

Bacterial Nosocomial Infections and Antimicrobial Susceptibility Pattern among Patients Admitted at Hiwot Fana Specialized University Hospital, Eastern Ethiopia

Moti Tolera

School of Public Health, College of Health and Medical Sciences, Haramaya University, P.O.B: 235, Harar, Ethiopia

Email- motitolera@gmail.com

Abstract

Introduction: A nosocomial infection (NI) (also known as hospital-acquired infection) is a localized or a systemic infection resulting from an adverse reaction to infectious agents or its toxins that develops in 48 hours or more after admission and was not incubating on admission. Most common type of NIs are urinary tract infections (usually catheter associated) (31%) followed by surgical site infections (SSIs) (17%), primary bloodstream infections (BSIs) (usually associated with the use of an intravascular device) (14%), and pneumonia (usually ventilator associated) (13%). Main bacteria associated with NIs are *S. aureus*, coagulase-negative staphylococci (CoNS), *Streptococcus pneumoniae*, *Escherichia coli*, *P. aeruginosa*, *Haemophilus influenzae*, *Klebsiella pneumoniae*, *Acinetobacter*, and *Enterococci*. Transmission within the hospital occurs through cross-contamination of the patients via the contaminated hands of health care staffs who come in frequent contact with patients or through contaminated objects. Emergence of antimicrobial-resistant bacteria has become a public health problem, creating a new burden on modern medical care in hospitals known to cause considerable morbidity and mortality in hospitalized patients. Consequence of the infection caused by resistant bacteria lies in their ability to not only alter the outcome of critically ill patients but also reduce the chances of the treatment, prolong the duration of the hospitalization, increase the cost of health care, and make the spread of infection easier and the prevention more difficult.

Background: Knowledge of proper antimicrobial prescription policy of a particular setting is crucial to optimize the management and reduction of the rate of NIs; however, the investigation of causative agents and their antimicrobial susceptibility profile are an essential prerequisite. In Ethiopia, some comprehensive studies were conducted on NIs; none of these include most of the sources of NIs and have not determined the antimicrobial susceptibility pattern of the causative agents. Moreover, a study reported in one region is not necessarily reflecting the status of other regions. This study was carried out to assess the prevalence and antimicrobial susceptibility pattern of bacteria causing NIs among patients admitted at Hiwot Fana Specialized University Hospital, Eastern Ethiopia.

Method:- A cross-sectional quantitative study involving bacteriological analysis was conducted at Hiwot Fana Specialized University Hospital, Harar, Eastern Ethiopia from March 2017 to July 2017. Harar is the political and administrative town of the Harari Regional State and is located at 525 km from Addis Ababa, Ethiopia. There are six hospitals and eight health centers in this region. Hiwot Fana Specialized University Hospital provides health care services and serve as a referral hospital for eastern parts of our country. It has the largest client load with an average bed occupancy rate of 83% (sources: Hiwot Fana Specialized University Hospital Annual Report of 2016). The hospital consists of six major wards: Medical, Surgical, Obstetrics, Gynecology, Malnutrition, and Pediatric wards. **Study Population.** Patients admitted to the Medical, Surgical, Obstetrics, Gynecology, Malnutrition, and Pediatric wards for more than 48 hours and who had a clinical evidence of NIs were included in this study. **Sample Size and Sampling Technique.** A single population proportion formula was used to calculate a sample size, assuming 95% confidence level, 3% margin of error, 10% predicted nonresponse rate, and 10.3% prevalence of NIs. Final sample size was determined to be 433. The study participants were selected consecutively until the required sample size fulfilled. **2.4. Data and Specimen Collection.** Patients admitted in Medical, Surgical, Obstetrics, Gynecology, Malnutrition, and Pediatric wards were followed prospectively for the development of NIs by the clinicians.

Results: A total of 394 clinically suspected patients for NIs were included in this study. The majority of study participants were females, 223 (56.6%), with a male-to-female ratio of 0.8 :1. The mean age of participants was 23.9 years (± 18.3 standard deviation). A large number of participants were admitted to Obstetrics/ Gynecology (26.1%) followed by Medical ward (25.9%). The majority (86.3%) of patients had no previous history of admission. The length of stay of the patients on the admission was 4–7 days (37.3%) (Table 1). The overall prevalence of culture-confirmed NIs was 6.9% (95% CI: 4.3–7.9). A total of 54 bacterial pathogens were recovered. Of these, 30 (55.6%) were Gram-positive bacteria. The most common bacteria were *S. aureus* (18.5%) followed by *E. coli* (16.7%) and *S. pneumoniae* (14.8%). Surgical sites were most frequently infected (31.5%) followed by the bloodstream (25.9%). *S. aureus* (29.4%), *P. aeruginosa* (17.6%), and CoNS (17.6%) were the most

Extended Abstract

common types of pathogen isolated from surgical sites, while *E. coli* (36.3%), *Proteus spp.* (18.2%), and *Enterococcus spp.* (18.2%) were from urinary tract. *S. pneumoniae* (41.6%) and *Klebsiella spp.* (25%) were the top two pathogens isolated from the upper respiratory tract. The most frequently isolated bacteria from the bloodstream were *S. aureus* (28.6%), *E. coli* (21.4%), and *S. pneumoniae* (21.4%)

Biography:

Moti Tolera is working as a faculty member in School of Public Health, College of Health and Medical Sciences, Haramaya University, P.O.B: 235, Harar, Ethiopia.

This work is partly presented at 3rd Annual Congress & Medicare Expo on Primary Healthcare, Clinical & Medical Case Reports, April 17-19, 2017 Dubai, UAE