Poland and other countries, the minimum duration of symptoms was 0 days with the reason being that some patients visited the physician at the day of symptom occurrence (especially frequently in Kaliningrad Oblast), while in Poland the maximum duration of symptoms was 60 days. As many as 30.2% and 33.8 % of Polish patients visited the physician within the first two days and more than five days of respiratory tract infection symptom duration, respectively (Fig. 1).

In Poland as well as other countries, cough and rhinorrhoea (75.7% vs 78.9%) were predominantly reported. The GPs from Poland and other countries suggested probable viral aetiology in 58.2% and 64.1% of cases, respectively. In Poland, however, antibiotic was

Amoxicillin was antibiotic, which was the most frequently prescribed by Polish GPs. It was indicated in 28.9% of all consultations in which the antibiotic was prescribed. Amoxicillin with clavulanic acid were also commonly prescribed, i.e. 24.4% of cases (amoxicillin/pivampicillin were also predominant in other countries, excluding Sweden). In Poland, macrolides (22.4% of all prescriptions for antibiotic) and cephalosporins (12.1%) are frequently applied. Worth noting is that in Poland the narrow-spectrum antibiotics, e.g. penicillin V are rarely used (only 6.7% of all prescribed antibiotics) while in Sweden it is a predominant antibiotic, prescribed in more than 70% of all consultations in which the antibiotic therapy was determined (Fig. 2).

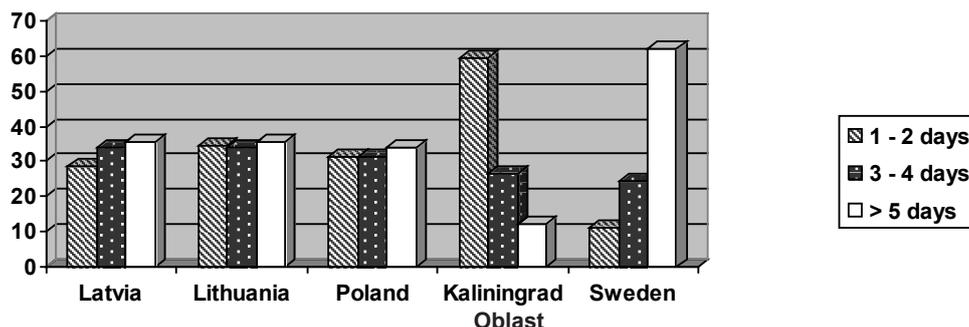
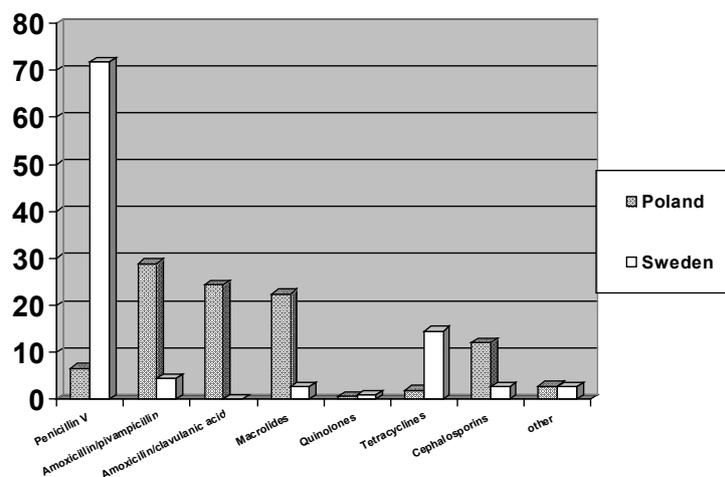


Fig. 1. Duration of symptoms prior to visiting the GP in different countries

Table II. Frequency of additional testing in respiratory tract infections - Poland compared to other Happy Audit 2 participants

Additional testing	Number of patients N (%)					
	Poland N=5137	Lithuania N=2604	Latvia N=3414	Kaliningrad Oblast N=1652	Sweden N=299	All countries N=13106
Rapid streptococcal testing	21 (0.4%)	54 (2%)	174 (5%)	27 (1.6%)	82 (27.5%)	358 (2.7%)
CRP	111 (2.2%)	924 (35.5%)	277 (8.1%)	15 (0.9%)	136 (45.5%)	1463 (11.2%)
Chest X-ray	119 (2.3%)	280 (10.8%)	509 (14.9%)	290 (17.6%)	1 (0.3%)	1199 (9.2%)
None of the above	4553 (88.6%)	1328 (51.0%)	2314 (67.8%)	1293 (78.3%)	80 (26.8%)	9568 (73%)
Missing	354 (6.9%)	198 (7.6%)	266 (7.8%)	45 (2.7%)	28 (9.4%)	891 (6.8%)



Percentage of different kinds of antibiotics prescribed by GPs in Poland and Sweden in Happy Audit 2 (total number of prescribed antibiotics in each country constitutes 100 %)

Fig. 2. Frequency of prescription of different kinds of antibiotics in Poland and Sweden in Happy Audit 2.

DISCUSSION

Happy Audit 2 has confirmed significant discrepancies in diagnostic procedures and treatment of RTIs in particular countries. Irrespective of the fact that the percentage of patients who were prescribed the antibiotic was comparable (less than 40% in all countries), worth noting are the differences among the patients in several countries. In Poland, the average duration of disease was 4.8 days while in Sweden it amounted to 10.4 days. It suggests that patients in Poland visit the GP earlier and probably have symptoms of milder nature. The Polish profile of visiting the GP is similar to the one observed in Latvia and Lithuania, i.e. more than 60% (62.5%) of patients will visit the GP within the first four days. Firstly, it suggests good access to GP. Secondly, it implies that patients are not well-educated regarding self-limiting course of majority of infections and their viral aetiology. Probably, the necessity of obtaining the sick leave is also of crucial role while for example in Sweden GP confirmation is not required for

the 7-days-sick leave. In Kaliningrad Oblat, patients visit GP even earlier, i.e. as many as 59.3% of them seek medical advice within the first two days of disease while in Sweden the majority of patients (62.2%) visit GP after five days and more of the disease occurrence. It may be concluded that the possibility of consulting well-qualified nurse via telephone and education of society prevent from many unnecessary and too early GP office visits by patients with respiratory tract infections.

Comparing to the previous years, the project's results indicate that GPs prescribe antibiotics in RTIs on a more rare basis. The antibiotic was prescribed in fewer than 40 consultations while the study conducted in north-eastern Poland in 2003 indicated that antibiotic prescribing rate amounted to ca 60% (13). It may be concluded that tendency consisting in more economic antibiotic prescribing is associated with popularization of educational campaigns on RTIs management recommendations among physicians and education of GPs on viral aetiology and self-limiting course of the majority of RTIs (14). Given the methodological limitations of study (non-random selection of physicians, results based

on questionnaires completed by physicians), such a conclusion should be formulated cautiously. Other studies of Panasiuk et al. (15) based on analysis of medical records of patients in Lubelskie voivodeship suggest that this percentage may amount to 90%.

In Poland, almost all decisions on antibiotic prescribing were of empirical nature, without performing additional testing which were ordered only in ca 5% of cases, being the lowest value among all countries participating in the project. The rapid streptococcal test and CRP were performed by Polish GPs in 0.4% (compared to 27.5% in Sweden) and 2.2% of consultations, respectively.

Probably, it may result from the fact that Polish GP is to bear the costs of additional testing in terms of 'per capita rate'. Furthermore, rapid streptococcal test is not included in the list of tests performed by GP (in Latvia, rapid streptococcal test is funded from public resources). As in the case of earlier studies (16), Sweden is a leader in performing additional testing - diagnostic test was applied in 73.2% of Swedish patients participating in Happy Audit 2, CRP and rapid streptococcal test were the most frequently performed (27.5% of consultations). The reasons for frequent use of additional testing by Swedish GPs may be that patients and some physicians do not bear its costs – in the latter it is dependent on the form of contract for health care services provision. The common use of rapid streptococcal test in the diagnostic procedures of pharyngitis enables rapid determining of diagnosis, reduces the frequency of antibiotic prescribing in pharyngitis of viral aetiology and favours more frequent application of penicillin V, being antibiotic of narrow-spectrum, to which *Streptococcus pyogenes* is susceptible (17). Among the negative aspects of excessive use of rapid streptococcal test are high cost, insufficient sensitivity of these tests, possibility of prescribing antibiotics to *Streptococcus* carriers with symptoms of viral infection.

According to some studies, CRP performing in primary care decreases the frequency of antibiotic prescribing (18, 19). In Happy Audit 2, however, it was not concluded that use of additional testing directly contributed to decrease of antibiotic prescribing rates in respiratory tract infections. For instance, the antibiotic prescribing rate was similar in Latvia and Poland despite the higher rate of additional testing in the former.

The higher frequency of phenoxymethylpenicillin use is typical of Swedish antibiotic prescribing profile (20). Irrespective of national recommendations in which phenoxymethylpenicillin is a drug of first line in bacterial pharyngitis, in Poland broad-spectrum antibiotic, i.e. amoxicillin and amoxicillin with clavulanic acid are predominantly applied (21). The frequent prescription of amoxicillin and amoxicillin with clavulanic acid as the first-line drug in pharyngitis may

result from physician's uncertainty to diagnosis, which is associated with rare performing of additional testing, lack of knowledge on aetiological agents of pharyngitis, habits, pharmaceutical companies impact and low cost of drug (in the case of amoxicillin). Other countries, e.g. the USA also experience similar problem of broad-spectrum antibiotic prescribing in pharyngitis (22, 23). Furthermore, Polish participants of study informed that phenoxymethylpenicillin is not always available in chemist's, which may hinder its application. Irrespective of the fact that amoxicillin is effective against *Streptococcus pyogenes*, it is not recommended to be used as first-line drug in the treatment of bacterial pharyngitis as it may increase the bacterial colonization of respiratory tract with *H. influenzae* and *M. catarrhalis*, producing β -lactamases (13). Regardless of the above, if the diagnosis is uncertain, amoxicillin and amoxicillin with clavulanic acid remain the antibiotics which are preferred by physicians in Poland. Probably, this is due to the fact that they are active against the majority of bacterial agents causing RTIs (24). Worth noting is high rate of macrolides and cephalosporins prescribing instead of recommended penicillin. It may be affected by physicians attachment to these antibiotics and lack of knowledge on antibiotic therapy recommendations in respiratory tract infections.

CONCLUSIONS

In Poland, high percentage of patients with RTIs visit GP quite early (more than 30% at 1-2 day of disease duration). Comparing the results of Happy Audit 2 in Poland and other project's participants, the major differences consist in rare use of phenoxymethylpenicillin in favour of amoxicillin, macrolides and cephalosporins as well as infrequent use of additional testing in diagnosis of RTIs in Poland.

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Received: 30.12.2013

Accepted for publication: 17.01.2014

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