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“Monitoring and analysis of antibiotic consumption in Poland”

Streszczenie w języku angielskim

The doctoral dissertation entitled: “Monitoring and analysis of antibiotic consumption in Poland” is a series of four publications devoted to the methodology and characteristics of antibiotic use in Poland. It describes the methodology of monitoring antibiotic consumption and its application to the antibiotic policy. It also discusses the areas of excessive and inappropriate use of antibiotics, responsible for the emergence and spread of antibiotic resistance. Infections caused by antibiotic-resistant pathogens are one of the greatest challenges of modern medicine, pose a global threat to patients’ safety, health and life, cause the risk for the medical care capacity, and their treatment generates enormous costs. Due to its extent and spread, antibiotic resistance is considered a global priority for action by a number of public health, science, economics and politics institutions. Combating this phenomenon is possible only within the multi-sectoral strategies consistent with the “One Health” idea. According to global recommendations, it requires interdisciplinary activities including monitoring antibiotic resistance, consumption, antibiotic policy, infection control programs, modern diagnostics, education of medical professionals and the public, ensuring continuity of research into new drugs and vaccines, and international cooperation. Such strategies should be based on the actual knowledge of the epidemiology of antibiotic resistance, trends and structure of antibiotic therapies used. Measuring and analyzing the consumption of antibiotics can help in planning appropriate interventions.

The first part of this dissertation explains and classifies the methodology used for measuring the structure and dynamics of antibiotic consumption. It presents the practical use and limitations of the parameters measuring antibiotic consumption. It also emphasizes the role of monitoring antibiotic consumption in strategies combating the antibiotic resistance.

In the second publication, the seasonal trends in the use of antibiotics in primary care in different voivodeships in Poland were analyzed and compared to the influenza morbidity and influenza immunization. Observation of regional differences showed a positive correlation

between antibiotic consumption trends and influenza incidence, and an inverse correlation with influenza vaccination coverage. This publication shows the importance of integrated actions, including systematic monitoring of antibiotic consumption, analysis of its results and searching for the causes of interregional differences.

Another work relates to the hospital antibiotic policy. Strengths and weaknesses of such policy in Polish hospitals were assessed and areas requiring the most urgent measures or interventions were identified. Despite its high level of quality, insufficient organizational structures and insufficient use of microbiological diagnostics, have been noted. It indicated what elements require implementation and improvement.

The last of the works included in the series of the dissertation explored the problem of self-medication, which is an example of inappropriate and risky antibiotic therapy. This phenomenon in Poland was demonstrated on the example of an urban and rural area studied in a questionnaire survey conducted as part of the European project. Attention was drawn to the dangers of taking antibiotics without medical indications, such as the risk of side effects, ineffectiveness of therapy, or the spread of antibiotic resistance. It was emphasized that a rational decision to start antibiotic therapy requires the current clinical, microbiological, diagnostic and epidemiological knowledge, and such conditions are not fulfilled during self-treatment with antibiotics.

The analyzed areas of monitoring antibiotic consumption in Poland provided valuable knowledge for planning interventions to rationalize the use of antibiotics.

The dissertation entitled “Monitoring and analysis of antibiotic consumption in Poland” presented as the cycle of publications allows to draw the following conclusions:

1. The methodology of defined daily doses and the anatomic-therapeutic-chemical classification of the World Health Organization enables an objective comparison of the consumption of antibiotics in different geographic areas, in different health care sectors and at different time periods.
2. Analysis of the causes for the differences in the level of antibiotic consumption between voivodships helps to develop interventions aimed at reducing unnecessary and improved antibiotic therapy.
3. High levels of antibiotic consumption in primary care and similar to influenza incidence trends in antibiotic consumption indicate inappropriate use of antibiotics, which is one of the most significant causes of the emergence and spread of antibiotic resistance.

4. Implementation of the rational antibiotic therapy and infection prevention, including vaccination lead to limiting antibiotics consumption and thus antibiotic resistance.
5. Prevention, diagnosis and therapy of respiratory tract infections (the most common cause of antibiotic use) should be the subject of extensive educational activities aimed at medical professionals and the general public.
6. An effective and rational antibiotic policy require interdisciplinary activities in the areas of microbiological diagnostics, infection prevention and control.
7. Hospital microbiological diagnostics utilization is insufficient despite its high quality.
8. Self-medication with antibiotics, that constitutes the risk of antibiotic resistance and threatens patient safety, requires better control and should be the subject of educational campaigns.