

TITLE: MULTIDRUG-RESISTANT GRAM-NEGATIVE BACTERIA IN SEWAGE FROM BELEM CITY (PA).

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Multidrug-resistant bacteria have been finding favorable dissemination conditions due to continuous use of antimicrobials in clinical issues and the deficiency of basic sanitation services. Around the major cities, the sewage discharge in pluvial water is elevated, producing organic matter that helps to favor the bacterial growth. Wastewater treatment processes may not provide assurance to spread of antibiotic resistant bacteria. It becomes more critical when untreated sewage is deposited directly into the river, implying a high risk of microbial contamination. The present study aimed to characterize multidrug-resistant Gram-negative bacteria from sewage in Belem-PA. The sewage samples were collected at a Sewage Station near the city's edge. The samples were diluted in 1:20 and 1:50 and 200µL were cultured on MacConkey Agar e SS Agar with imipenem (1µg/mL) (35 °C /24 hours). The identification and antimicrobial susceptibility testing were performed by Vitek-2 automated system, using the GN and AST 239 cards. Eighteen multidrug-resistant bacteria isolates were identified. The most frequent bacterial genus was for *Enterobacter* spp (67% - 12/18), followed by *Providência* spp (11% - 2/18), *Acinetobacter*, *Klebsiella*, *Pantoea* and *Chromobacterium* (5% each - 1/18). Among the 17 analyzed isolates, 10 different resistance profile were identified. The most frequent phenotypic resistance was AMP-SAM-PIT-CXM-CXA-CFO-CRO-ERT-IMP-MPM-GEN-CIP (47,8% - 8/17) found in *Enterobacter* spp, followed by AMP-SAM-PIT-CXM-CXA-CFO-CRO-ERT-IMP-MPM-GEN-CIP-TGC, AMP-SAM-PIT-CXM-CXA-CFO-CAZ-CRO-ERT-IMP-MPM-CIP, AMP-SAM-PIT-CXM-CXA-CFO-CRO-ERT-IMP-MPM-CIP and AMP-SAM-PIT-CXM-CXA-CFO-CRO-CPM-CIP (5,8% each - 1/17). The genus *Providência* spp was the less resistant to antimicrobials: AMP-SAM-PIT-CXA-GEN-TGC-CS and AMP-SAM-CXA-GEN-TGC-CS. The profile from the genera *Acinetobacter*, *Klebsiella* e *Pantoea* were AMP-SAM-CXM-CXA-CFO-CAZ-CRO-CPM-IMP-MPM-GEN-CIP, AMP-SAM-PIT-CXM-CXA-CFO-CAS-CRO-CPM-ERT-IMP-MPM and AMP-SAM-PIT-CXM-CXA-CFO-CRO-CPM-CIP, respectively. The resistance profiles found in sewage samples in Belem-PA, demonstrate environmental contamination by multidrug-resistant bacteria that offer a risk to the population's health and require a special attention from the responsible authorities.

Keywords: bacteria, Gram-negative, multidrug-resistance, sewage.

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