OPERATSIYADAN KEYINGI INFEKSIYALAR RIVOJLANISHIDA ANTIBIOTIK REZISTENTLIGINING O‘RNI

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Annotatsiya. Ushbu maqolada operatsiyadan keyingi infeksiyalar rivojlanishida antibiotik rezistentligining o‘rni tahlil qilinadi. Antibiotiklarga chidamli mikroorganizmlarning keng tarqalishi jarrohlik amaliyotidan keyingi infeksiyalarni davolashni murakkablashtirib, bemorlarning kasallanish va o‘lim ko‘rsatkichlarini oshiradi. Maqolada antibiotik rezistentligining asosiy mexanizmlari, xavf omillari, zamonaviy diagnostika usullari hamda antimikrob terapiyani oqilona qo‘llash tamoyillari yoritilgan. Shuningdek, operatsiyadan keyingi infeksiyalarning oldini olishda infeksiya nazorati va antibiotiklardan oqilona foydalanish dasturlarining ahamiyati ko‘rib chiqiladi.[1,3]

Kalit so‘zlar: operatsiyadan keyingi infeksiya, antibiotik rezistentligi, antimikrob terapiya, jarrohlik, infeksiya nazorati, ko‘p dori vositalariga chidamli mikroorganizmlar, antibiotiklardan oqilona foydalanish.

РОЛЬ АНТИБИОТИКОРЕЗИСТЕНТНОСТИ В РАЗВИТИИ ПОСЛЕОПЕРАЦИОННЫХ ИНФЕКЦИЙ

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Аннотация. В данной статье рассматривается роль антибиотикорезистентности в развитии послеоперационных инфекций. Распространение устойчивых к антибиотикам микроорганизмов значительно осложняет лечение послеоперационных инфекций, увеличивая показатели заболеваемости, смертности, продолжительность госпитализации и экономические затраты системы здравоохранения. В статье освещены основные механизмы формирования антибиотикорезистентности, факторы риска, современные методы диагностики, а также принципы рациональной антимикробной терапии. Особое внимание уделено программам

инфекционного контроля и рационального применения антибиотиков как эффективным мерам профилактики послеоперационных инфекций.[1,3]

Ключевые слова: послеоперационная инфекция, антибиотикорезистентность, антимикробная терапия, хирургия, инфекционный контроль, мультирезистентные микроорганизмы, рациональное применение антибиотиков.

THE ROLE OF ANTIBIOTIC RESISTANCE IN THE DEVELOPMENT OF POSTOPERATIVE INFECTIONS

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Abstract. This article examines the role of antibiotic resistance in the development of postoperative infections. The increasing prevalence of antibiotic-resistant microorganisms has become a major challenge in surgical practice, contributing to higher rates of morbidity, mortality, prolonged hospitalization, and increased healthcare costs. The article discusses the mechanisms of antibiotic resistance, major risk factors, modern diagnostic approaches, and the principles of rational antimicrobial therapy. In addition, it highlights the importance of infection prevention and control measures, antimicrobial stewardship programs, and evidence-based strategies to reduce the incidence of postoperative infections and improve patient outcomes.[1,3]

Keywords: postoperative infection, antibiotic resistance, antimicrobial therapy, surgery, infection prevention and control, multidrug-resistant microorganisms, antimicrobial stewardship.

Relevance of the Study. Antibiotic resistance has emerged as one of the most critical global public health challenges of the 21st century, significantly affecting the prevention and treatment of postoperative infections. The increasing prevalence of antibiotic-resistant microorganisms has reduced the effectiveness of conventional antimicrobial therapies, resulting in higher rates of postoperative complications, prolonged hospital stays, increased healthcare costs, and greater

morbidity and mortality. Surgical site infections caused by multidrug-resistant pathogens remain a major concern despite advances in surgical techniques and infection control practices.

The rational use of antibiotics, continuous microbiological surveillance, implementation of antimicrobial stewardship programs, and adherence to evidence-based infection prevention and control measures are essential strategies for reducing the incidence of postoperative infections. Understanding the mechanisms of antibiotic resistance and their impact on postoperative infectious complications is crucial for developing effective preventive and therapeutic approaches. Therefore, investigating the role of antibiotic resistance in the development of postoperative infections is a highly relevant and important area of contemporary medical research.[2,3]

Main Part. Postoperative infections remain one of the most common and serious complications in surgical practice, contributing significantly to patient morbidity, mortality, prolonged hospitalization, and increased healthcare expenditures. The widespread emergence of antibiotic-resistant bacteria has further complicated the prevention and treatment of these infections, making antimicrobial resistance a major challenge for modern healthcare systems.

The most frequently isolated pathogens associated with postoperative infections include *Staphylococcus aureus* (particularly methicillin-resistant *Staphylococcus aureus* [MRSA]), *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Enterococcus* spp., and *Acinetobacter baumannii*. Many of these microorganisms possess multiple resistance mechanisms, including enzymatic degradation of antibiotics, modification of antimicrobial target sites, reduced membrane permeability, active efflux pumps, and biofilm formation. These mechanisms enable pathogens to survive conventional antimicrobial therapy and increase the likelihood of persistent or recurrent infections.

Several risk factors contribute to the development of antibiotic-resistant postoperative infections. These include inappropriate or prolonged use of

prophylactic antibiotics, extensive surgical procedures, prolonged operative time, inadequate aseptic technique, intensive care unit admission, immunosuppression, advanced age, diabetes mellitus, obesity, and extended hospitalization. Careful assessment of these factors is essential for identifying high-risk patients and implementing targeted preventive measures.

Accurate microbiological diagnosis plays a pivotal role in the effective management of postoperative infections. Culture-based identification of pathogens, antimicrobial susceptibility testing, and rapid molecular diagnostic methods facilitate the selection of appropriate antimicrobial therapy. Evidence-based antibiotic prescribing, guided by local resistance patterns and microbiological findings, helps optimize treatment outcomes while minimizing the emergence of further resistance.

Prevention remains the cornerstone of reducing postoperative infections. Key preventive strategies include strict adherence to aseptic surgical techniques, appropriate timing and selection of perioperative antibiotic prophylaxis, effective sterilization of surgical instruments, proper wound care, continuous surveillance of surgical site infections, and implementation of antimicrobial stewardship programs. Multidisciplinary collaboration among surgeons, infectious disease specialists, microbiologists, pharmacists, and infection prevention teams is essential for improving patient safety and reducing the burden of antibiotic-resistant postoperative infections.[3,5]

Materials and Methods. This study is based on a comprehensive review and analysis of current scientific literature addressing the role of antibiotic resistance in the development of postoperative infections. Relevant publications were retrieved from internationally recognized scientific databases, including PubMed, Scopus, Web of Science, Google Scholar, and the World Health Organization (WHO) resources. Original research articles, systematic reviews, clinical guidelines, and meta-analyses published in recent years were included in the analysis.

The collected literature was analyzed using comparative, descriptive, and analytical methods. Particular attention was given to studies investigating the epidemiology of postoperative infections, mechanisms of antimicrobial resistance, multidrug-resistant pathogens, risk factors, microbiological diagnostic methods, antimicrobial stewardship programs, and evidence-based infection prevention strategies.

The obtained data were systematically evaluated and synthesized to identify current trends, major challenges, and effective approaches for the prevention and management of postoperative infections associated with antibiotic-resistant microorganisms.[9,10]

Conclusion. Antibiotic resistance has become a major determinant in the development and clinical outcome of postoperative infections. The increasing prevalence of multidrug-resistant microorganisms significantly reduces the effectiveness of conventional antimicrobial therapy, leading to prolonged hospitalization, higher treatment costs, increased postoperative complications, and elevated morbidity and mortality. Early microbiological diagnosis, evidence-based antibiotic selection, and continuous surveillance of local antimicrobial resistance patterns are essential for improving treatment outcomes.[2,8]

Furthermore, the implementation of antimicrobial stewardship programs, strict adherence to infection prevention and control measures, and rational use of antibiotics are fundamental strategies for limiting the spread of resistant pathogens. A multidisciplinary approach involving surgeons, microbiologists, infectious disease specialists, pharmacists, and infection control teams is crucial for reducing the incidence of postoperative infections and improving patient safety. Continued research into antibiotic resistance mechanisms and innovative therapeutic approaches will be essential for addressing this growing global healthcare challenge.

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