Original Research Article

Hospital Acquired Infection in India – A Meta-Analysis

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Abstract

Aim: Present study was carried out to find out the prevalence of hospital acquired infection.
Material and Methods: Standard protocol for systematic literature review from published data from different authors on hospital acquired infection was studied and analysed. Latest data were included in present study.
Duration of research: Present research was carried out at department of microbiology integral institute of medical sciences & research Integral University dasauli, kursi road, lucknow from 15/01/2022 to 15/07/2022.
Results: During the study period, the hospital acquired infection rate was 33.33% moreover developing country is having high prevalence of the infection.
Conclusion: Hospital acquired infection is a major risk for the person specially with low immune response and for elders. One must take preventive care while visiting to hospital for treatment or to visit any patient being treated in hospital.

Keywords: Nosocomial Infections, Hospital-Acquired Infections, Healthcare Safety

1. Introduction

According to the Centres for Disease Control and Prevention (CDC), community acquired infections are those present or incubating at the time of hospital admission. Hospital acquired infections that is also referred as nosocomial infections that are infections that are frequently absent or may be incubating at the time of admission of a person to hospital. These infections develop 48hr after admission to hospital. Organizations like the National Healthcare Safety Network (NHSN) of the Centre for Disease Control (CDC) and Prevention keep a close eye on the infections [1,2].

The criteria of pneumonia have been modified in accordance with recommendations from the American Thoracic Society (ATS) and the Infectious Disease Society of America (IDSA)

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in order to identify patients more accurately at risk for multidrug-resistant (MDR) bacteria. The goal of this is to prevent the overuse of antibiotics. Before, the term "healthcare-acquired pneumonia," or HCAP, was frequently used. HCAP has been replaced with the term "Hospital-acquired Pneumonia," or HAP. According to the IDSA guidelines, "pneumonia that occurs 48 hours or more after admission to the hospital and did not appear to be incubating at the time of admission" is what is meant by "hospital-acquired pneumonia." [3] According to IDSA, "pneumonia that develops greater than 48 to 72 hours following endotracheal intubation is designated as ventilator-associated pneumonia, or VAP."[4]

The number of infections in the intensive care unit is significant and causes major medical issues. Nosocomial infections, originally described as infections occurring after 48 hours of hospital admission, are commonly used to describe illnesses acquired during the hospital stay. [5,6] Infections Nosocomiales Nationwide The term "nosocomial infection" refers to a localised or systemic illness brought on by an immune response to the presence of an infectious agent (s) or its toxin (s) that were absent

or dormant at the time of the patient's admission to the hospital [5]. These infections are opportunistic, and hospital patients with compromised immune systems can develop illness from bacteria with low pathogenicity. Antimicrobial resistance grows as a result, leading to a rise in morbidity and death under such circumstances. Most nosocomial infections are external, with any component of the hospital ecosystem, including people, objects, food, water, and air in the hospital [7]. Antimicrobial peptides (AMPs) can kill bacterial pathogens isolated from urinary tract infection; hospital acquired infection. These peptides are effective against bacterial pathogens that are becoming resistance towards existing antibiotics hence can be alternative to antibiotic. Moreover, they do not cause any side effect to the consumer [8]. Production of such bioactive peptides can be enhanced in during in-vitro production [9-11].

2. Material and Methods

Present research was carried out at department of microbiology integral institute of medical sciences & research Integral University dasauli, kursi road, lucknow from 15/01/2022 to 15/07/2022. Standard protocol for systematic literature review from published data from different authors on hospital acquired infection was studied and analysed. Latest data were included in present study.

Source of literature

This was drawn from published indexed literature in the electronic bibliographic databases.

Search terms

Search terms was applied with various Boolean operators for three core concepts: Hospital acquired infection (HAI); HAI in India; prevalence of HAI.

Inclusion and exclusion criteria

The eligibility of studies related to our study was included, reviewed, and assessed for further study while other was excluded based on the availability of studies.

Study selection, data extraction and analysis

During present study different databases were used for collection of data while duplicated citations were removed. Screening was done based on exclusion and inclusion criteria. Thus data collected were analysed. Microsoft Excel spreadsheet for extraction of data items of: type of pathogens, patient outcome and antimicrobial susceptibility pattern were seen.

Results

S.No	Authors	Year	Country	Study finding
1.	Maumita D, Dipanshu M.	2018	West Bengal	Hospital acquired infections had an incidence rate of 19.6% and a density of 26.35 per 1000 patient days, according to the study. The most frequent kind of infection was surgical site infection (57.2%), followed by UTI (23.8%) and bloodstream infection (19 %) Pseudomonas and Klebsiella were the two bacteria that were most often discovered. The study's main finding was that the hospital acquired infection rate could not be reduced to less than 10% in tertiary healthcare facilities. Therefore, the installation of strict HAI prevention standards as well as ongoing surveillance and monitoring systems can aid in the future reduction of this issue.
2.	Narendranath V et al.	2017	India	Researchers report that UTI-1318 (1.66%) is more common in females than other forms of HAI overall and has the greatest prevalence in general ward (51.7%). BSI-360 (0.45 percent) had 54 percent male patients, 79.7 percent diagnoses that were medical in nature, and 66.9 percent of cases were from intensive care units. According to a mortality study, the greatest number of fatalities was caused by BSI, which was responsible for a case fatality rate of 27.22 percent and a proportionate mortality rate of 60.12 percent. The study's conclusion was that tertiary care facilities need a multi-pronged approach to combat these diseases. HAIs increase hospital stays, cause long-term impairment, and place a financial burden on the family. Many times, illnesses related to healthcare can be avoided by employing
3.	Yatin M et al	2014	India	The researchers' methods for preventing infection include identifying patients who are at risk for nosocomial infections, practising good hand hygiene, adhering to protocol to prevent transmission, and developing plans to lower the incidence of pneumonia caused by ventilators, catheters, and urinary tract infections, among other things. For the purpose of estimating the risk of infections, the post-transplant timeline is divided into three

				time periods. Special attention must be paid to cleaning and decontaminating the room's ventilation system, wearing protective gear, and handling food with care.
4.	Christine Boev et al.	2017	New York	CDC classifies complications or infections resulting from surgical procedures or the implantation of medical devices as HAIs. The CDC specifically keeps an eye on pneumonias linked to ventilators, and surgical site infections. The aetiology, epidemiology, and prevention of HAIs are covered in this article, as well as how nurses may collaborate with other medical professionals to reduce the frequency of these avoidable problems.
5.	Velu Nair et al.	2014	Pune	Each patient's information was gathered utilising a standardised data input form. Patients with HAI were identified and given a diagnosis using Centers for Disease Control and Prevention standards. The outcome of this research was 3.76 percent of people had HAI overall. This study's result was that HAI prevalence gradually decreased across several survey cycles. All parties involved must make a conscious effort to shorten hospital stays. Medical gadgets should only be used sparingly and carefully.
6.	Babcock H.et al	2003	Midwestern united states	Between hospitals and between various intensive care units (ICUs) within hospitals, microbiologic data were compared. The outcome of this research was Reviewable culture data were available for 753 ventilator-associated pneumonia occurrences. In all hospitals, Staphylococcus aureus and Pseudomonas aeruginosa were the most prevalent microorganisms (25.2 percent). Escherichia coli (9.5 percent vs 2.3 percent; P .001) and Klebsiella pneumoniae (13 percent vs 3.1 percent; P .001) were more prevalent in the paediatric hospital than in the adult hospitals. Pediatric ICU rates in the paediatric hospital were greater than neonatal ICU rates (33.3 percent vs. 17 percent; P =.01). The surgical ICU in the adult hospitals showed higher Acinetobacter baumannii rates than the other ICUs (10.2 percent vs. 1.7 percent; P .001). Ventilator-associated pneumonia has different microbiologic causes in different institutions. Understanding these variations can help with initial antibiotic regimen selection, which may reduce mortality.
7.	Zeina A Kanafani et al.	2003	Lebanon America	In accordance with the study's findings, 70 patients participated. The prevalence of VAP was 47%. Of all isolates, gram-negative bacilli made up 83 percent. Pseudomonas aeruginosa and Acinetobacter anitratus were the two most frequent organisms found. Out of all gram-negative isolates 50% were found antibiotic resistant. The study's result findings from this referral centre in Lebanon show a greater frequency of VAP and a significant prevalence of resistant microorganisms when compared to previous research.
8.	Siyi He et.al	2014	China	According to the findings of this study, the prevalence was 6.37 percent overall and 35.2% among patients who had been receiving mechanical ventilation for more than 48 hours. The average detection rate for the isolated pathogens was 23.19 percent for Pseudomonas aeruginosa, 20.15 percent for Staphylococcus aureus, 19.53 percent for Haemophilus influenzae, 10.68 percent for Acinetobacter baumannii, 10.18 percent for Escherichia coli, 10.18 percent for Klebsiella pneumoniae, and 9.52 percent for Candida albicans (7.20 percent). Also examined were risk variables. The study's findings indicate that VAP is frequent.
9.	Harika B et.al	2018	India	A recent study discovered 143 strains of Acinetobacter, 126 of which (88.1%) were incredibly drug resistant. In India, there are little reliable and consistent surveillance data on infections related to healthcare.

Discussions

Different workers carried out research on hospital acquired infections. Each hospital situated in different geographical region favour growth of different microorganisms. The pattern and methods used for cleaning and frequency of cleaning/sanitization favours the growth of microorganisms. A general state of cleanliness must be maintained throughout the hospital or health-care institution using general principles of sanitation, disinfection, and sterilization. Each area, from the trash disposal area to the operating rooms,

must be thoroughly disinfected. During the study period, the hospital acquired infection rate was 33.33% moreover developing country is having high prevalence of the infection.

Conclusion

From the above and the researcher's clinical experience the researcher thought to do this meta-analysis on "Hospital acquired infection in India". Thereby trying to understand the latest evidence on hospital acquired infection in India. This will further help in developing better hospital practices and policies to prevent and manage HAI. Hospital acquired infection is a major risk for the person specially with low immune response and for elders. One must take preventive care while visiting to hospital for treatment or to visit any patient being treated in hospital.

Conflict of Interest: Nil

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