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Identification and characterization of infections with antibiotic-resistant bacteria in immunocompromised patients

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Antibiotic-resistant bacterial infections pose a serious threat to global health, impacting heavily immunocompromised patients. The aim of the project was to characterize infections caused by antibiotic-resistant bacteria in immunocompromised patients, and to build up a collection of alert pathogens and those with multiple drug resistance, for the future use in research. Collected samples from immunocompromised patients were analysed to identify bacteria in the samples and determine the Minimum Inhibitory Concentration (MIC) values for antibiotics, using MicroScan Autoscan 4 (Beckman Coulter). Obtained data were subjected to statistical analysis. In the study 125 samples from immunocompromised patients were analysed. Patients from whom the samples were collected fell mainly into 3 groups: oncological (36%), diabetes (19,2%) and alcohol dependence syndrome patients (15,2%). The rest of patients (29,6%) were diagnosed with chronic respiratory, cardiovascular and nephrological diseases, obesity and rheumatoid arthritis, but due to non-representative numbers, they were excluded from the analysis. Of all isolated bacteria in the study, the most prevalent was *K. pneumoniae* (in 65,6% of collected samples) followed by *E. coli* (20%). The antibiotic resistance analysis was based on the MIC values of antibiotics, of which β -lactam antibiotics were selected. Resistance mechanisms, especially MBL coexisting with ESBL and ESBL alone, were observed across patient groups. In the group of oncological patients, the most common resistance mechanisms were MBL coexisting with ESBL (59.46%) and ESBL (32.43%). Similar mechanisms predominated in diabetic patients MBL+ESBL and ESBL (38.9% each). In patients with alcohol dependence syndrome, ESBL (46.67%) predominated as in the other patient groups and CPE (26.67%).

Biography

Krzysztof Lubocki graduated in microbiology from the University of Wrocław in 2019. After completing my studies, I have been involved in microbiological and genetic diagnostics. Currently, I work as a microbiologist at the Population Diagnostics Center Łukasiewicz – PORT Center for Population Diagnostics is the first center of its kind in Poland. It aims to research in the field of modern diagnostic methods for many infectious and civilization diseases. The Center for Population Diagnostics will significantly contribute to increasing the biomedical safety of society. Research on pathogens causing infectious diseases (e.g. SARS-CoV-2, SARS) will enable immediate action in the event of an epidemiological threat. The center will include the BSL-3 standard epidemiological rapid response laboratory – the first in western Poland and one of only a few in the whole country. It will be characterized by one of the highest classes of biosafety, giving the possibility to work with microorganisms from various risk groups.

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