
GENERAL

**KNOWLEDGE, ATTITUDE AND PERCEPTION REGARDING ANTIBIOTICS
AMONG POLISH PATIENTS**MARIOLA DROZD^{1*}, KAZIMIERZ DROZD², RAFAŁ FILIP³ and AGNIESZKA BYŚ⁴¹ Department of Applied Pharmacy, Medical University of Lublin, 1 Chodźki St., 20-093 Lublin, Poland² Department of Material Engineering, University of Technology in Lublin, Poland³ Department of Endoscopic Clinical Research, Institute of Rural Health in Lublin, Poland⁴ Pharmacy “Curate”, Kraśnik, Poland

Abstract: Antibiotics are drugs often used. This drugs used without legitimate indications or incorrectly may cause not satisfactory clinical results. It is therefore important for the society members to be aware of what is an antibiotic and which benefits and risks its use may bring. The survey was conducted in 2010. Objective of the study was to obtain information on the current knowledge and beliefs about antibiotic therapy of Poles. The research material consisted of 609 questionnaires and interviews, conducted among the adult population residing in the Lublin voivodeship. The study shows that rural inhabitants don't know the term herbal medicine or antibiotic more often than inhabitants in the city. Similarly, they more often don't know the action of antibiotics as well as use them less frequently. Poles treat them as an emergency exit if they are not helped by home treatments. There was a problem of overuse of antibiotics, related to young people, which were busy and have no time for illness. Self-medication in the antibiotic therapy also occurs and is caused, among others, by undisciplined patients. The respondents admitted that they have antibiotics from the previous treatment, from pharmacy, or from family or friends. However, residents of rural areas using an antibiotic most frequently, cited a pharmacy as the source of this drug. Other issues dealt within this study generally doesn't differ for rural inhabitants from the data obtained among the urban population.

Keywords: antibiotics use, antibiotics and knowledge, opinions of patients

According to the analysis of the use of drugs in the European countries, Poland occupies the fifth position with respect to the consumption of antibiotics. The studies show that the use of drugs from this group constantly increases. An overuse and irrational administration of antibiotics creates the risk of occurrence of bacterial mutations, which lead to the development of their resistance to antibiotics. Among other things, this is the reason why Polish physicians increasingly more often find themselves in situations in which they have no remedies to treat patients with severe infections (1). An increase in resistance to antibiotics creates the threat of an increase in mortality rate due to, e.g., pneumonia. The World Health Organization estimates that annually more than 15 million people worldwide die due to infectious diseases (2). However, it should be also mentioned that antibiotics have saved many human lives. Antibiotics are drugs very frequently used without justified indications, or inappropriately,

therefore producing unsatisfactory clinical effects (3). While considering errors committed during pharmacotherapy they may be divided as follows: malpractice and medical, associated with the production and storage of drugs as well as committed by a patient resulting from the lack of observance of doctor's orders (4). For this reason, knowledge and awareness concerning antibiotic therapy in the society is important.

Objective

Considering the occurrence on the pharmaceutical market antibiotics with a wide spectrum of action and risks related with their overuse, the awareness of society is important concerning what are antibiotics and what are benefits and threats associated with their use. In 2010, a study was conducted aimed at obtaining information concerning the current knowledge, attitude and perception of antibiotic therapy by Poles. The objective of the

* Corresponding author: e-mail: mariola.drozd@umlub.pl

study was to determine in what way patients understand this kind of therapy and what is an antibiotic in the context of a drug of natural origin, how do patients behave while administering antibiotics to themselves and their children? An additional goal was the highlighting of situations in which patients use antibiotics and the frequency of use of antibiotics, compared to natural methods of treatment.

MATERIALS AND METHODS

The study material consisted of data obtained from a survey conducted among the adult population living in the Lublin Region. The study was performed among patients of randomly selected hospitals and health centers. Selection of patients required the expression of oral consent for the conversation. The questionnaire was validated on the 10 people team, which are not included in the analysis results. The study was carried out in July and August 2010 in the form of an individual conversation with each patient. Six hundred and nine (609) questionnaire forms were collected. The author's questionnaire contained 16 open items, which accounted for assistance during the interview. All interviews were used for analysis. The data were analyzed statistically.

RESULTS

The study involved 609 respondents aged between 18 to 85 years, including 412 women and 197 men. Four hundred and six (406) respondents lived in rural areas, while from urban area were 203

persons. A university degree had 89 people, secondary education – 233 persons, elementary vocational education – 160 persons and elementary education – 124 respondents. Characteristics of respondents is shown in Figure 1.

While provided a reply to the question: “What do you understand by the term drug of natural origin?”, the patients expressed themselves in their own words using several notions. Frequently, one patient used 2 or even 3 notions to explain how he/she understood this term.

Analyzing the answers, it was observed that most people answered that these are herbs or drug manufactured based on herbs, which accounted for 44.7% of the respondents. During an interview, some patients considered these drugs as without chemical substances, which accounted for approximately 8.7% of the responses. Three percent of patients surveyed, considered the natural origin drug as more effective, and approximately 3.2% of people said that such drug is safer. A number of respondents (22.2%) declared no sufficient knowledge to answer this question. It should be emphasized that in spite of so accurate answers which gave patients, until 133 people have said that they don't know, what is the drug of natural origin.

Analyzing the responses to the question “What do you understand by the term antibiotic” it was observed that most often response granted (22% respondents) was that the antibiotic is a chemical drug. Surprising is that 19.3% of respondents don't know what is an antibiotic. Table 2 presents the replies to this question.

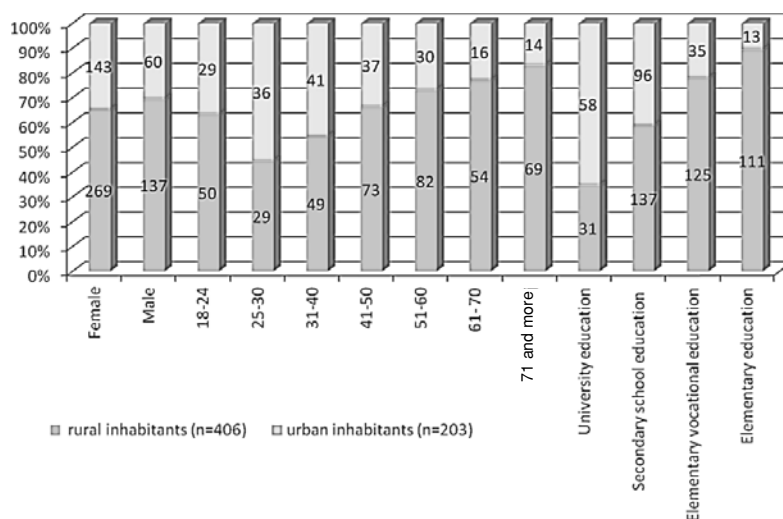


Figure 1. Characteristics of respondents

Table 1. Meaning of the term „natural drug” according to respondents. (the respondents could answer many descriptions).

Patients' responses	Number and percentage of responses provided by rural inhabitants		Number and percentage of responses provided by urban inhabitants		Total number and percentage of responses	
	n = 406	%	n = 203	%	n = 609	%
Herbs	173	42.6	95	46.8	268	44.0
Medicine from natural substances	103	25.4	83	40.9	186	30.5
All herbal drugs	114	28.1	66	32.5	180	29.6
Plants	46	11.3	59	29.1	105	17.2
Without chemicals	32	7.9	20	9.9	52	8.5
Safer	10	2.5	9	4.4	19	3.1
More effective	13	3.2	5	2.5	18	3.0
Of animal origin	7	1.7	4	2.0	11	1.8
Ecological	2	0.5	4	2.0	6	1.0
Produces fewer side effects	0	0.0	4	2.0	4	0.7
Homeopathy	3	0.7	0	0.0	3	0.5
Vitamins	1	0.2	0	0.0	1	0.2
I do not know	119	29.3	14	6.9	133	21.8

The objective of the study was to discover how patients understand the action of antibiotics. Table 3 presents the compilation of answers.

Based on the analysis of the responses contained in Table 3, it was found that 63% of respondents indicated that antibiotic kills bacteria, 13% of the patients said that the antibiotic has a preventive effect and 11.2% of the declared research group answered that antibiotic treatment immunizes the organism, whereas 19.8% of people didn't know the target of the antibiotic.

The subsequent question: "Are antibiotics necessary for the treatment of infection?" was aimed at becoming familiar with the opinion concerning the use of antibiotics and attract attention to the phenomenon of overuse of these drugs. Analysis of this question showed that 43 urban and 86 rural inhabitants provided a positive answer to this question; 156 urban and 308 rural inhabitants considered that antibiotics are not necessary in the treatment of infection, while 4 and 11 respondents, respectively, did not know the answer to this question.

The question: "Do you use antibiotics?" was aimed at verification of the number of patients who reach for these drugs. This question also qualified for answering the subsequent questions. Analysis of responses indicated that 509 (98.3%) patients admit-

ted that they used an antibiotic if such a need arose. Only 10 patients reported that they did not apply antibiotics and these were respondents aged over 61, also these patients informed about the fact of using herbs in the case of infection.

The study also investigated the expectations of patients reporting to a physician with complaints such as: runny nose, cough and sore throat. Analysis of the replies to this problem showed that 92.9% of patients did not expect a prescription for an antibiotic. Table 6 presents detailed data.

The subsequent question concerned the situation when, despite a different opinion of a patient, the physician does not recommend antibiotic therapy. Here, as many as 92.2% of respondents replied that they agreed with the doctor's decision and took other drugs ordered by the physician, whereas 6.5% of respondents mentioned that they were not satisfied with such a decision, but if the therapy proposed would be ineffective, they would come back to the doctor several days later and ask again for an antibiotic. Only 1.3% of respondents expressed an opinion that in such a situation they would visit another doctor to obtain a prescription for an antibiotic (Table 5).

In the study, a question was also asked concerning home methods of treatment, so-called, self-

Table 2. Meaning of the term „antibiotic” according to respondents (the respondents could answer many descriptions).

Patients' responses	Number and percentage of responses provided by rural inhabitants		Number and percentage of responses provided by urban inhabitants		Total number and percentage of responses	
	n = 406	%	n = 203	%	n = 609	%
Chemical drug	69	17.0	63	31.0	132	65.0
Drug which will act if herbs have not	57	14.0	27	13.3	84	41.4
Effective drug / good	49	12.1	23	11.3	72	35.5
Strong drug	40	9.9	27	13.3	67	33.0
Drug on prescription which cures	47	11.6	19	9.4	66	32.5
Antibacterial drug	32	7.9	34	16.7	66	32.5
Synthetic drug	17	4.2	12	5.9	29	14.3
Drug applied as a last resort	13	3.2	11	5.4	24	11.8
Pills or injection	18	4.4	5	2.5	23	11.3
Fast-acting drug	20	4.9	3	1.5	23	11.3
Anti-inflammatory drug	12	3.0	4	2.0	16	7.9
Anti-viral drug	4	1.0	8	3.9	12	5.9
Complex drug	5	1.2	5	2.5	10	4.9
Drug against pathogenic microbes	7	1.7	3	1.5	10	4.9
Non-natural drug	7	1.7	2	1.0	9	4.4
Drug weakening the organism	5	1.2	3	1.5	8	3.9
Antifungal drug	3	0.7	5	2.5	8	3.9
General effect drug, I am afraid of this drug	3	0.7	5	2.5	8	3.9
Poison	5	1.2	2	1.0	7	3.4
New bacteria for the organisms which the organism cannot produce itself	4	1.0	1	0.5	5	2.5
Antipyretic drug	2	0.5	2	1.0	4	2.0
Preventive drug	3	0.7	1	0.5	4	2.0
All-purpose medicine	1	0.2	2	1.0	3	1.5
Warming-up drug	1	0.2	1	0.5	2	1.0
Vaccine	1	0.2	1	0.5	2	1.0
Analgesic drug	1	0.2	0	0.0	1	0.5
Special drug	0	0.0	1	0.5	1	0.5
Drug stimulating the organism	1	0.2	0	0.0	1	0.5
I do not know	97	23.9	19	9.4	116	57.1

Table 3. Action of antibiotics (the respondents could answer many descriptions).

Patients' responses	Number and percentage of responses provided by rural inhabitants		Number and percentage of responses provided by urban inhabitants		Total number and percentage of responses		No. of respondents of taking antibiotics without consulting a doctor n = 62
	n = 406	%	n = 203	%	n = 609	%	
Kills bacteria	224	55.2	154	75.9	154	75.9	47
Kills viruses	0	0.0	1	0.5	1	0.5	0
Preventive action	55	13.5	23	11.3	78	38.4	14
Treatment with an antibiotic immunizes the organism	52	12.8	15	7.4	67	33.0	8
Weakens the organism	1	0.2	1	0.5	2	1.0	0
Produces undesirable effects	4	1.0	5	2.5	9	4.4	0
I do not know	94	23.2	25	12.3	119	58.6	3

medication, before a visit to a physician, and the recommendation to use an antibiotic. Analysis showed that 538 respondents took an antibiotic only and exclusively when prescribed by a doctor. The remaining 73 respondents admitted that they use an antibiotic without consulting a physician. The source of possessing an antibiotic was of interest (Table 6).

Based on the responses obtained, as many as 89.7% of respondents admitted that they applied an antibiotic only when prescribed by a doctor. However, 10.3% of patients mentioned that they took an antibiotic without consulting a doctor. When asked where they had obtained an antibiotic, 5.5% of these patients reported that they possessed these drugs from previous treatments, 8.2% from a pharmacy, whereas 4% from family and acquaintances. Among patients who applied self-medication, as many as 44 respondents, i.e., 7.3%, obtained an antibiotic from several sources, hence, inequality in the percentage between the sum of patients who possessed an antibiotic from previous treatment, from a pharmacy, and from family/acquaintances, and the total percentage of patients who applied self-medication. Among rural inhabitants, the most frequently provided reply was that they always had a reserve, while urban inhabitants replied that they liked to have an antibiotic at home, which made them feel safe.

While asking the respondents: "Do you seek for natural methods of treatment to avoid an antibiotic?" as many as 466 per 608 respondents (which is 76.6%) mentioned that they always apply home methods of treatment before they reach for an antibiotic. Nevertheless, 15.1% of patients reported that an antibiotic is a proven method of treatment and they did not look for other methods, and 7.6% of respondents indicated that in taking an antibiotic they felt safe, because they were convinced that this drug would help them. Only 4 (0.7%) respondents did not use antibiotics, because they considered that natural medications are a better alternative (Table 7).

To the subsequent question "Do you use home methods of treatment before you reach for an antibiotic?" 20.2% of respondents replied that they did not use these methods, whereas the remainder - 79.8% reported that they applied home treatment. While providing a reply to this question, the respondents did not specify what type of medication they used. The largest number of respondents - as many as 70.3% - indicated that they consumed garlic or onion for infection, 66.8% consumed milk with honey, 65.8% drank herb teas, and 59.8% applied suction cups therapy.

Table 4. Frequency of using antibiotics.

Patients' responses	Number and percentage of responses provided by rural inhabitants n = 402 (%)	Number and percentage of responses provided by urban inhabitants n = 197 (%)	Total number and percentage of responses n = 599 (%)
More rarely than once a year	211 (52.5%)	73 (37.1%)	284 (47.4%)
Once a year	107 (26.6%)	69 (35.0%)	176 (29.4%)
Once in half a year	62 (15.4%)	41 (20.8%)	103 (17.2%)
Once in 2-3 months	19 (4.7%)	13 (6.6%)	32 (5.3%)
More frequently than once in 2 months	3 (0.7%)	1 (0.5%)	4 (0.7%)

Table 5. Respondents' reaction to refusal for a prescription for an antibiotic.

Patients' responses	Number and percentage of responses provided by rural inhabitants n = 402 (%)	Number and percentage of responses provided by urban inhabitants n = 202 (%)	Total number and percentage of responses n = 604 (%)
I agree and take drugs recommended by the doctor	376 (93.5%)	181 (89.6%)	557 (92.2%)
I do not like the doctor's decision, if the therapy will be ineffective I will come back several days later	21 (5.2%)	18 (8.9%)	39 (6.5%)
I will visit another doctor who will prescribe an antibiotic	5 (1.2%)	3 (1.5%)	8 (1.3%)

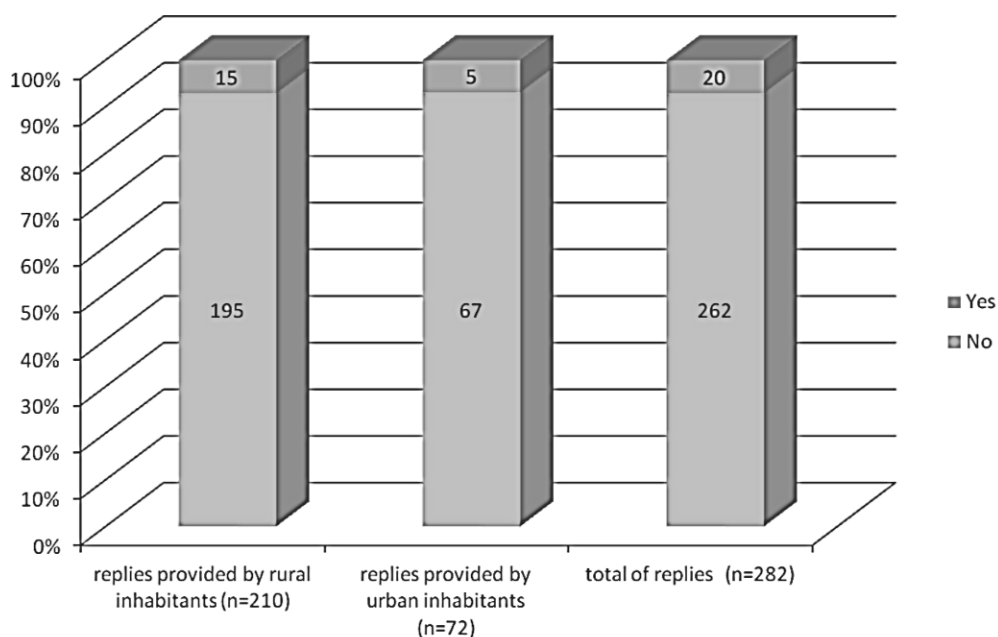


Figure 2. Expectation of giving a prescription for antibiotic in the case of complaints such as runny nose, cough, sore throat

Table 6. Source of possessing an antibiotic.

Patients' responses	Number and percentage of responses provided by rural inhabitants n = 66 (%)	Number and percentage of responses provided by urban inhabitants n = 69 (%)	Total number and percentage of responses n = 135 (%)
From family/acquaintances	17 (25.8%)	39 (56.5%)	56 (41.5%)
From pharmacy	34 (51.5%)	15 (21.7%)	49 (36.3%)
Antibiotic left after former therapy	13 (19.7%)	11 (15.9%)	24 (17.8%)
Other	2 (3.0%)	4 (5.8%)	6 (4.4%)

DISCUSSION

The presented experiment, as well as previously conducted studies, showed that the respondents found it more difficult to specify what they understood by the term “a drug of natural origin” or “an antibiotic”. In the first case, as many as 22.2% of respondents admitted they could not provide an answer to this question, while concerning the term “an antibiotic” – 19.3%. While analyzing the regularities in replies to question 1, approximately 70% of respondents provided the correct reply, considering that this is a medication of a plant origin, based on herbs and without harmful chemical substances; 1.8% of respondents mentioned that these are also drugs of animal origin. To the question: “What do you understand by the term an antibiotic?”, 33% of patients replied that this is a chemical, synthetic, non-natural drug of an anti-inflammatory or antifungal action. This confirms that the obtaining of an answer to this type of question is consistent with the definition of an antibiotic (5). Approximately 40% of respondents described an antibiotic as a drug which should be applied in the case of infection, because it is good, effective, and fast acting, albeit a very strong medication; and drugs of plant origin are insufficient; 4% of patients described an antibiotic as a medication applied if all else fails. Such an attitude by respondents towards antibiotics is correct, because patients do not try to pressure a physician for an antibiotic and do not apply self-medication, which contributes to a decrease in the phenomenon of bacterial resistance (6).

The respondents' replies concerning the action of antibiotics were interesting. According to 63% of them, antibiotics have a bactericidal effect; however, while providing the reply no respondent in the study considered the bacteriostatic action of an antibiotic. As many as 13% of patients considered an antibiotic as a drug preventing infection, which evidences an inadequate perception of action of this type of drug. Also, 11.2% of patients reported that

an antibiotic is a drug which improves the resistance of an organism and protects it against infections. Following the line of thought of patients who considered an antibiotic as a preventive drug or a drug improving immunity, it may be presumed that these individuals will abuse antibiotics in various ways. Such a perception of an antibiotic by patients leads to errors during antibiotic therapy, for which the responsibility lies not only with the physician or medical staff, but primarily with the patients themselves by, e.g., shortening the period of taking an antibiotic or self-medication.

As many as 19.8% of respondents had no knowledge of the action of an antibiotic, and 90% of them were rural inhabitants aged 61 and over. In addition, the respondents reported that they did not possess knowledge of this problem, because for them the highest authority is the physician who always knows best. On the one hand, this fact may indicate a phenomenon of paternalism in medicine, which is widely negated, but on the other hand, it may present an implicit trust in a physician, and belief in the observance by a physician of the principles of medical practice, which in the case of antibiotic therapy have been described in detail in the literature (7).

The respondents' replies are noteworthy concerning the question “Are antibiotics necessary in the treatment of infection?”. As many as 76% of respondents considered that antibiotics are not necessary, and 50% of them indicated that they are afraid of antibiotics, which constituted 38% of replies of all the respondents. Such an attitude may result from the lack of understanding of the causes of bacterial infections, methods of their control and principles of action of antibiotics. Nevertheless, the same group of patients providing a negative reply to this question very often described garlic as a natural antibiotic, and declared that during infection they first consumed garlic, considered the antibiotic prescribed by a physician as a “necessary evil” and applied it if everything else fails. Some patients

(21.5%) replied that antibiotics are necessary to control bacterial infection, whereas 2.5% had no opinion concerning the two above-mentioned responses. The problem of the use of antibiotics is also noteworthy. Analysis of the replies showed that 98.3% of respondents applied antibiotic when there was such a need, while 1.6% of them mentioned that they have never used and do not use antibiotics, because they always apply home methods of treatment for all diseases which would require the application of medication of this type. Such an answer was provided by respondents aged over 60.

An important problem undertaken in the study was the frequency of use of antibiotics. It was found that 45.5% of respondents use these drugs more rarely than once a year, among whom as many as 60% were aged over 60. This confirms the fact that they do not have an inclination to overuse antibiotics. In the study group, 29% of patients admitted that they used an antibiotic once a year, while 17.5% - once in half a year, and 5.6% once in 2-3 months, which clearly shows a decreased immunity of an organism, which may result from many reasons, among others, not taking the drug for the entire period prescribed for a previous therapy. However, 1% of patients also declared that they apply an antibiotic more often than once in 2 months, and openly mentioned that they also applied self-medication with an antibiotic. The above-mentioned attitude of patients clearly indicates the lack of knowledge concerning the after-effects of such behavior which favors the spread of drug-resistance, not only for themselves, but also exerts an effect on others, and in a small population may lead to the lack of antibiotic effect.

An important problem which has been considered in the presented study is the expectations of

patients towards a physician with complaints which not always qualify for the use of an antibiotic. To the question: "While visiting a doctor with complaints such as a runny nose, cough, or sore throat do you expect the doctor to write a prescription for an antibiotic?" as many as 85.3% of respondents replied that they did not expect this. Many of them emphasized that the physician is the final decision maker in this respect. Such an attitude of a patient is entirely correct, because with this type of complaint, which may also accompany a cold or flu, an antibiotic should not be applied, because these diseases are on a viral background and the administration in this case of an antibacterial drug is a mistake. Some respondents (14.6%) reported that when visiting a doctor they expected a prescription for an antibiotic, because they considered that an antibiotic is a proven method of treatment and they do not seek other methods. It may be agreed that antibiotics are a proven method of treatment; but not, however, for all diseases. Here again the lack of patients' knowledge concerning antibiotics may be observed. While analyzing the replies, the wrong line of thinking about antibiotics is also noted which results also from the reluctance to obtain new information. Many patients assume that if some time ago a physician prescribed an antibiotic for similar complaints, and this drug proved to be effective, it should always be expected from a physician – quoting the words of one of the patients: "I know that an antibiotic is good and I think that it is better to take it at the beginning of the disease than allow the deterioration of the state of health". Because of this way of thinking by a patient, the phenomenon of resistance of pathogenic bacteria is continually spreading. With the first symptoms of a disease, taking an antibiotic

Table 7. Use of natural methods of treatment in order to avoid antibiotic therapy.

Patients' responses	Number and percentage of responses provided by rural inhabitants n = 406 (%)	Number and percentage of responses provided by urban inhabitants n = 203 (%)	Total number and percentage of responses n = 609 (%)
Antibiotic is a proven method of treatment and I do not look for other methods	63 (15.6%)	29 (14.3%)	92 (15.1%)
I feel safe because I know that an antibiotic will help me	26 (6.4%)	20 (9.9%)	46 (7.6%)
I always use home methods of treatment before I reach for an antibiotic	313 (77.3%)	153 (75.4%)	466 (76.6%)
I do not use antibiotics, because I prefer natural medications	3 (0.7%)	1 (0.5%)	4 (0.7%)

Table 8. Use of natural methods. (the respondents could answer many descriptions)

Patients' responses	Number and percentage of responses provided by rural inhabitants		Number and percentage of responses provided by urban inhabitants		Total number and percentage of responses	
	n = 406	%	n = 203	%	n = 609	%
I do not apply	79	19.5	42	20.7	121	59.6
Herb teas	269	66.3	126	62.1	395	194.6
Suction cups	254	62.6	105	51.7	359	176.8
Garlic, onion	288	70.9	134	66.0	422	207.9
Milk with honey	275	67.7	126	62.1	401	197.5
Other	66	16.3	31	15.3	97	47.8

is a big mistake, because frequently it is a simple cold which spontaneously regresses after 2-3 days (8). In many cases, situations arise when it is difficult to mobilize chronically ill patients to use other drugs, while they willingly take an antibiotic, even in non-justified cases. Considering the question: "What do you do in a situation when the doctor refuses to write a prescription for an antibiotic?", as many as 92.2% of respondents agreed with this decision and took medication ordered by the doctor. This is the correct attitude by a patient. Nevertheless, 6.5% of respondents are dissatisfied with such a decision; however, they take drugs prescribed by a physician, and simultaneously emphasize their lack of trust in the effect of agents other than antibiotics, and if the therapy is ineffective, they will come back to visit the doctor in a few days, asking again for an antibiotic. These are patients who have a tendency to overuse antibiotics. Only 1.3% of respondents decisively answered that when a physician refuses to write a prescription for an antibiotic, they go to another doctor to obtain it. This attitude by patients is inappropriate, because they do not know the processes taking place in an organism during a disease, and therefore, should not decide about the method of treatment. The closing of their minds to other methods of treatment primarily harms themselves. (9)

Responses to the question if the respondents always apply antibiotics on a doctor's order, or also apply self-medication, showed that 89.7% of them used antibiotics on the orders of a doctor, which is a very correct attitude of a patient. Unfortunately, 10.3% of respondents admitted that they applied self-medication with an antibiotic, which is highly incorrect, even a wrong-doing practice by a patient. The patients who independently apply antibiotics when answering from where they had obtained it,

mentioned a previous medication, which may indicate the lack of observance of a doctor's orders. Unfortunately, taking an antibiotic until the moment of improvement of the state of health and not by the end of the therapy is a relatively common problem. The patients do not realize the fact that an improvement in the state of health does not mean the elimination of all the pathogenic bacteria, hence, some strains are left in the body which, in the course of time, become resistant to an individual antibiotic and develop drug-resistance. Such a practice by a patient is wrong. As many as 8.2% of respondents obtained an antibiotic from a pharmacy which indicates an inappropriate role of a pharmacist during antibiotic therapy. The facilitation of access by a patient to an antibiotic over the counter is not a correct procedure by a pharmacist, because it contributes to a decrease in the effectiveness of antibiotic therapy (10)

The question deserves attention concerning the problem of seeking by patients of natural methods of medication to avoid antibiotics. It was found that 76.3% admitted that they always apply home methods of treatment before they reach for an antibiotic. This patient approach is correct, because in some ways it allows the organism to defend itself against a disease in a natural way. However, 15.3% of respondents considered that an antibiotic is a proven method of treatment and do not seek for other methods, whereas 7.7% of them mentioned that they feel safe when taking an antibiotic because they know that such a drug will certainly help them. In the two above-mentioned groups of replies, the attitude of patients indicates that they do not look for the methods of treatment other than by an antibiotic; they stick to antibiotic therapy, which is not always the right attitude. Respondents aged over 60 (0.7%) reported that they do not use antibiotics because

they prefer natural agents. This probably suggests a high acquired immunity of an organism. These patients were asked what they took more often during an infection, and 77% of them replied that they used an agent of natural origin, which indicates the fact of using various natural ways of medication and a high awareness of patients that an antibiotic is not a "wonder remedy" in all cases. Nevertheless, 23% of respondents reported that they often take an antibiotic during an infection, and the majority of these respondents were aged 18-30 years (80%). These patients emphasized the specific character of their occupational activity and lack of time for being ill, and in this way justified the decision about taking a potent drug.

Our survey results in Poland, confirm prior study in 11 European countries. This results indicate that, while the inappropriate attitudes and knowledge in the other domains are clustered in a few countries, lack of awareness of antibiotic resistance and adverse effects is a problem in all the participating European countries. This is an indication that most people in these countries still do not realize enough that excessive use of antibiotics is associated with serious risks affecting individuals as well as the ecosystem as a whole. Continuous efforts are needed to reduce these misconceptions (11). The high level of trust in restrictive prescribing as well as the awareness of antibiotic resistance expressed by the Swedish public should be utilized for education of Poles (12).

CONCLUSION

The presented studies allow the drawing of the following conclusions:

Patient knowledge concerning the action of an antibiotic was good. They correctly emphasized the properties and effect of an antibiotic, being aware that this is a drug of chemical origin, with mainly antibacterial and antifungal effect. They considered an antibiotic as an emergency exit, when home methods do not work, which should be applied when everything else fails. This is a correct attitude by the respondents, which evidences their good sense with respect to antibiotic therapy.

The respondents also had a good knowledge of drugs of natural origin. Patients often associate this term with agents on the basis of herbs or plants, without harmful substances, and often describe such medications as home methods of treatment. The majority of patients admitted that they always applied natural home medication without the use of an antibiotic. Such an attitude indicates the fact of a rational use of antibiotic therapy. The majority of

patients, in the first instance, chose drugs straight from nature and bore in mind that the overuse of antibiotics may have far-reaching consequences.

In the presented study, in a small percentage of patients, an overuse of antibiotics was observed. Very frequently this concerned young people, hurried and overworked, who admitted that they have no time to be ill, and even in the case of a slight infection they chose an antibiotic, which is evidence that they considered it as a preventive measure. Analysis of the experimental data showed that the second reason for antibiotic overuse is considering it as an agent increasing immunity.

In the case of antibiotic therapy, the problem of self-medication was due, among other things, to lack of patients' discipline through the use of them without consulting a physician. The respondents reported that they had an antibiotic left over from a previous therapy, from a pharmacy, family or acquaintances.

Acknowledgment

We would like to express our gratitude to Stanisława Byś for making research in the medical practice.

REFERENCES

1. Dzierżanowska D., Dzierżanowska-Fangrat K.: Guide of antibiotic therapy (Polish). Publisher Augustana, Bielsko-Biała 2010.
2. Kostowski W., Herman Z.: Pharmacology. The base of pharmacotherapy (Polish). Vol. 2, PZWL, Warszawa 2010.
3. Woroń J.: Antibiotic therapy: effectiveness and safety (Polish). Online: <http://www.pulsmedycyny.com.pl>, access: 17. 02. 2011.
4. Łagocka I., Maciejczyk A.: Pharmacovigilance (Polish). OINPHARMA, Warszawa 2008.
5. Great Medical Dictionary. Polish Academy of Sciences, Department of Medical Sciences (Polish). p. 52, PZWL, Warszawa, 1996.
6. Jakubiak L.: Let's make this orderliness (Polish). The Health Market, 1 (42), (2009).
7. Lambert H.P., O'Grady F.W.: Antibiotics and chemotherapy (Polish translation). p. 325, Medical Publisher, Warszawa 1994.
8. Rutter P. Community Pharmacy. Symptoms, diagnosis and treatment (Polish). Urban&Partner, Wrocław 2006.
9. Budzińska-Kotarska J.: The principles of antibiotic therapy (Polish). Online: <http://nazdrowie.pl>, access: 20. 04. 2011.

10. Kardas P.: The rational antibiotic therapy (Polish). Online: <http://nazdrowie.pl>, access: 20. 04. 2012.
11. Grigoryan L., Burgerhof J.G.M., Degener J.E. Deschepper F., Lundborg C.S. et al.: Pharmacoepidemiol. Drug Saf. 16, 1234 (2007).
12. Andre M., Vernby A., Berg J., Lundborg C.S.: J. Antimicrob. Chemother. 65, 1292 (2010).

Received: 24. 04. 2014