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Analysis of Risk Factors for Multiantibiotic-Resistant Infections among Ukrainian Patients at a Children's Hospital

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Background

The World Health Organization has named antibiotic resistance as one of the most important public health threats of the 21st century. Multidrug-resistant infections are associated with increased mortality compared to those caused by susceptible bacteria and they carry an important economic burden. Obtaining knowledge about risk factors may provide possible evidence for prevention and control strategies of multiantibiotic-resistant infections.

Methods

211 patients at Sumy Regional Children's Clinical Hospital were enrolled in the study: 39% (n=82) were multiantibiotic-resistant infection cases (average age±SD 6.34±5.153 years, 71 girls and 58 boys); 61% (n=129) – were cases without multiantibiotic-resistance (average age 9.02±4.832 years, 37 girls and 45 boys). The clinical laboratory information monitoring system and the medical record system were used to collect patient information. Microsoft Excel and SPSS software were used for the statistical analysis. To predict the occurrence of multi-antibiotic resistance infections among pediatric patients, a logistic regression model was created.

Aim

To identify the potential risk factors for multiantibiotic-resistant infections among Ukrainian pediatric patients.

Results

Among patients with multi-antibiotic-resistant infection 52% (n=43) were from somatic departments and 48% (n=39) from surgical departments; 54% (n=44) were hospitalized in the fall-winter season. Among patients without multi-antibiotic-resistant infection 75% (n=97) were from somatic departments and 25% (n=32) from surgical departments; 63% (n=81) were hospitalized in the spring-summer season. According to binary logistic regression data, a higher risk of developing multi-antibiotic-resistant infections have patients from surgical departments (P=0.01, OR=2.749, 95% CI=0.202-0.656) and who were hospitalized in the fall-winter season (P=0.019, OR=1.954, 95% CI=1.114-3.428). Older children have a lower risk of developing multi-antibiotic resistance compared to younger children (P<0.001, OR=0.897, 95% CI=0.846-0.951).

Conclusion

This study suggests the inclusion of younger age, surgical type of department and fall-winter hospitalization season as risk factors for multiantibiotic-resistant infections among Ukrainian pediatric patients.