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PREVALENCE, RISK FACTORS, OUTCOMES & MANAGEMENT OF NOSOCOMIAL INFECTIONS IN INTENSIVE CARE UNITS OF PUBLIC AND PRIVATE SECTOR HOSPITALS OF LAHORE, PAKISTAN.

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ABSTRACT

Objective: The main objective of this study was to evaluate the prevalence, risk factors, outcomes, management of nosocomial infections in intensive care units of both the public and private health sector hospitals of Lahore, Pakistan. **Material & Method:** An observational study was conducted on 100 subjects in duration of two months. Data collection form was designed and filled for analyzing prevalence, risk factors, outcomes and management of nosocomial infection in intensive care units. The forms were evaluated and analyzed the data was calculated in %ages and the results were shown in the form of graphs depicting comparison between the two mentioned sectors. **Results:** The age of majority of the patients lied within a range of 41-50 years. The prevalence of nosocomial infection was more in public sector than private. The most susceptible population for acquiring nosocomial infection were either immune compromised patients or children/aged people. The major outcomes of nosocomial infection was found to be increased length of hospital stay and as a result increase in treatment cost. In both the private and public sectors, the guidelines for nosocomial infection prevention and management existed but there was no surveillance program in both the sectors. Unfortunately, there was no monitoring of nosocomial infection in both the sectors. **Conclusion:** From the study it was concluded that nosocomial infection in intensive care units is prevalent in both the sectors, the risk factors affect the patient's health and financial conditions, but there is no monitoring program for its prevention in majority of the hospitals while the guidelines exist for its management.

KEYWORDS: nosocomial infection, prevalence, susceptible, prevention.

INTRODUCTION

The term "nosocomial" comes from two Greek words: "nosus" meaning "disease" and "komeion" meaning "to take care of". A hospital-acquired infection (HAI), also known as a nosocomial infection, is an infection that is acquired in a hospital or other health care facility. Due to both hospital and nonhospital settings, it is sometimes called a health care–related infection (HAI or HCAI).Such an infection can be acquired in hospital, nursing home, rehabilitation facility, outpatient clinic, or other clinical settings. Nosocomial infections are usually caused by viral, bacterial and fungal pathogens. The most common types of nosocomial infections include the blood stream infections (BSI), Pneumonia (usually ventilator associated pneumonia VAP), urinary tract infections (UTIs) and surgical site infections (SSI), Gastroenteritis, Meningitis, Skin infections, Central nervous system infections. Nosocomial fungal infections (fungi cause about 9% of nosocomial infections) including Candida albicans, Aspergillus, Fusarium, Trichosporon, Malassezia. Nosocomial pneumonia including Bacterial pneumonia, Legionnaires' disease, Pulmonary aspergillosis, Mycobacterium tuberculosis, Viral pneumonias, Respiratory Syncytial Virus, Influenza. Nosocomial infections by pathogen including Staphylococci, Pseudomonas, Escherichia coli and. Antibiotic-resistant nosocomial infections including Methicillin resistant staphylococcus aureus (MRSA), Vancomycin-resistant staphylococcus aureus, Vancomycin-resistant enterococci (VRE).[1, 2, 3, 4, 5]

The highest rates of nosocomial infections are witnessed in intensive care units (ICUs), which are also the units in which the most severely ill patients are treated and in which the highest mortality rates are observed. The latter results from the acute severity of sickness of intensive care unit patients and their frequent exposure to therapeutic procedures. Thus, intensive care unit patients are both at risk for gaining nosocomial infections and at risk for dying. Establishing a relationship between severity of illness, therapeutic activity, manifestation of nosocomial infections, and outcome requires separate analyses of illness severity and therapeutic activity as causes of nosocomial infections, and of nosocomial infections as causes of surplus illness severity and extra

therapeutic activity.[6]

The patients who are at probable risk for acquiring the nosocomial infection include the admitted patients (prolonged intensive care unit stay), the medical staff, the patient care takers, usually immune compromised or immune deficient patients, children and aged people. The symptoms vary with respect to the acquired infection but some common symptoms include: discharge from a wound, fever, cough, shortness of breath, burning with urination or difficulty urinating, headache, nausea, vomiting, diarrhea etc.[7]

The standards for the risk factors of nosocomial infections in intensive care units are classified as: **increased liability**: patients admitted in hospitals have poor state of health, which means lower defense quality against bacteria. This group includes elderly, premature babies and immune deficient patients (because of drug abuse, illness or irradiation therapy). Patients with Chronic Obstructive Pulmonary Diseases have precisely increased chances of acquired respiratory tract infection.

Invasive devices: including intubation tubes, catheters, surgical drains, and tracheotomy tubes may donate to cause nosocomial infections. Patients already admitted undergoing these procedures are at high risk of nosocomial infection.

Medications or treatment: for example repeated blood transfusions make the patient vulnerable to infections like antacid treatment or antimicrobial therapy which eliminates competitive flora and allows flourishing of resistant organisms.[8, 9]

The treatment for nosocomial infection differ with the type of infection but generally includes: execution of aseptic technique, recurrent hand washing especially between patients, careful handling, cleaning and disinfection of inanimate objects, where possible use of disposable items, isolate patients, avoid where possible of medical dealings that can lead with to nosocomial infection, use of various established methods such as air filtration within the hospital and appropriate isolation precautions to protect patients, visitors etc. The overall prime outcomes include hospital mortality and costs. Secondary outcomes include prolonged length of stay in hospital, increased days of intravenous antibiotics, amplified multi organ dysfunction and intensive care unit length of stay.[10, 11]

MATERIAL AND METHOD

The data was collected through an evaluation form which was designed in such a way that it covered the following aspects such as; patient demographics (name, age, gender, address, district etc.), length of hospital stay, type of nosocomial infections during his/her stay, prevalence of these infections in public and private sector hospitals, risk factors associated with these infections, patient outcomes after acquiring infections and their management by health care providers (physicians, pharmacist, nurses) etc. The collected data was analyzed and results were presented in the form of frequency tables and graphs. Conclusions and recommendations were given at end based on the results obtained from the study.

RESULTS

The nosocomial infection in intensive care unit patients was more prevalent in public sector hospitals. It's about 70% in public sector and 32% in private sector hospitals. In the study, it was observed that majority of the population was affected by the gastrointestinal infection while blood stream, urinary tract infection and respiratory affected minority. Multiple types of nosocomial infection were diagnosed these days including gastrointestinal infection, urinary tract infection, Blood stream infection, respiratory infections and many more. The most common type of infection observed in this study was gastrointestinal infection that was 34% prevalent in public and 40% prevalent in private sector hospitals. The diagnosis of infection was made 48 hours after the admission in intensive care units in majority of the cases, 50% in public sector and 60% in private sector hospitals.

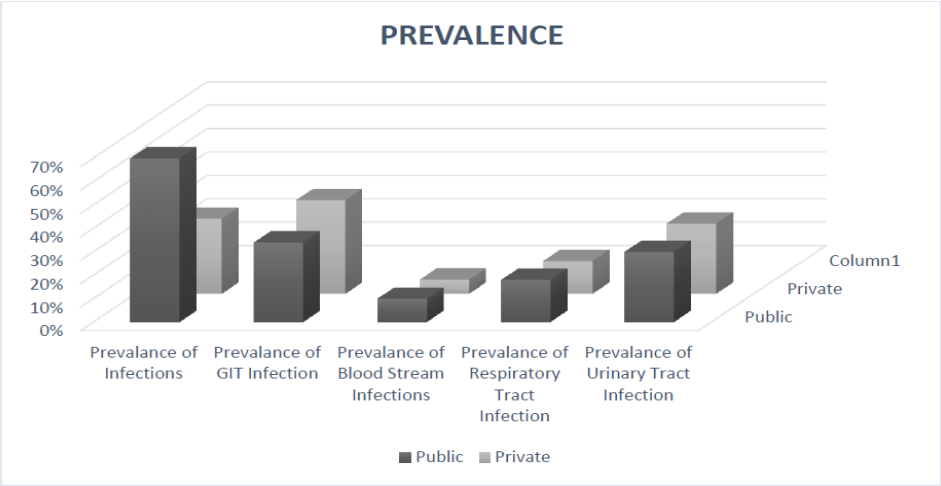

Figure 1: Related to Prevalence.

Nosocomial infection was found to be prevalent in both the public as well as private health sectors of Lahore. The most common type of infection diagnosed to the patients admitted in ICU was gastro intestinal infection. Urinary tract and respiratory tract infections were also prevalent while blood stream infections were also prevalent as a minorit

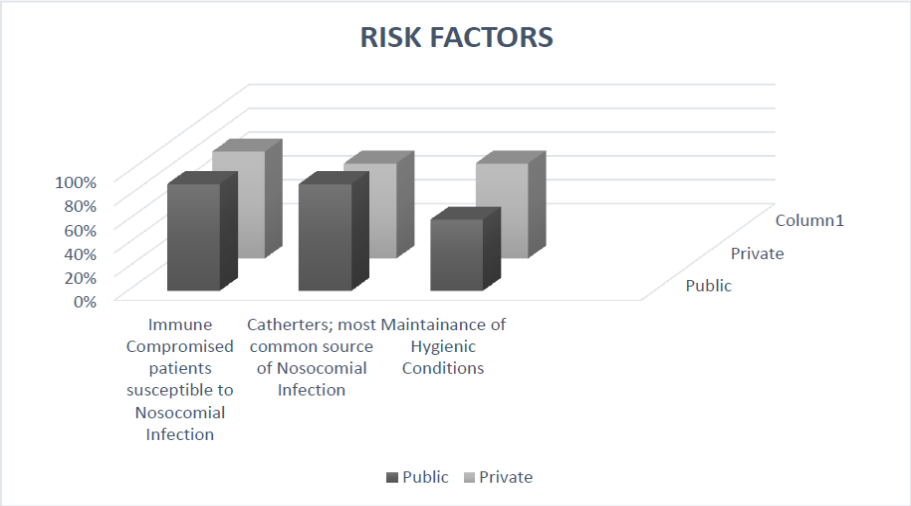

Figure 2: Related to Risk Factors.

The most common outcome of the nosocomial infection was increased length of hospital stay which as a result caused increase in the cost of treatment and increased use of medication. In public sector, it was 50% and in private sector hospitals it was 40% of the outcomes of nosocomial infection. For its treatment, 90% of the public as well as private sector hospitals gave medication therapy.

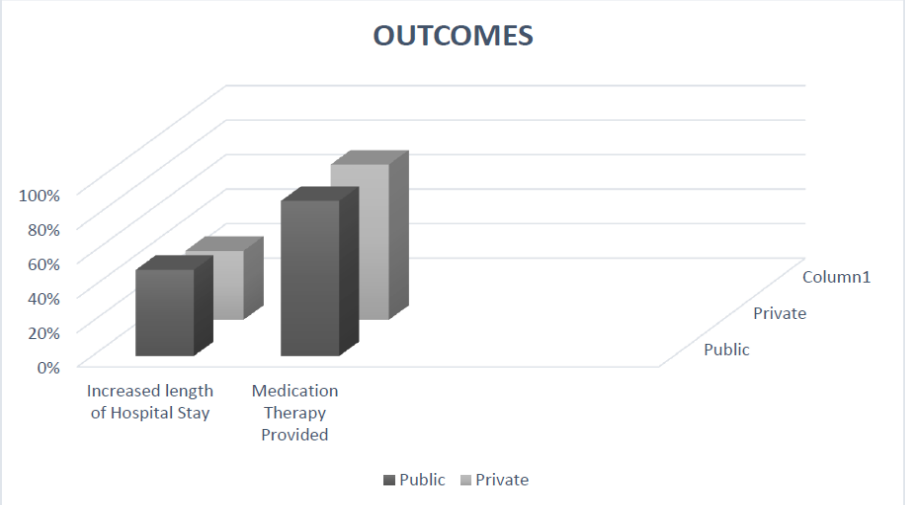

Figure 3: Related to Outcomes.

In this study, it was found that monitoring of the nosocomial infection was observed in half of the public sector hospitals but not in private sector hospitals. Management guidelines were present in half of the private sector hospitals while in both the public-sector hospitals but there was no surveillance program in both sectors. Counselling by the physician was done in private sector hospitals but was not observed in public sector hospitals.

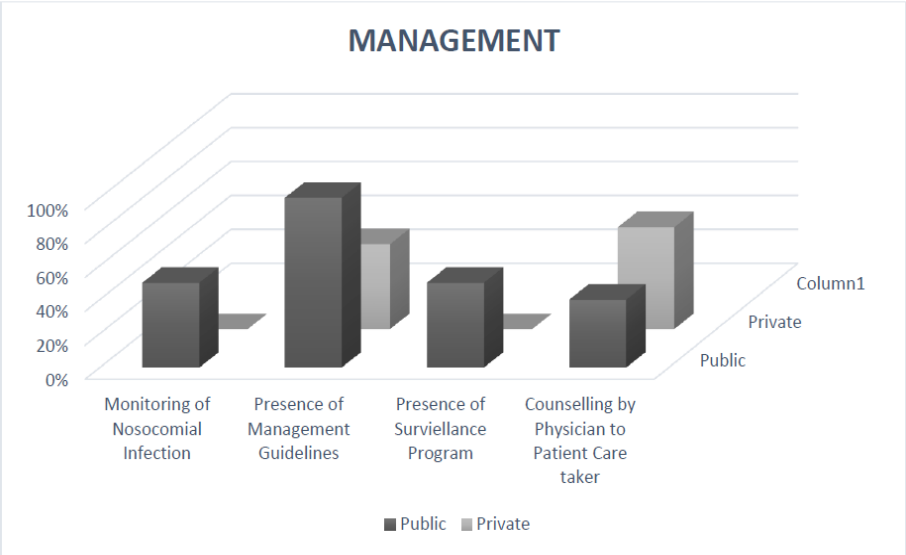

Figure 4: Related to Management.

DISCUSSION

Nosocomial infection is an infection that is acquired in a hospital or other health care facility. Due to both hospital and non-hospital settings, it is sometimes called a health care associated infection. Such an infection can be acquired in hospital, nursing home, rehabilitation facility, outpatient clinic, or other clinical settings. The patients who are at potential risk for acquiring the nosocomial infection include the admitted patients, the medical staff, the patient care takers, usually immunocompromised or immune deficient patients, children and aged people. The symptoms vary with respect to the acquired infection but some common symptoms include: discharge from a wound, fever, cough, shortness of breath, burning with urination or difficulty urinating, headache, nausea, vomiting, diarrhea etc.[12]

The presence of nosocomial infection in intensive care unit patients were more prevalent in public sector hospitals. In this study, it was observed that nosocomial infection was usually diagnosed after 48 hours after hospital admission in both public and private hospitals. Most common source of nosocomial infection in both public and private hospitals were catheters and tubing's. The most susceptible population to nosocomial infection was found to be immune compromised patients while a few include children or aged people both in public as well as private sector. Isolation and sterilization of the equipment were used majorly to prevent and manage the nosocomial infection in both sectors while isolation of the specific patients was also observed.[13]

Measures taken for the sterilization of intensive care units were not so well both in public and private hospitals. The guidelines were present and were followed by both of the public-sector hospitals while one out of two private sector hospitals did not have the guidelines. Monitoring of the nosocomial infection was not observed majorly in both sectors while a few had this monitoring practice. Medication therapy was done for the management of the nosocomial infection in both private and public-sector hospitals majorly.[13, 14]

As per study findings, Counselling of the patient care taker was done by majority of the private sector hospitals and majority of the public-sector hospitals did not provide any sort of counselling to the patient care taker. During study, it was found that monitoring of the nosocomial infection was not observed majorly in both sectors while a few had this monitoring practice.[15]

CONCLUSION

From the study it is concluded that nosocomial infection is prevalent in both the private and public sector hospitals. There is a need to evaluate the root cause of infection and then try to eradicate it through various methods, procedures and monitoring programs. The guidelines must be followed and amended according to the latest research so that it may contribute towards the betterment of patients. The patients as well as their care takers must be counselled well by the physician or the pharmacist about the nosocomial infection so that people consider their health issues more seriously. And there is a dire need of documentation of all the risks, outcomes and management of the nosocomial infection so that it may be treated well or prevented in the future.

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