

Six Years Antimicrobial Resistance Trends among Bacterial Isolates in Amhara National Regional State, Ethiopia

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Abstract : Background: Antimicrobial resistance (AMR) is a silent tsunami and one of the top global threats to health care and public health. It is one of the common agendas globally and in Ethiopia. Emerging AMR will be a double burden to Ethiopia, which is facing a series of problems from infectious disease morbidity and mortality. In Ethiopia, although there are attempts to document AMR in healthcare institutions, comprehensive and all-inclusive analysis is still lacking. Thus, this study is aimed to determine trends in AMR from 2016-2021. Methods: A retrospective analysis of secondary data recorded in the Amhara Public Health Institute (APHI) from 2016 to 2021 G.C was conducted. Blood, Urine, Stool, Swabs, Discharge, body effusions, and other Microbiological specimens were collected from each study participants, and Bacteria identification and Resistance tests were done using the standard microbiologic procedure. Data was extracted from excel in August 2022, Trends in AMR were analyzed, and the results were described. In addition, the chi-square (X²) test and binary logistic regression were used, and a P. value < 0.05 was used to determine a significant association. Results: During 6 years period, there were 25143 culture and susceptibility tests. Overall, 265 (46.2%) bacteria were resistant to 2-4 antibiotics, 253 (44.2%) to 5-7 antibiotics, and 56 (9.7%) to ≥8 antibiotics. The gram-negative bacteria were 166 (43.9%), 155 (41.5%), and 55 (14.6%) resistant to 2-4, 5-7, and ≥8 antibiotics, respectively, whereas 99(50.8%), 96(49.2% and 1 (0.5%) of gram-positive bacteria were resistant to 2-4, 5-7 and ≥8 antibiotics respectively. K. pneumonia 3783 (15.67%) and E. coli 3199 (13.25%) were the most commonly isolated bacteria, and the overall prevalence of AMR was 2605 (59.9%), where K. pneumonia 743 (80.24%), E. cloacae 196 (74.81%), A. baumannii 213 (66.56%) being the most common resistant bacteria for antibiotics tested. Except for a slight decline during 2020 (6469 (25.4%)), the overall trend of AMR is rising from year to year, with a peak in 2019 (8480 (33.7%)) and in 2021 (7508 (29.9%)). If left un-intervened, the trend in AMR will increase by 78% of variation from the study period, as explained by the differences in years (R²=0.7799). Ampicillin, Augmentin, ciprofloxacin, cotrimoxazole, tetracycline, and Tobramycin were almost resistant to common bacteria they were tested. Conclusion: AMR is linearly increasing during the last 6 years. If left as it is without appropriate intervention after 15 years (2030 E.C), AMR will increase by 338.7%. A growing number of multi-drug resistant bacteria is an alarm to awake policymakers and those who do have the concern to intervene before it is too late. This calls for a periodic, integrated, and continuous system to determine the prevalence of AMR in commonly used antibiotics.

Keywords : AMR, trend, pattern, MDR

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