

# The Magnitude and Drug Resistance Profile of Extended Spectrum B-Lactamase (Esbl) Producing Gram-Negative Bacteria from Different Inanimate Objects at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia

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## Research

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# Abstract

**Background:** Infections caused by gram-negative bacteria are causing morbidity and mortality worldwide. The production of extended-spectrum  $\beta$ -lactamases (ESBLs) is an important mechanism that is responsible for resistance to the third-generation cephalosporin. The purpose of this study was to determine the magnitude and drug resistance profile of ESBL producing gram-negative bacteria isolated from various inanimate objects at Tikur Anbessa Specialized Hospital.

**Methods:** Laboratory based cross-sectional study was conducted involving a total of 216 isolates from January to March 2019. The samples were taken from different inanimate objects at Tikur Anbessa Specialized Hospital using pre-moistened sterile swabs. Screening of ESBLs was done using ESBL CHROME agar and confirmed with combined disk diffusion test. Antimicrobial susceptibility testing was done by disc diffusion method. The data were analyzed using SPSS software version 20 and descriptive statistical tests were performed.

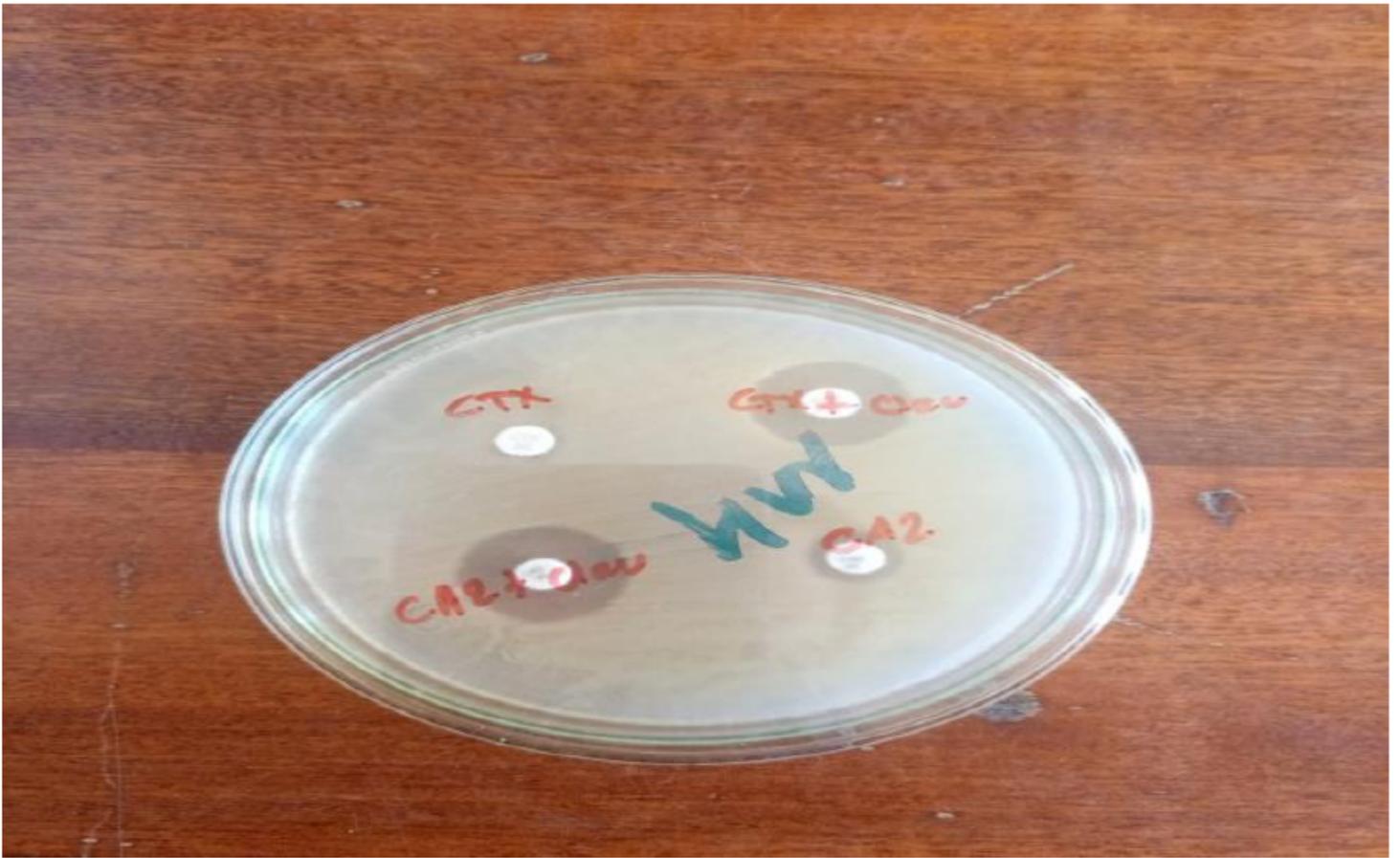
**Results:** 33/216 (15.3%) isolates were found to be ESBL producers based on the confirmatory test (combined disk method). Different ESBL producing gram-negative bacteria were isolated from the various inanimate objects of TASH including, *Klebsiella ozaenae*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, *Klebsiella rhinoscleromatis*, *Citrobacter* spp, *Escherichia coli*, *Serratia* spp and *Acinetobacter* spp. The isolates were found to be 100% resistant to ceftazidime and ceftriaxone.

**Conclusion:** It is worrisome to detect ESBL producing gram-negative bacteria from the inanimate objects of TASH, calling for systematic screening of inanimate objects for ESBL and other multidrug-resistant bacteria in the hospital. Furthermore, strengthening the infection prevention practice is vital to halt the transmission of these microorganisms.

## Full Text

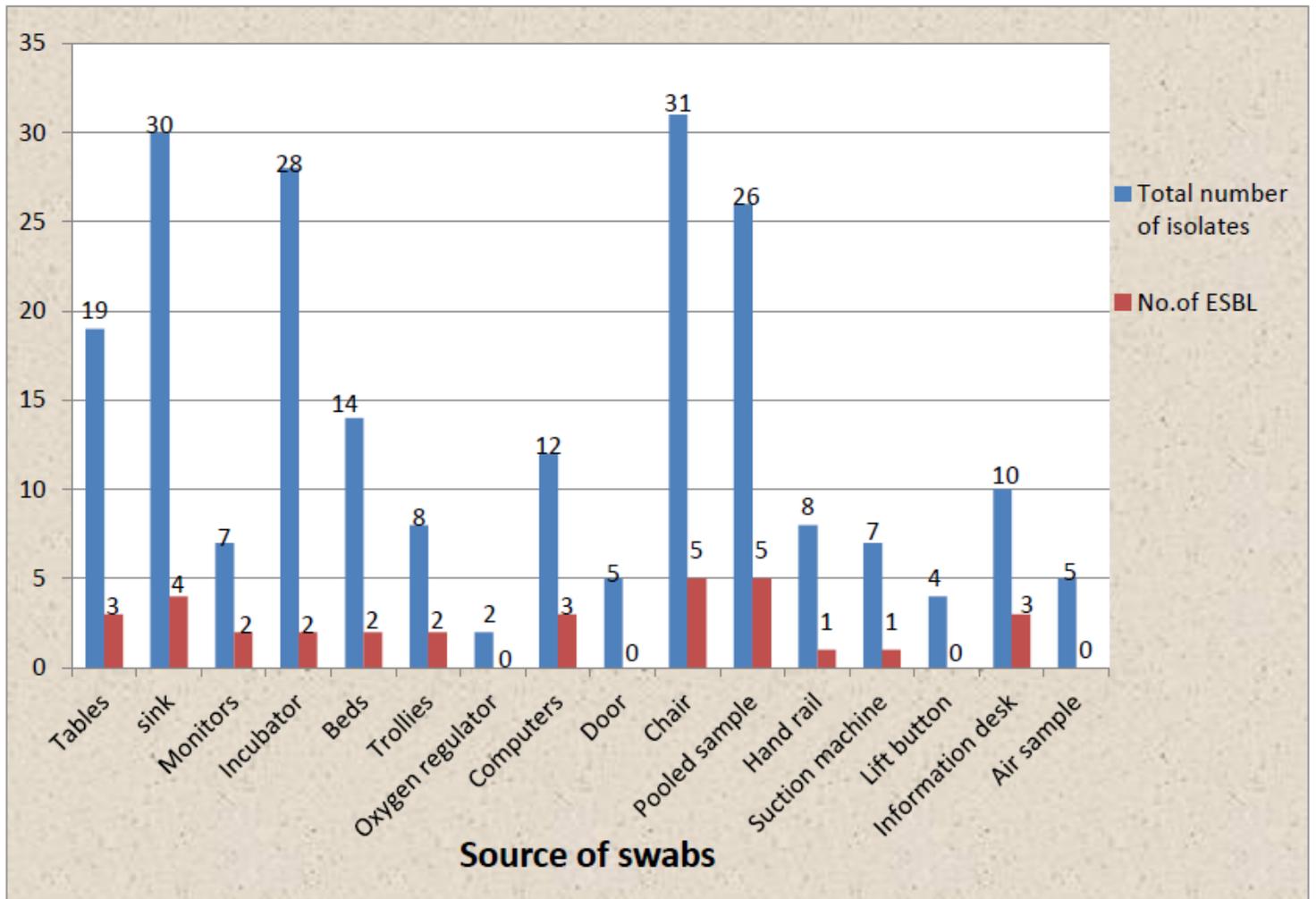
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## Figures



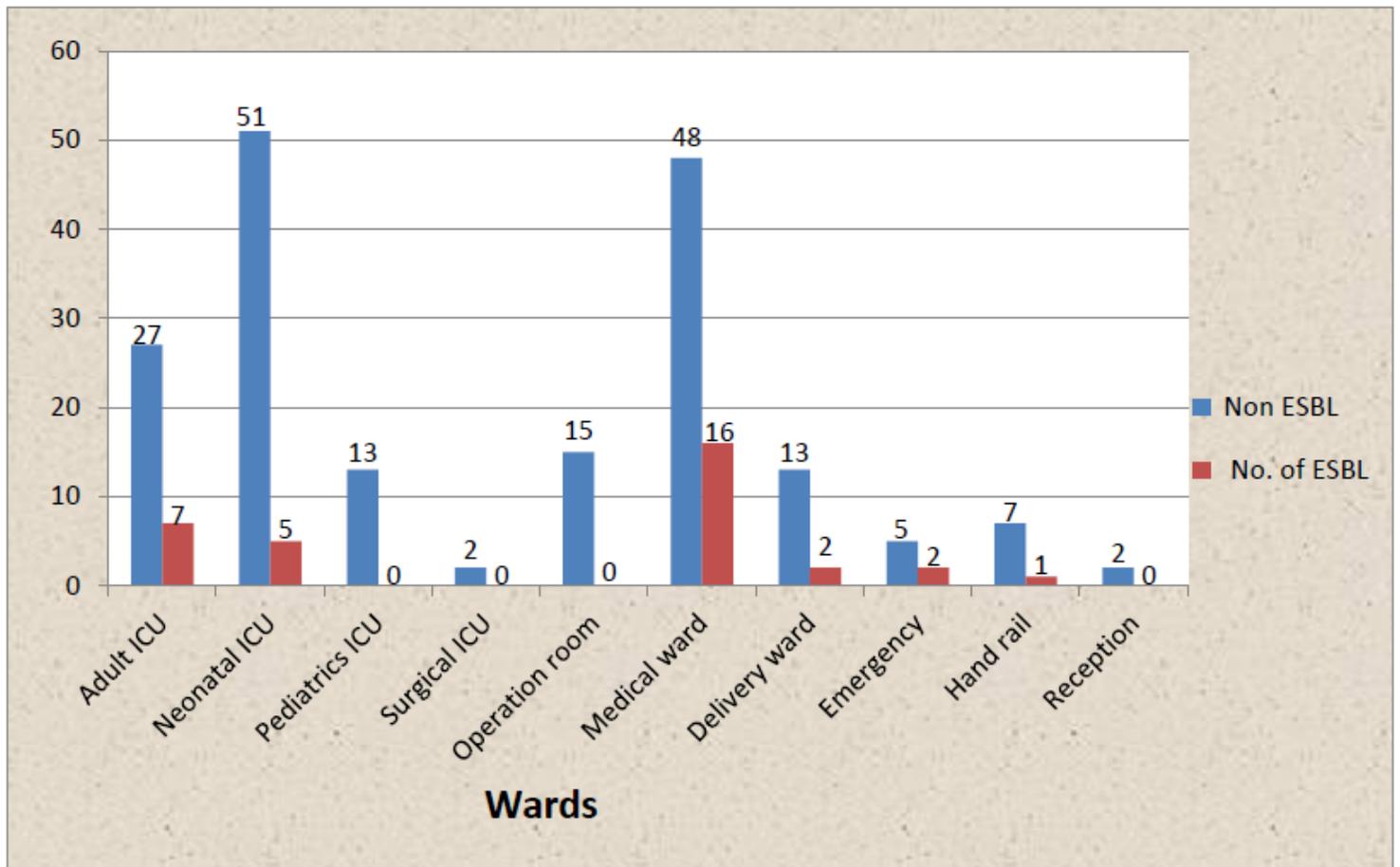
**Figure 1**

Enhancement zones of inhibition by >5mm of discs containing ceftazidime+clavulanic acid and cefotaxime+clavulanic acid, compared with ceftazidime and cefotaxime alone Photograph taken from a representative laboratory work.



**Figure 2**

ESBL- producing gram-negative bacteria with the source of the samples at TASH, 2019.



**Figure 3**

ESBL- producing gram-bacteria stratified by ward specialty of TASH, 2019.