CARRIAGE OF SELECTED ALARM PATHOGENS IN HAEMATOLOGICAL PATIENTS HOSPITALISED IN A UNIVERSITY-AFFILIATED HOSPITAL

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Introduction and purpose

In recent years there was a significant rise in the number of patients colonised or infected by multidrug-resistant strains of bacteria. Therefore, microbiological screening tests are increasingly being used in order to limit the spread of these microorganisms and prevent epidemic outbreaks caused by them. Oncohaematological patients are particularly prone to infections caused by endogenous bacterial flora, due to immunosuppression caused by their disease or administered treatment.

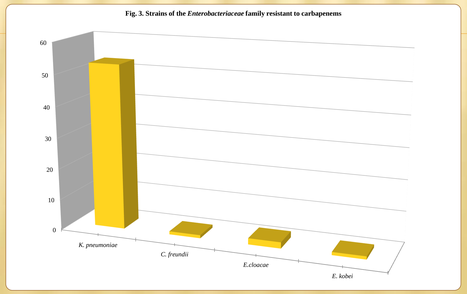
The aim of the study was to perform an epidemiological analysis of the faecal carriage of the selected alarm pathogens in haematological patients.

Material and methods

The study material comprised of rectal swabs, obtained from the patients hospitalised in a haematology ward of the tertiary care, university-affiliated hospital in the period 01.01.2015 – 30.06.2016. The samples were inoculated onto selective chromogenie media for preliminary isolation and identification of bacterial strains characterized by antibiotic resistance mechanisms, such as MRSA, VRE, ESBL, KPC or MBL, and also strains resistant to carbapenems due to other mechanisms than enzymatic. Identification of the bacterial strains was done with the use of MALDI-TOF MS technique (MALDI Biotyper Microflex LT, Bruker). Each of the isolated strains was subsequently tested by phenotypic methods to identify the resistance mechanism. In diagnostics of carbapenemase-producing Gram-negative rods, a biochemical (Carba NP) and PCR (GeneXpert) tests were also used. Testing and interpretation of the results were done according to the current recommendations of the EUCAST and the National Reference Centre for Susceptibility Testing (KORLD).

Conclusions

1. In the analysed material, ESBL-producing Gram-negative rods of the *Enterobacteriaceae* family were detected in >26% of patients.
2. Gram-negative MBL(+) rods were present in the samples obtained from almost 5% of patients.
3. In the analysed period only 2 strains of KPC(+) rods were detected.
4. Faecal carriage of VRE strains was detected in 12.6%, and MRSA – in 1.3% of patients.
5. In the analysed samples, 10 (1.3%) strains of MRSA were cultured.



Results

In the analysed period, in total 5037 rectal swabs were obtained from 803 patients for detection of carbapenemase-producing (MBL, KPC) bacterial strains. We detected 39 MBL(+) nonrepetitive strains, including 30 strains of *K. pneumoniae* (76.9%), 7 strains of *P. aeruginosa* (17.9%), 1 strain of *E. coli* (2.6%), and 1 strain of *C. braakii* (2.6%). In the tested samples we also detected 2 KPC(+) strains. Among these specimens, 2317 swabs from 769 patients were also tested for the presence of MRSA, VRE, and ESBL(+) strains. We isolated 202 nonrepetitive ESBL(+) strains, which constituted 26.3% of all strains. The most common were strains of *Klebsiella pneumoniae* – 115 (56.9%), followed by *Escherichia coli* – 71 (35.1%), and *Enterobacter cloacae* – 8 (4.0%). Analysis of the faecal carriage of VRE comprised 97 (12.6%) nonrepetitive strains, including 81 strains of *E. faecium* (83.5%), 15 strains of *E. faecalis* (15.5%), and 1 strain of *E. hirae* (1.0%). In the analysed samples, 10 (1.3%) strains of MRSA were cultured.