



A Comparative Study of Microbial Load in Government, Private and Charitable Hospitals in Akola City

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ABSTRACT

The study was carried out in hospitals of Akola city. Microorganisms have great importance due to their disease producing ability. Through different routes they infect the host to form disease condition. As we go through the history it is noticed that hospitals have always been reported as a source of infection to the admitted patients. In all a total of 646 samples were collected from different sources in the hospitals of Akola. Total number of isolates obtained from government, private and charitable hospital were different. The important pathogenic isolates associated with infections were *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa*, which were observed in higher percentage from all hospitals, while *Enterococcus faecalis*, *Enterobacter* sp., and *Klebsiella pneumoniae* were observed in less percentage as compared to others.

INTRODUCTION

Microorganisms are found everywhere in the environment and body. They are present in all the environmental compartments such as air water and soil. Many of these organisms are harmless or beneficial, but some are responsible for diseases in humans. Hospitals particularly where most unhygienic conditions prevail and patients with variety of diseases are admitted result in occurrence of bacterial pathogens. Hospital acquired infections are adverse patient events from which approximately 2 million people suffer annually (Vaidya et al. 2007). Nosocomial comes from the Greek word *nosokomeio* meaning hospital (*nosos* = disease, *komeo* = to take care of). This type of infection is also known as a hospital-acquired infection (or, in generic terms, healthcare-associated infection). Nosocomial infections are commonly transmitted when hospital officials become complacent and personnel do not practice correct hygiene regularly (http://en.wikipedia.org/wiki/Nosocomial_infection). A hospital is a place for treatment of infections of various kinds to restore the sick and injured to healthy in the shortest possible time so as to ensure that they return to normal life routine. However, hospitals by themselves become a source of infections. This phenomenon of nosocomial infection is worldwide and almost impossible to eradicate. All hospitalized patients are susceptible but who are at greater risk than others are the young children and the elderly persons with compromised immune system, long hospital stay, use of indwelling catheters, failure of healthcare workers to wash their hands. According to the US National Nosocomial Survey for 2002, such infections lead to 75,000 deaths in the US on

an average in a year. No hospital has zero infection rate. Infections are prevalent in every single medical practice, from a small dispensary to a large hospital. The question is whether hospitals have any kind of verifiable clinical surveillance to monitor infection rates.

MATERIALS AND METHODS

The clinical isolates which include bacterial pathogens were collected from various places such as bed, table, floor, dressings, air and swabs from catheter in different hospitals. Isolation and identification were done as per standard methods (Ananthnarayan & Panikar 2000, Cruickshank et al. 1975). On the basis of their cultural, morphological and biochemical characteristics the samples containing pathogenic bacteria were isolated and identified.

RESULTS AND DISCUSSION

Results of present study are confined to the samples isolated from different sources in the hospitals of Akola. In all, a total of 646 samples were collected from different hospitals. Total number of isolates obtained from government, private and charitable hospital are shown in Table 1.

Percentage of different pathogens found in various hospitals is shown in Fig 1. *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa* were observed in higher percentage from all hospitals while *Enterococcus faecalis*, *Enterobacter* sp. and *Klebsiella pneumoniae* were observed in less percentage as compared to them. In government hospital *S. aureus* and *E. coli* were observed in higher percentage than private and charitable hospitals. In private and chari-

Table 1: Number of isolates obtained from government, private and charitable hospitals.

	<i>S. aureus</i>	<i>E. coli</i>	<i>P. aeruginosa</i>	<i>E. faecalis</i>	<i>K. pneumoniae</i>	<i>Enterobacter</i> sp.
Government Hospital	87	69	39	17	10	14
Private Hospital	50	45	38	11	4	12
Charitable Hospital	50	35	36	17	6	8

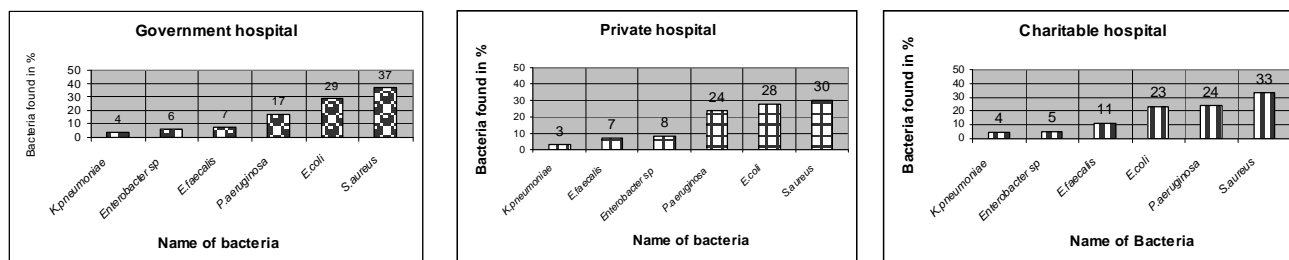


Fig. 1: Percentage of different pathogens found in various hospitals.

table hospitals higher percentage of *P. aeruginosa* was observed than government hospitals. In charitable hospitals higher percentage of *E. faecalis* was observed. In our analysis, we focused on the bacteria most frequently encountered in hospitals. These species are the most important nosocomial pathogens in most parts of the world in terms of virulence (Emori & Gaynes 1993). These strains of pathogenic bacteria deserve special attention because of development of drug resistance. The data from the National Nosocomial Infection Surveillance (NNIS) System from 1986 to 1990 reported *E. coli* (13.7%), *Staphylococcus aureus* (11.2%), Enterococci (10.7%) and *Pseudomonas aeruginosa* (10.1%). These data show that *Staphylococcus aureus* remains important pathogen and that the distribution of pathogens differ by site and hospital location (Schaberg 2009).

Ananthnarayan & Panikar (2000) marked hospitals as a source of infections to patients admitted. He further reported incidences of hospital infection to the extent of 2-12 % even in the advanced countries which is much higher in the crowded hospitals in the developing countries. According to him hospital infections are typically exogenous, the source being any part of the hospital system, people, inanimate object, food, water and air in the hospital. These findings correlate with the present study.

In the United States, the Center for Disease Control and Prevention estimated that roughly 1.7 million hospital-associated infections from all types of microorganisms including bacteria, combined, cause or contribute to 99,000 deaths each year. In Europe, where hospital surveys have been conducted, the category of Gram-negative infections

are estimated to account for two-thirds of the 25,000 deaths each year. Nosocomial infections can cause severe pneumonia and infections of the urinary tract, blood stream and other parts of the body. Many types are difficult to be attacked with antibiotics, and antibiotic resistance is spreading to Gram-negative bacteria that can infect people outside the hospital (Pollack 2010). Assuming that the national average for nosocomial infections in India anywhere near the estimates based on limited reports of 30% of hospital admissions, Indian healthcare scene is facing an enormous challenge in terms of the need to prevent and control, if not eradicate such infections. This study may be helpful for improvement of hospital conditions.

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