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Antibiotic resistance and sensitivity pattern of Metallo-β-Lactamase Producing Gram-Negative Bacilli in ventilator-associated pneumonia in the intensive care unit of a public medical school hospital in Bangladesh (Article)

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Abstract

BACKGROUND: Ventilator-associated pneumonia (VAP) is the most common nosocomial infection in intensive care units (ICU), accounting for 25% of all ICU infections. Antimicrobial resistance is increasing and becoming a significant health problem worldwide, increasing hospital length of stay, mortality and costs. Identifying antibiotic resistance patterns in VAP is important as this can cause outbreaks in ICUs. To date, there have been limited studies assessing this in Bangladesh. Consequently, the primary objective of this research was to study the species of bacterial growth and to determine the antibiotic resistance patterns of Metallo-β-Lactamase (MBL) producing gram-negative bacilli among ICU patients with VAP in a public medical school hospital, Bangladesh. In addition, identify the factors associated with a positive culture to provide future guidance. METHOD: Cross-sectional study performed in the Chattogram Medical College Hospital, Bangladesh. Mueller Hinton agar plates were used for antibiotic sensitivity testing by the Kirby-Buer disc diffusion test. RESULTS: Among 105 clinically suspected VAP cases, qualitative cultures were positive in 95 (90%) of them. The most common bacteria identified were Acinetobacter spp. (43.2%), Klebsiella spp. (20%) and Pseudomonas spp. (18.9%). A positive culture was not associated with patients' age or gender. Among 41 isolated Acinetobacter spp., 38 (92.7%) were resistant to gentamicin followed by 36 (87.8%) to ceftriaxone. Among 24 isolated Klebsiella spp., 22 (83.3%) were resistant to ceftriaxone. Among 18 isolated Pseudomonas spp., 16 (88.8%) were resistant to ciprofloxacin, and 13 (72.2%) were resistant to ceftriaxone. Among nine isolated E.coli, all were resistant to ceftriaxone and ciprofloxacin. All four Proteus spp. (100%) isolated were resistant to ciprofloxacin. Additionally, phenotype MBL producing was 65.22% and genotype was 45.65% among imipenem resistant pathogens. Imipenem resistant pathogens were sensitive to amoxyclav, amikacin¸ azithromycin, ceftazidime, ceftriaxone, colistin and gentamycin. CONCLUSION: A positive culture was detected in 90% of VAP patients, but it was not associated with the patients' age and gender. The most common bacteria identified were Acinetobacter spp., Klebsiella spp. and Pseudomonas spp., where the majority of these were resistant to ceftriaxone. The results are being used to provide future guidance on the empiric management of VAP in this hospital.

SciVal Topic Prominence

Topic: Carbapenems | Integrons | Pseudomonas Aeruginosa

Prominence percentile: 95.347

Author keywords

Antibiotic Resistance | Bangladesh | HCAIs | Healthcare-Associated Infections | Intensive Care Unit | Public Medical School Hospital

Indexed keywords

EMTREE drug terms: beta lactamase

EMTREE medical terms: adolescent | adult | aged | antibiotic resistance | Bangladesh | cross-sectional study | epidemiology | female | Gram negative bacterium | human | isolation and purification | male | microbial sensitivity test | microbiology | middle aged | ventilator associated pneumonia | very elderly | young adult

MeSH: Adolescent | Adult | Aged | Aged, 80 and over | Bangladesh | beta-Lactamases | Cross-Sectional Studies | Drug Resistance, Microbial | Female | Gram-Negative Bacteria | Humans | Male | Microbial Sensitivity Tests | Middle Aged | Pneumonia, Ventilator-Associated | Young Adult

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