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The Role and Responsibilities of Nurses, the Most Frequently Encountered Difficulties, and Proposed Solutions in Antimicrobial Stewardship

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Abstract

The increase in resistance to antimicrobial agents (microorganisms) is one of the most critical public health problems over the years. The responsibility of all health care workers in health care facilities is to prevent and decelerate the development of resistance of microorganisms. Nurses plan, practice, and observe therapy, and they can have countless contributions through isolation procedures, which is a crucial factor in controlling the spread of resistant microorganisms. The aim of this review is to summarize the implementation of nurses as part of antimicrobial stewardship programs, to discuss about some challenges that can occur during these implementations, and to present some solutions to nurses to overcome these challenges.

Keywords: ***Antimicrobial resistance, antimicrobial stewardship, the role of nurses***

Introduction

Antimicrobial resistance means the survival of resistant microorganisms (bacteria, viruses, some parasites, etc.) despite antimicrobial drugs (antibiotics, antiviral, and antimalarials). It is one of the most critical public health problems of today. Standard antibiotic treatment options are not effective against these microorganisms. Microorganisms that develop resistance to antimicrobial drugs increase morbidity and mortality rates, extend hospital stay length, and pose a life-threatening risk for other sick and healthy individuals.[1,2] Misuse or overuse of antimicrobial drugs is shown as the main reason for this global public health problem, the emergence of which is affected by many factors.[3] In the United States, while resistant microorganisms are detected in 2.8 million patients each year, more than 35 000 of these patients die.[2] According to the report published by the Organization for Economic Co-operation and Development (OECD) in 2016, an average of 700 000 people die due to antibiotic resistance every year. According to this report, our country has been declared as one of the countries that consume the most antibiotics and has the highest resistance rate (38%) among OECD countries. In the results of 2 studies conducted in multiple centers in our country in 2016 and 2018, the fatality rates due to resistant microorganisms were determined as 42% and 44%. The study results confirmed the OECD report.[4-7] Along with the announcement of the OECD report, efforts to prevent resistance are continuing increasingly in our country.[8]

Antimicrobial Stewardship

Antimicrobial stewardship refers to coordinated attempts to improve and evaluate the appropriate use of antimicrobial drugs by ensuring that the proper medication is selected in the proper dose, for the proper time, and by the correct route.[9] Within the scope of antimicrobial stewardship studies, it is aimed to reduce the rates of antimicrobial resistance that may occur, drug-related side effects, and the costs. At the same time, the patients receive their optimal treatment. These goals recommend that at least one "Antimicrobial Stewardship Working Group" should be formed that operates effectively in hospitals. This working group should meet regularly and implement feasible initiatives to prevent the development of resistance.[9,10] At least 1 infectious diseases specialist, infection control nurse, pharmacist, continuous quality improvement specialist, information technology specialist, a clinical microbiologist, and hospital manager

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should be included in this working group. The members of the nursing profession, who observe the patients for 24 hours, plan and implement the treatment of the patients, and closely monitor the effects of drugs, must also be included in these working groups.[11,12]

How Does Antibiotic Resistance Spread to Society?

It has been suggested that antibiotic resistance spreads in society in 2 different ways (Figure 1). The first way is that the microorganisms in the animal gastrointestinal system (GIS) develop antibiotic resistance against antibiotics given to animals unnecessarily and for a long time in animal farms. These resistant microorganisms can directly settle in the human GIS by consuming uncooked animal meat by humans. Furthermore, these microorganisms in the animal GIS can be transmitted to plants through fertilizers. These plants consumed by humans without washing well cause resistant microorganisms to settle in the human GIS and spread to society. The second way is the development of antibiotic resistance in the GIS of individuals against antibiotics (oral or parenteral) consumed by individuals in the wrong, excessive, or inappropriate conditions.[13] Along with nurses, other health care professionals play a crucial role in planning interventions to prevent the antibiotic resistance that occurs in a second way in health care centers and increase the awareness of patients and other health care workers.[14]

The Importance of Nurses in Antimicrobial Stewardship and Their Roles and Responsibilities in This Process

The roles and responsibilities of nurses in antimicrobial stewardship studies have gained increasing importance in recent years.[15] Many international leading associations and organizations in the field of antimicrobial stewardship such as the American Centers for Disease Control and Prevention, Infectious Diseases Society of America, and Joint Commission International frequently emphasize in their guidelines that nurses and even nursing students should be included in the education programs about antibiotic resistance and that the support given by nurses to antibiotic resistance prevention studies is one of the most important contributions.[11,16,17] The nurses' studies in this field are frequently reported in international publications.[3,12,15,18-20] Nevertheless, no relevant research has been found in our country, and our colleagues working in this process are still in need of sources.

Nurses constitute the professional group with the largest workforce in the hospital that spends 24 hours with the patient, closely monitors the patients, coordinates care, and constantly communicates with other disciplines. Many interventions are made within the scope of antimicrobial stewardship, with or without nurses' awareness, and these interventions are recorded.[21]

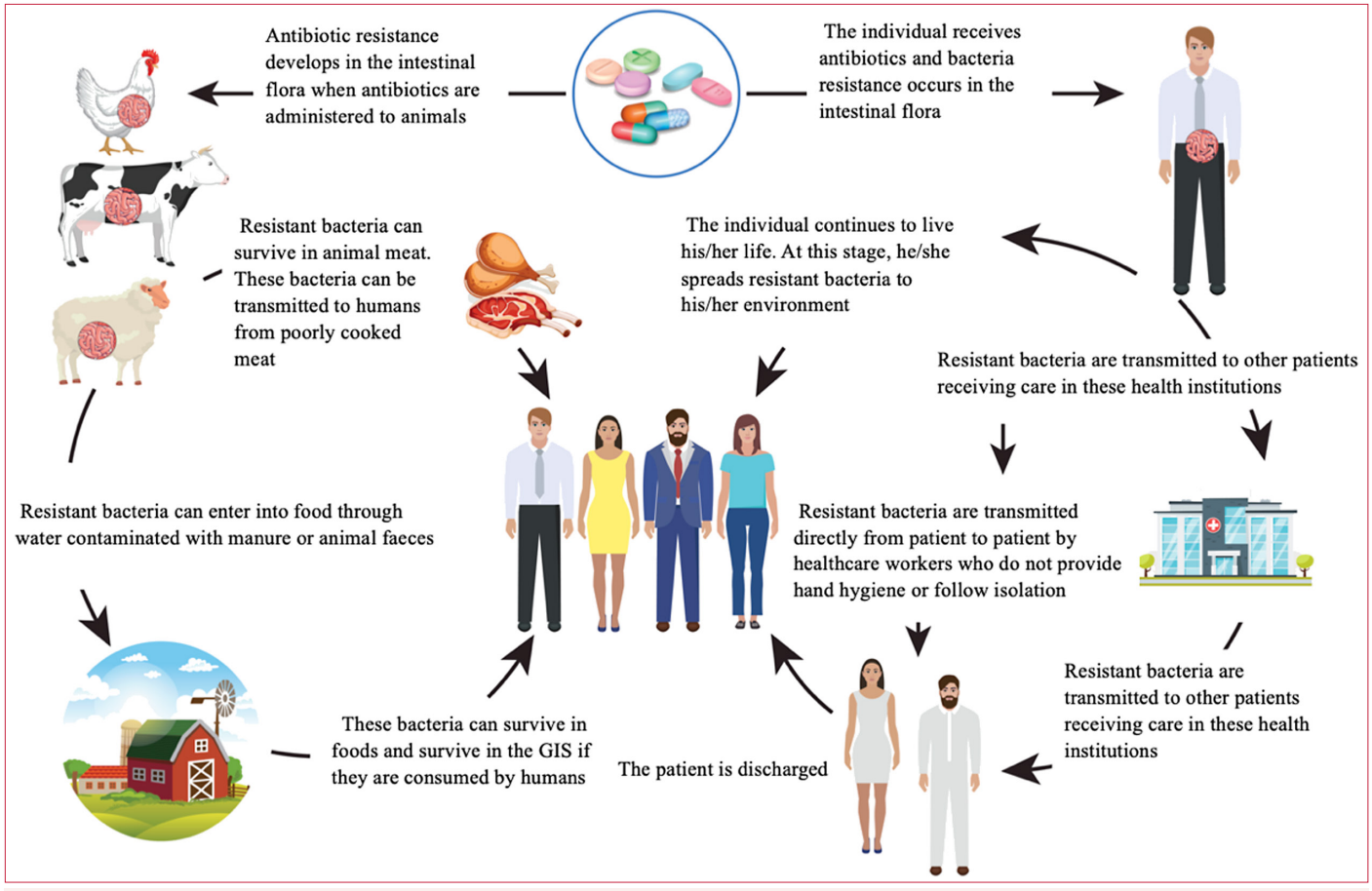

Figure 1. The spread of antibiotic resistance in society.[39]

According to international sources, the contributions of nurses to antibiotic stewardship and their roles and responsibilities in this process constitute the most important steps of antibiotic stewardship studies and differ in every area of the hospital. The roles and responsibilities undertaken according to changing areas include obtaining information about the allergy history of the patients and the treatments they constantly use, documenting this information, performing the initial triage and isolating the patient under necessary conditions, collecting microbiological samples of the patients, informing patients in this process, and administering the treatments prescribed to the patient according to the 8 right principles (right patient, right drug, right effect, right dose, right route, right drug form, right time, and good record) in drug administration.[14] Furthermore, the interventions performed by nurses include contributing to the regulation of the treatment by communicating with the physician prescribing the drug for switching antimicrobial treatment from a broad empirical treatment option to another less-comprehensive treatment (de-escalation) according to the culture result when microbiological sample examinations are concluded or for switching parenteral therapy of patients who are in good clinical condition and can tolerate oral therapy to oral therapy. Ensuring the reorganization of the treatment by communicating with the relevant units and persons to regulate the treatment options that are incompatible with the clinical pathways and guidelines developed in the hospital also contributes significantly to the prevention of the development of antibiotic resistance.[3,14,22,23]

Sharing the unexpected effect or side effect seen in the patient with other relevant health professionals (the patient's physician, infectious diseases specialist, pharmacist, quality department, etc.) by monitoring the patient's benefit from the treatment during daily observation, reporting this unexpected effect, and initiating the necessary actions regarding the appropriate treatment are among the responsibilities of nurses.[20,21,24] In addition to all these interventions, nurses train the patients and their relatives on this subject.[24] In this context, it is important that they attend training regularly and closely follow the national and international guidelines published on the subject to provide accurate and sufficient information to the patients and their relatives about antibiotic resistance. The patient's anxiety, whom the nurses train about the treatment, decreases, their compliance with the treatment increases, and the recovery time is accelerated.[3,14,25]

In addition to the roles and responsibilities of nurses in antimicrobial stewardship, general hygiene rules followed in the hospital are also of great importance. Hand hygiene is the most crucial general hygiene practice that should be considered to prevent the spread of resistant microorganisms. Compliance with hand hygiene rules is shown as the easiest, cheapest, and most effective way to prevent the spread of microorganisms.[26,27] In the studies conducted in this context, it has been reported that the occupational group with the highest awareness about hand hygiene rules is nurses.[28-30] Nurses regularly participate in awareness week activities and training on the importance of hand hygiene, comply with hand hygiene rules to protect patients and other health care workers, and take responsibility for the compliance and care of other health care workers.

Another effective way to prevent the spread of microorganisms is the isolation measures.[31] Nurses carry out all the care and treatment procedures of the patients followed under isolation measures by the isolation rules. The spread of resistant microorganisms within the hospital and thus the risk of the epidemic is prevented by care services carried out under appropriate conditions. In all these processes, nurses undertake the role of patient advocacy.[32]

Even though nurses have many roles and responsibilities regarding antimicrobial stewardship steps in their standard working order, many international organizations call for nurses to be included in the efforts to prevent resistance.[7,11,12] There is still a lack of relevant literature in our country. In this context, it is thought that nurses should adopt the treatment they apply more, should participate more frequently in antibiotic resistance prevention studies, and should contribute more to the literature.

Difficulties Experienced by Nurses in Antibiotic Stewardship and Proposed Solutions for These Difficulties

Antimicrobial stewardship studies are the joint responsibility of all health care professionals (nurses, physicians, pharmacists, quality improvement and information technology specialists, etc.), including nurses, not only the occupational groups who prescribe drugs or follow resistance.[14,24,33] In the studies carried out in this context, the roles and responsibilities of occupational groups in the antibiotic stewardship process should be clearly defined.[33] Within the scope of the defined roles and responsibilities, nurses should increase their knowledge and skills about antibiotic stewardship and closely follow the current literature.[14,33,34] Reminder roles should be used frequently according to current literature data. The most common problem in this process is experienced in cases where de-escalation or switch therapy is needed.[20] The recommendations and reminders to the treatment protocol by nurses may sometimes lead to misunderstandings due to communication reasons.[35,36] It is predicted that such problems that may be experienced due to inappropriate communication methods can be overcome by creating an open communication culture within the hospital, using structured communication tools (SBAR, IDRs, etc.) during communication, and using secure communication tools (mail, automatic message, reminder notes, etc.) more often.[35,37]

In this context, nurses should first increase their knowledge,[14,24,34] and they should use one of the structured communication tools and use technological communication methods more effectively in their communication processes within the hospital. Furthermore, the written definition of the roles and responsibilities they undertake in the antibiotic stewardship process will contribute significantly to solving the problems that may be experienced.[38]

Conclusion

The issue of antimicrobial resistance in health care centers is becoming increasingly important. In this context, it should be ensured that at least 1 member from the nursing profession is included in the antimicrobial stewardship working groups formed and that they take an active role in the planning and awareness studies. Furthermore, all nurses working in health institutions should actively participate in antibiotic resistance awareness activities and increase their knowledge by closely following the investigations. Preventing antibiotic resistance is the joint responsibility of all health care workers; in this context, nurses should be aware of their roles and responsibilities in the field, should actively participate in resistance prevention studies, and should contribute to the literature.

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