

FREQUENCY OF HOSPITAL-ACQUIRED INFECTIONS IN ISFANDYAR BUKHARI DISTRICT HOSPITAL ATTOCK

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ABSTRACT

Objective: to ascertain the incidence of hospital-acquired infections at the IBD Hospital, Attock's surgical departments.

Study Design: a prospective cross-sectional study.

Place and study duration: IBD Hospital, Attock, from March 2016 to March 2017.

Methodology: The research comprised 10,238 patients, both sexes, aged 5 to 60, who had wound infections within a month after different surgical operations. Pus was collected and moved, and conventional methods were used for the microbiological tests. Participants in the trial were not allowed to have any co-morbid conditions, such as diabetes, liver disease, TB, or any known pre-operative infection, or to have had surgery for cancer. We looked for several kinds of infections in the patient's culture results.

Result: Twelve male and ten female patients, or 22 out of 10238, satisfied the criteria for nosocomial infection. The most frequently isolated organism was *Staphylococcus aureus* (35.5%), which was followed by *E. coli* (24%), *pseudomonads* (14.8%), and *Klebsiella* (6.5%).

Conclusion: *Staphylococcus aureus* is the most frequent pathogen that causes nosocomial infections (at the surgical site), followed by *Pseudomonas* and *E. coli*.

Keyword: Nosocomial infection, *Staphylococcus aureus*, *E. coli*, *Pseudomonas*, *Klebsiella*.

INTRODUCTION

Instead, it is frequently referred to as a Health Care-associated infection (HAI or HCAI) to highlight hospital and nonhospital settings. An infection of this kind might be acquired by various mechanisms in a hospital, nursing home, rehabilitation center, outpatient clinic, or other clinical settings.

Infection may also be transferred by healthcare personnel via contaminated bed linens, equipment, or air droplets. The infection may have come from the patient's skin microbiota, another patient's illness, or staff members who may have been exposed to the

virus, or in some situations, the infection may have started as a result of the patient undergoing surgery or other operations that compromised the skin's protective layer¹.

Even if the patient may have gotten the infection from their skin, it is still regarded as nosocomial when it occurs in a medical environment².

The Centers for Disease Control and Prevention estimates that around 1.7 million hospital-associated infections each year in the United States result from all kinds of microorganisms, including fungus and bacteria combined, and cause or contribute to 99,000 fatalities. According to hospital studies carried out in Europe, two-thirds of the 25,000 annual fatalities in that region are thought to be related to Gram-negative infections³.

Severe pneumonia and infections of the urinary tract, bloodstream, and other body areas may be brought on by nosocomial infections. Antibiotics are

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only sometimes effective in treating many kinds. Furthermore, therapeutic complications may arise from antibiotic resistance ⁴.

Many infections were seen during the trial, including post-operative wound infection, hospital-acquired pneumonia, urinary tract infection, gastroenteritis, and purpura fever.

By identifying the different microorganisms implicated in nosocomial infections, this research may facilitate the development of empirical therapeutics by facilitating the easy determination of medication sensitivity to these bacteria. Early use of these therapies may enhance the patient’s well-being and prevent issues. By identifying microorganisms and related risk factors, surgeons may more effectively rule out the causes of infections and offer patients higher-quality surgical treatment. In the long term, this may also aid in controlling the infections and lowering their occurrence.

MATERIAL AND METHODS

This descriptive cross-sectional research was conducted between April 1, 2016, and April 15, 2017. This research was conducted at the IBD Hospital Attack in Pakistan in the surgery, urology, and gynecology departments. The IBD Hospital Attack serves patients from lower-middle socioeconomic classes. Patients who had secondary wound infections within a month after surgery in the surgical departments were included.

The criteria for diagnosing wound infection were the development of fever, discomfort at the surgical site, moist dressing, and the subsequent emergence of frank pus from the wound site—typically within 5-7 days. Patients in the age range of 5 to 60 years, regardless of gender, who had a nosocomial infection after laparotomy, appendectomy, mastectomy, cholecystectomy, debridement, hemorrhoidectomy, hernia repair, or colorectal surgery were included.

Pus swabs were taken from the patient’s affected areas using accepted methods. The pathology department received these specimens. Following their inoculation on blood and McConkey’s agar and 37CO incubation, the bacterial pathogens were identified using standard microbiological techniques and conventional biochemical procedures. Additionally, patient files were reviewed, and all pertinent data was entered into the structured Performa of my research.

The research excluded any patient who had co-morbid conditions such as diabetes, liver illness, TB, or who had undergone surgery for cancer or any other condition when an infection had been identified

Table 1: Nosocomial infections recorded during March 2016 to March 2017

Months	No. of patients	No. of Nosocomial infections	NCI rate
March	800	1	.12
April	81	3	.37
May	946	4	.42
June	829	3	.36
July	925	0	0
August	1087	1	.09
September	776	1	.12
October	891	1	.11
November	798	1	.12
December	856	0	0
January	433	2	.46
February	860	3	.34
March	956	2	.20

Table 2: Distribution of SSI Pathogens in IBD Hospital Attack

S. No.	Pathogens	Percentage
1	Staphylococcus aureus	32.7%
2	E.Coli	23.6%
3	Pseudomonas aeruginosa	17%
4	Klebsiella Pneumonia	6.6%
5	Acinetobacter	6.3%
6	Proteins Species	1.1%
7	Eintero bacter	0.8%
8	Streptoacus pyogenes	2.2 %
9	Candida albicans	1.6%
10	Moraxella	1.1%
11	Diphtheria	0.5%
12	Providencia stuartii	0.3%

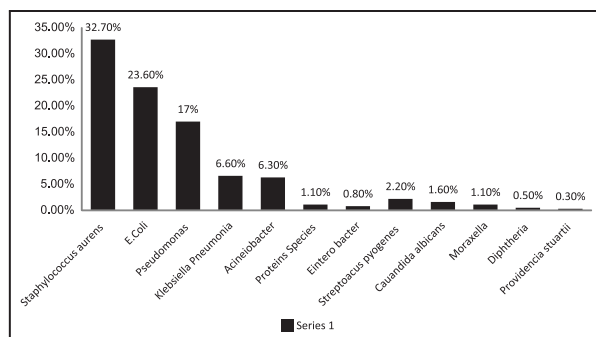


Figure 1: Graphical Presentation of the pathogens isolated

even before the procedure.

RESULT

Ten thousand two hundred thirty-eight surgical department patients from IBD Hospital, Attock, were included in the research; 6,490 were male, and 3,748 were female. Participants in the research had an average age of 32.84 ± 11.76 years. The nosocomial infection rate was 0.21%, affecting just 22 patients.

DISCUSSION

Nosocomial infection, a common problem faced worldwide, has increased the morbidity and mortality of patients. These infections have also burdened the country's reserves due to the mounting expenditures required in their management and treatment. These infections involve a pattern of pathogens.

They endanger the patients' lives and make surgery more difficult⁵. The most common pathogen found in my study was *Staphylococcus aureus* (35.5%), which was in line with research done in Karachi by Mahmood A: nosocomial infection national surveillance service (NINSS) survey (1997-2001) and one-year surveillance conducted in Isfahan, Iran also revealed *Staphylococcus aureus* (MRSA) 00 as the most common nosocomial infection.

On the other hand, 15 MRSA cases were identified throughout my investigation. Compared to methicillin-susceptible *Staphylococcus aureus*⁶, patients with MRSA had higher mortality, longer hospital stays, and higher healthcare expenditures, according to Engemann JJ.

Additionally, my research revealed that E-coil (24%) is the second most frequent pathogen implicated with nosocomial infections. The outcome differed from what Erum Are discovered in Karachi, where they ranked E-coil as the most prevalent pathogen involved⁷ and staphylococcus as the third most frequent infection.

The research above also identified *Pseudomonas aeruginosa* (14.8%) and *Klebsiella pneumonia* (6.5%) as significant pathogens. Additionally, 1% of fungal nosocomial infections were discovered, the majority of which are identified in transplant patients. Except for individuals with diphtheria and one case with *Providencia stuartii*⁸ infection, my findings were comparable to those isolated in previous investigations

¹⁰. 238 patients from the surgical department of IBD Hospital Attock were included in my study, 6,490 of whom were male and 3,748 female.

This demonstrated that a greater percentage of male patients had nosocomial infections, consistent with the literature findings. This may be related to the kinds of wounds received and the potential that men were more likely to get these infections⁹. The information and proof show the present pathogen pattern in patients hospitalized at IBD Hospital in Attock, Pakistan, due to nosocomial infections. When the most prevalent pathogen causing the wound is identified, this may assist in modifying empirical therapy to address the infection better while a laboratory diagnosis is still being made.

Empirical treatment administered promptly and accurately may reduce problems and relieve hospital and patient workloads. By enhancing sterilizing processes and procedures, the source of the infections may be found once they are discovered, helping to avoid them¹⁰. My research aimed to ascertain the relative frequency of various pathogen species in nosocomial infections.

My research's shortcoming is that it doesn't examine the risk variables, even if etiological factors are connected to certain surgical operation kinds. Furthermore, there were variations in the surgical techniques and the surgical settings and units. In our context, cross-sectional analytical studies are advised to investigate these associations, as they may aid in the discovery of plausible etiological variables relevant to our Pakistani community.

These can provide vital information that can play a role in recommendations regarding preventing nosocomial infections¹¹.

CONCLUSION

The most frequent causal organism in this investigation, identified in 22 patients (35.5%) of cases, was *Staphylococcus aureus*, followed by E. Coli (24%) and *Pseudomonas aeruginosa* (14.8%). This displays the current status of the pathogens that cause nosocomial infections.

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