Hospital acquired infection: The Nosocomial infections and community acquired infection in a medical college hospital.

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ABS TRACT

BACKGROUND

Hospital-acquired infections, also known as healthcare-associated infections (HAI), increases morbidity and mortality. A study was done in a medical college hospitalto reveal trends over time and help to identify the risk factors.

MATERIALS AND METHODS

A study was conducted in Gauri Devi institute of medical sciences and hospital, from August 2020 to August 2021. Data were prospectively recorded from all in patients at the Medical College except those treated in the pediatric, psychosomatic, and psychiatric services. The data were collected systematically by chart review and by interviews with the medical staff. The classification of infections were according to the definitions of the Centers for Disease Control and Prevention (CDC). patients were recorded for underlying diseases, invasive procedures, the use of antibiotics, medical devices (the application of specific medical techniques such as drainage, vascular catheters, etc.), and detected pathogens.

RESULTS

Out of 1050 patients studied, 118 (11.2%) had a total of 125 nosocomial infections, while 112 (10.7%) had 122 community-acquired infections. The most common NI were surgical site infections (28.5%), infections of the gastrointestinal tract (26.1%) and respiratory tract (19%), urinary tract infections (16%), and primary sepsis (4%). The most common pathogens were Escherichia coli, coagulase-negative staphylococci, Candida spp., Enterococcus spp., and Pseudomonas aeruginosa. The other risk factors included age, previous hospital stay, trauma, stay on an intensive care unit, and artificial ventilation.

CONCLUSIONS

In this study, nosocomial infection were a common complication in all hospital whether it is in a developed or developing. In our hospital , surgical site infections were the most common type of nosocomial infection because of the large number of patients that undergoes surgical procedures in our hospital. More investigation will be needed to assess the benefit of studies for optimizing appropriate, effective preventive measures.

KEYWORDS

HAI (Hospital Aquired Infections), BSI (Bloodstream Infection), ICU (Intensive Care Unit), NI (Nosocomial Infection)

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How to Cite This Article:
Smita D, Sana Nora A, Amita G. Hospital acquired infection: The Nosocomial infections and community acquired infection in a medical college hospital. J Evid Based Med Healthc 2021;9(01):15. DOI:10.18410/jebmh/2021/1

Submission 06-12-2021,
Peer Review 13-10-2020,
Acceptance 20-12-2021,
Published 27-12-2021.

INTRODUCTION

Hospital acquired infection also called as Nosocomial infection or Healthcare Associated Infections (HAI) is defined as an infections acquired by the patients who where admitted to the hospital for a reason other than the infection but somehow get infected. An infection acquired by the patient in a hospital or other health care department in whom the infection was not present or incubating at the time of admission. This also include infections acquired in the hospital during healthcare delivery for other diseases and after discharge[1]. These infections are usually acquired after hospitalization and manifest 48 hours after admission to the hospital, 3 days of discharge or 30 days of an operation and can affect 1 in 10 patients admitted in hospital. The infections are monitored closely by agencies such as the National Healthcare Safety Network (NHSN) of the Center for Disease Control and Prevention (CDC)[2]. Some of the invasive devices such as catheters and ventilators which are employed in modern healthcare are associated to HAI[3]. HAI infections include Central Line-Associated Bloodstream Infections (CLABSI), Catheter-Associated Urinary Tract Infections (CAUTI), Surgical Site Infections (SSI), Hospital-Acquired Pneumonia (HAP), Ventilator-Associated Pneumonia (VAP), and Clostridium Difficile Infections (CDI)[4].

For the last few decades, it has been taken seriously by the hospitals to look at the HAI. Now a days, many of the hospitals have established infection tracking and surveillance systems in place, along with strong and healthy prevention strategies to reduce the rate of hospital-acquired infections. The influence of hospital-acquired infections is seen not just at an individual patient level, but also at the community level as they have been linked to multidrug-resistant infections. For the minimization of these infection one should look at both for identifying patients with risk factors for hospital-acquired infections and multidrug-resistant infections[2].

In developed or developing countries, hospitalized patients can acquire one of the healthcare associated infections[5]. Intensive Care Units (ICU) have the highest prevalence of hospital acquired infections in the hospital setting. Also patients in burn units, undergoing organ transplant and neonates. Because of the use of mechanical ventilation, invasive procedures and their immunocompromised status ICU patients are at higher risk of getting infected. The major cause of nosocomial infections are: A) Antimicrobial use, leads to the development of resistant strains of pathogens. B) Clemency by the hospital staff for taking or using outside things by patients and to infection control committee in maintaining sterility conditions. C) due to low immunity and unhygienic conditions around the patients.

As infection increases , there is an increase in prolonged hospital stay, long term disability, increased antimicrobial resistance, increase in socio-economic disturbance, and increased mortality rate.

Material and Methods

A study was conducted in Gauri devi institute of medical sciences and hospital, from August 2020 to August 2021. 1050 patients were assessed for nosocomial infection. The classification of infection was, according to the definitions of the Centers for Disease Control and Prevention (CDC) [6]. A disease is defined as nosocomial if the first signs of infection occurred more than 48 hours after admission. Patients specific parameters are recorded from the day of admission. Demographic data, underlying diseases, invasive interventions, recent hospital admissions, and antibiotic treatment were some of the parameters that are recorded.

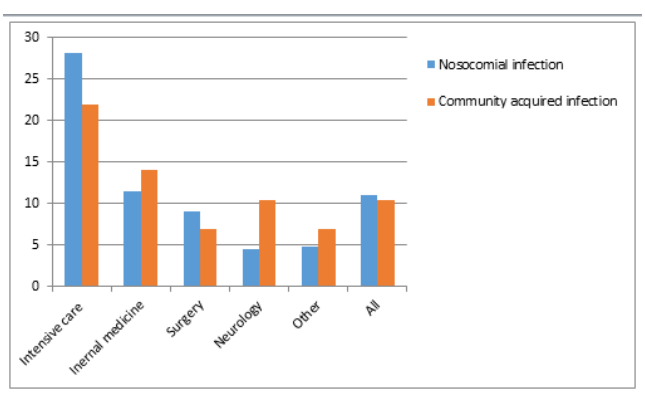
For every individual patient, all investigations and examinations, results, and notes written by nurses and physicians were recorded accordingly. On the day of the patient's inclusion in the survey in order to ensure full data were obtained on the health and infection status of each patient, the nursing and medical staff were interviewed.

In this study protocol following data of each patient were recorded: reason for admission, demographic data, underlying diseases, use of certain medical devices (e.g., urinary catheters, gastric and other tubes, vascular catheters, and drains), operation, recent hospital admission and antibiotic treatment. Each day trained staffs of the infection control team recorded the data for the patients of three different wards. All infections were then classified exclusively by two trained staffs of the infection control team.

Results

1050 patients were assessed for NI out of which a total of 247 infections were found in 226 patients , overall prevalence 22%. This included 112 patients (10.7%) with 122 community-acquired infections (CAI). There were 117 patients (11.2%) with 125 NI. The highest prevalence was found in intensive care units (NI 28.2%), followed by internal medicine wards (NI 11.4%) and surgery (NI 9.1%). Only in intensive care units and on surgical wards was the prevalence of NI higher than that of CAI (table1).

SL.NO.	NOSOCOMIAL INFECTION (%)	COMMUNITY ACQUIRED INFECTION(%)
1. Intensive care unit(n=110)	28.20%	20.20%
2. Internal medicine(n=273)	11.40%	14.50%
3. Surgery(552)	9.10%	6.80%
4. Neurology(75)	4.20%	10.50%
5. Other(n=40)	4.90%	7.70%



The most frequently distributed infections in a hospital are shown in table 2. The paramount CAI were pneumonia (n = 28) and infections of the gastrointestinal tract (n = 25).

TYPE OF INFECTION	NUMBER % (n= 247)
Nosocomial Infection	125
Surgical site infection	37
Gastrointestinal infection	32
Pneumonia	24
Urinary tract infection	20
Primary sepsis	5
Other nosocomial infection	7
Community acquaired infection	122
Pneumonia	28
Gastrointestinal infection	25
Skin and soft tissue infection	22
Urinary tract infection	11
Other infection of male & female genital organ	7
Other community acquired infection	29

DISCUSSION

One in every five patients (22%) in this prevalence study was found to have an infection. Nosocomial infections and community-acquired infections (CAI) were found in similar frequency (11.2% versus 10.7%).The multicenter study conducted by Emmerson et al. in 1994 described a similar overall prevalence (23.7%), but there were notably more CAI than NI (14.7% versus 9%)[7].

In this study, the most frequently detected type of NI were surgical site infection. A prevalence studies by Ilic et al. and Fitzpatrick et al. found that surgical site infections were the most frequent NI[8,9].

The group of NI next to surgical infection in our survey were gastrointestinal infections, predominantly infectious gastroenteritis. Emmerson et al. found an increase in the prevalence of such infections from 0.13% in 1980 to 0.51% in 1993[10]. Gastrointestinal infections were the third most frequent group in a study of the prevalence of NI conducted in Scotland in 2005 and 2006[11].

Other studies identified isolated urinary catheters, vascular catheters, and invasive ventilation as independent risk factors[12-15]. When one also considers that UTI, pneumonia, surgical site infections, and primary sepsis account on average for 80% of the NI in the publications listed[15-17], it seems plain that prevention of device-associated infections is highly important.

CONCLUSION

In this study, surgical site infections were the most common type of nosocomial infection because of the large number of patients that undergoes surgical procedures in our hospital. More investigation will be needed to assess the benefit of studies for optimizing appropriate, effective preventive measures.

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