Short Communication

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Antimicrobial Resistance Patterns and Extended-Spectrum Beta-Lactamase Production

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Abstract

Introduction. Klebsiella species cause pneumonia, UTI, and septicemia in human beings. Beta-lactam drugs are used extensively to treat patients infected with Klebsiella, but most of the Klebsiella species are resistant to third- and fourth-generation cephalosporins and monobactams to which data are scarce in the study area. Objective. To determine the prevalence, antimicrobial resistance, ESBL production, and associated risk factors of Klebsiella species among UTI-suspected patients in Bahir Dar City, Northwest Ethiopia. Methods. A multi-institution-based prospective cross-sectional study was conducted from January to May 2019. Midstream urines were collected from 385 patients and inoculated onto CLED and MacConkey agars. Identification of growth was done by a battery of biochemical tests. Antimicrobial resistance and ESBL production patterns were determined by using the disc-diffusion method on Mueller–Hinton agar. Quality of data was maintained by following SOPs and using Klebsiella pneumoniae (ACTT700603). Logistic regression statistical analysis was done using the SPSS, version 25, statistical package. A value ≤ 0.05 was considered statistically significant. Results. The median age of the study participants was 32 years. Majority of them were female, urban residents, and unable to read and/or write. The total Klebsiella species detected were 38 (9.9%). Of which, 25 (65.8%) were Klebsiella pneumoniae, followed by 6 (15.8%) Klebsiella ozaenae. 20 (80%), 19 (76%), and 19 (76%) Klebsiella pneumoniae showed resistance to amoxicillin/clavulanic acid, ampicillin, and cotrimoxazole, respectively. All K. oxytoca were resistant to ampicillin, and all K. rhinoscleromatis were resistant to cefoxitin and cefotaxime. Klebsiella species that showed resistance to ≥3 antimicrobials were 26 (68%). ESBL-producing Klebsiella species were 10 (26.3%). Patients who had history of antibiotic use, hospitalization, and tight dressing habit had more risk of getting UTI () than their counterparts. Conclusions. Overall UTI prevalence in our study was lower than that of previous Ethiopian studies. High MDR and ESBL-producing Klebsiella species were detected. Patients' history of antibiotic use, hospitalization, and tight dressing habit were risk factors for UTI. It calls up for improving prevention/control systems of Klebsiella species.

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