https://www.proconference.org/index.php/usc/article/view/usc22-00-013
DOI: 10.30888/2709-2267.2024-22-00-013

UDC 579.862.1:615.33.015.8].087.1(474.5)

STATISTICAL ANALYSIS OF VANCOMYCIN-RESISTANT ENTEROCOCCI ISOLATED FROM THE BLOOD OF PATIENTS IN LITHUANIA

Matylonok Tatiana / Матильонок Т. Ю.
ORCID: 0000-0002-5551-1954
National public health surveillance laboratory, Vilnius, Lithuania, 10210,
Національна лабораторія громадської охорони здоров'я, Вільнюс, Литва, 10210
Polishchuck Nataliia / Поліщук Н. М.
PhD, Assistant Professor /канд. мед. наук, доцент
ORCID iD 0000-0002-9791-5818
Department of Microbiology, Virology and Immunology,
Zaporizhzhia State Medical and Pharmaceutical University, Ukraine. 69035
кафедра мікробіології, вірусології та імунології,
Запорізький державний медико-фармацевтичний університет, Україна, 69035
Algirdas Griskevicius / Algirdas Griškevičius
Deputy Director / Direktoriaus pavaduotojas
National public health surveillance laboratory, Vilnius, Lithuania, 10210,
Nacionalinės visuomenės sveikatos priežiūros laboratorijos

Abstract. *The widespread dissemination of vancomycin-resistant enterococci (VRE) poses a serious threat to the modern healthcare system. Currently, in most hospitals in Lithuania, VRE is among the most common pathogens causing infections in patients due to medical interventions. A crucial step in combating the spread of VRE is considered to be the continuous monitoring of the circulation of these strains, as well as comprehensive study of their biological properties.*

Key Words: *vancomycin resistant enterococci* (*VRE*), *healthcare-associated infections, blood.*

Vancomycin-resistant enterococci (VRE) are a common cause of urinary tract infections, intra-abdominal infections, bacteremia, or endocarditis [1]. In 2017, the World Health Organization (WHO) included VRE in the list of high-priority pathogens for which new antibiotics need to be developed [2]. VRE ranks second among the causes associated with nosocomial infections and is a leading cause of bacteremia and sepsis in patients undergoing treatment in emergency care hospitals and oncology departments [3]. According to the American Centers for Disease Control and Prevention (CDC USA), in 2017, VRE caused 54,500 infections among hospitalized patients, resulting in 5,400 deaths [4]. Infections caused by VRE are characterized by a severe clinical course, requiring combined antibiotic therapy and a subsequent extended recovery period for the patient.

The aim of the work is retrospective analysis of the isolation of vancomycin-resistant enterococci (VRE) from the blood of patients undergoing treatment in healthcare facilities in Lithuania. Study Period: 2019 – 2023.

Materials and Methods: Data were obtained from reports of the National Public Health Laboratory (NVSPL), compiled based on a detailed examination of the biological properties of VRE isolated from the blood of patients treated in Lithuanian hospitals. The species identification of VRE was confirmed using an automated bacterial identification device MALDI-TOF (Germany, BRUKER Microflex), and the sensitivity of VRE to antibiotics was determined using the disk diffusion method according to EUCAST.

Results: During the period from 2019 to 2023, specialists from NVSPL examined and confirmed 559 strains of vancomycin-resistant enterococci (VRE) isolated from the blood of patients undergoing treatment in various hospitals in Lithuania (figure 1).

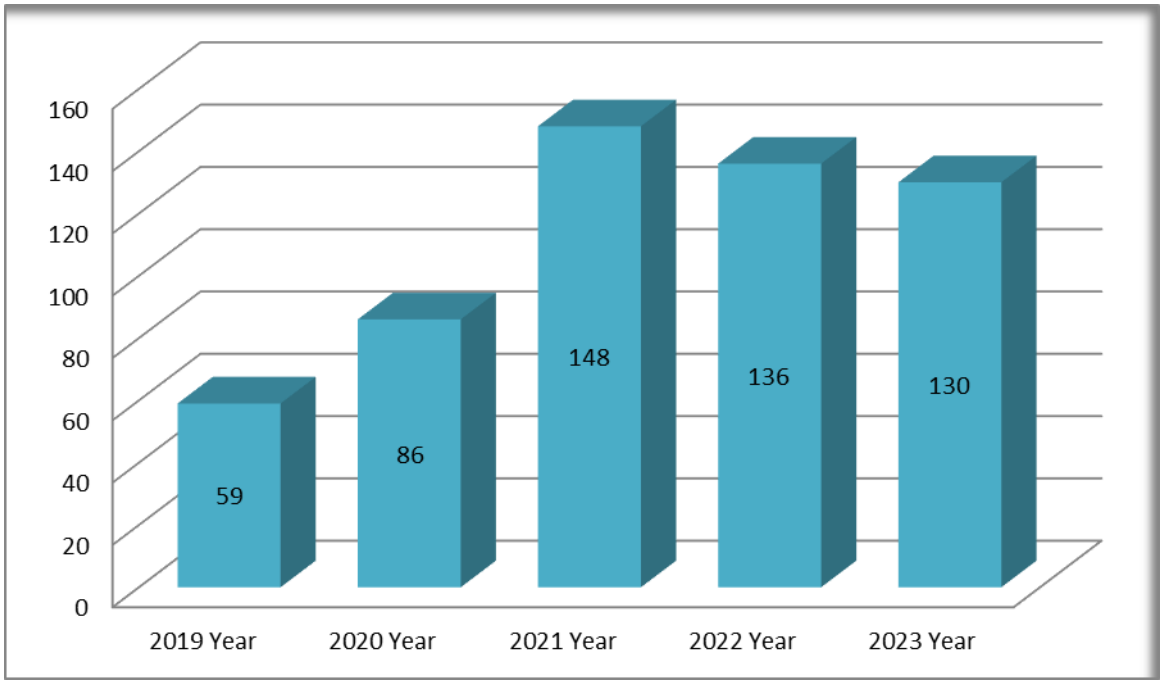

Figure 1. Number of VRE isolated from the blood of patients in Lithuania for the years 2019-2023, absolute count.

The smallest number of vancomycin-resistant enterococci (VRE) was detected in 2019 (59 strains, 10.6% of the total number of isolates). However, starting from 2020, the annual count of isolated vancomycin-resistant enterococci rapidly increased. In comparison to 2019, in 2020, there was a 1.5-fold increase in the number of cultures isolated (86 strains, 15.4% of the total number of isolates), and in 2021, a 2.5-fold increase (148 strains, 26.5% of the total number of isolates). In 2022 and 2023, specialists from NVSPL examined 136 (24.3%) and 130 (23.3%) VRE strains isolated from the blood of patients, respectively. These figures are lower than those in 2021 but significantly higher than the data for 2019 and 2020.

The significant increase in the number of vancomycin-resistant enterococci (VRE) isolated from the blood of patients necessitates the enhancement of a comprehensive set of preventive measures aimed at preventing the spread of these microorganisms within the hospital setting. Initial screening for VRE colonization upon a patient's admission to the hospital, judicious use of antibiotics, modernization of the microbiological monitoring system considering the emergence of new antibiotic resistance mechanisms, and other measures constitute effective steps in a comprehensive approach to addressing this clinical and epidemiological challenge.

Conclusions:

1. It has been established that starting from 2019, the number of vancomycin-resistant enterococci (VRE) isolated from the blood of patients in various hospitals in Lithuania has steadily increased.

2. Systematic microbiological monitoring of VRE circulation reveals the pattern of spread of this pathogen within hospitals, making it an important and integral component of the strategy to contain antibiotic resistance in healthcare facilities.

Literature:

1. Levitus M., Rewane A., Perera T. B.. Vancomycin-Resistant Enterococci. // StatPearls [Internet]. National Library of Medicine. – 2023. https://www.ncbi.nlm.nih.gov/books/NBK513233/

2. Gorrie C. Et al. Genomics of vancomycin-resistant Enterococcus faecium // Microbial genomics. – 2019. – T.5 (7). E000283. Doi: 10.1099/mgen.0.000283.

3. Miller WR, Murray BE, Rice LB, Arias CA. Resistance in vancomycin-resistant enterococci // Infectious Disease Clinics. – 2020. – T.34 (4). – C.751-771 doi:10.1016/j.idc.2020.08.004

4. CDC. Antibiotic resistance threats in the United States, 2019. Atlanta (GA): U.S: Department of Health and Human Services; 2019. https://www.cdc.gov/drugresistance/pdf/threats-report/vre-508.pdf

5. Furtado G.H.C. et al. Risk factors for vancomycin-resistant Enterococcus faecalis bacteremia in hospitalized patients: an analysis of two case-control studies // American journal of infection control. – 2006. – T.34. (7). – C. 447-451 https://doi.ord/10.1016/j.ajic.2005.08.015