

RISK EVALUATION OF NOSOCOMIAL INFECTION IN HINDU AND MUSLIM POPULATION: A REVIEW ARTICLE

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ABSTRACT

Nosocomial infection is hospital-acquired infection (HAIs). These infections occur in developed and developing countries. These infections occur generally due to prolonged stay in hospital but the main reason of these infections are breaches of infection control practices and procedures, unclean and non-sterile environmental surfaces, and/or ill employees. Nosocomial infection can be caused by various infectious agents like Virus, Bacteria, Fungi etc. Nosocomial infections depend mainly on two things, immune system of the patient and second amount of infectious agent surrounding the patient. Personal hygiene and lifestyle choices and habits also play key role in combating infections. Sometimes, socio-cultural practices can

indirectly affect these choices. In the current review, studies have been explored to look for nosocomial infections in Hindu and Muslim population to find a f religion-specific differences in their habits, personal hygiene and immune system and nosocomial infections in these specific communities.

KEYWORDS: Hospital-acquired infection, nosocomial infections, Hindu, Muslim communities, Personal hygiene.

INTRODUCTION

India is a big country with diverse population belonging to various castes and religion like Hindu, Muslim, and Christian. All these communities have certain specific habits that might

affect their immunity and in turn their proneness towards infections. Nosocomial infection or hospital-acquired infection (HAIs) is a serious and very common issue facing most of the hospitals and it will be interesting to see if community practices have any role to play in catching these infections or in other words, whether one community gets more nosocomial infection than the other owing to their personal hygiene and habits and practices.

Nosocomial infection

Nosocomial infection it is a hospital-acquired infection (HAIs) which patients catch in hospital settings during their prolonged stay. It can be acquired in nursing home or rehabilitation centre. Nosocomial infection is not present in the patient before admission to the hospital, but occurs after hospitalization. The chance of Nosocomial Infection will be more in patients at hospital site (Hassan Ahmad Khan *et al.*, 2017).

Centre for disease control and prevention (CDC) has set up stringent guidelines for the control of infections in hospital setting and it is followed universally. The universal modality of treatment of infections is via antibiotics, but emphasis should be given on prevention rather than cure and therefore, the infection control guidelines should be followed by all parties concerned and routine training should be imparted to the staff from time to time.

These infections occurs mainly due to two major reasons; one being the weak immune system of the patient and second due to poor hospital hygiene or areas surrounding the patient during the prolonged stay of the patient in the hospital.

Microorganisms which are responsible for infections are transferred by hospital staff and ventilating system and surgery during hospitalization in ICU ward. The common microbial species responsible for infections in hospital environment are *Pseudomonas aeruginosa*, *Klebsiella pneumonia*, *Escherichia coli*, *Candida spp.*

Generally bacterial infectious agents are *Staphylococci aureus* that causes wound, respiratory and gastro-intestinal infections, *Escherichia coli* that causes wound and urinary tract infections; Salmonella that causes food poisoning; Streptococci that causes wound, throat and urinary tract infections, Proteus that causes wound and urinary tract infection and *Mycobacterium tuberculosis* (*Mycobacteriaceae*) causes tuberculosis.

Some common examples of viral diseases responsible for Nosocomial Infections are HIV (Human Immunodeficiency Virus), Hapatitis B Virus, Rotavirus (Reoviridae), Influenza

Virus (*Orthomyxoviridae*), Herpes-simplex Virus, Enterovirus etc. Similarly some common fungal diseases are caused by *Aspergillus* spp., *Candida albicans*, *Cryptococcus neoformans*, *Fusarium* spp- etc.

Microbial agents can enter patient's body either exogenously, i.e, body contacts of patient (skin) via hospital site. These can be transfer through a contaminated device, health care worker, Surface etc.(e.g. *Staphylococcus aureus* and *E. Coli* are most common) or it can enter endogenously, inside the body of the patient (e.g. Enterobacteriasrase).

The possibilities of Nosocomial infection and factors responsible are environment, pollution, unhygienic conditions. One of them is hospital environment where humans are more prone to get infection. The possibilities to get Nosocomial infections are given below.

Possibility of nosocomial infections based on hospital hygiene

Hospital hygiene by patients, doctors, workers reduces the nosocomial infection. Good hospital hygiene minimizes the spread of pathogens. The cleanliness of hospital and sterilization techniques plays very important role to stop the infectious agents to spread. The sterilization procedures adopted by doctors and hospital staff also protects patient from infections and patient's own unhygienic conditions are also responsible for spread of infection.

Nosocomial infection possibility based on immune system of patient

A person's immune system plays important role in protection against Nosocomial infection. Patients are generally immune-compromised as a rule but still it can vary from patient to patient. If the immune system is weak then the chances of infection increases and if the patient has strong immune system, the chance of infection decreases. The immune system also depends on the patient's physical status.

The chance of getting infection reduces with personal hygiene. The immune system and proper hygiene protects your body from different air-borne infections. The person becomes less prone to nosocomial infection. The individual acquires good hygiene behaviour through knowledge, his upbringing and religion also plays a major role in personal hygiene and hand washing due to ritual practices can boost up one's immune system.

Immune system in Hindu population

There are some customs and religious rituals followed in Hindu community, which are helpful for their immune system and protects them from all kind of nosocomial infections. A ritual done in Hindu community named as *Surya Namaskar*, it stimulates the every system of the body and strengthens the heart, nervous system and makes the digestive system strong. The ritual makes the glands function properly and remove stress (Vaibhav *et al.*, 2016).

During the tenure of *Navaratri*, fasting reboot the immune system, clear old immune cells, regenerate new cells and protect against cell damage. Another ritual includes *Surya araghya* done in Hindu community in which sun rays reflect through the water impacting positive effect in the body which increase immunity.

Immune system in Muslim population

The regular prayer in Muslim community include Namaz and Roza, which gives physical health benefits, it balances the Anabolic and Catabolic bio-chemical process of the body. It is also considered good for brain, enhance flexibility of the body and reduces stiffness, also enhance blood flow, strengthening of leg muscles, important for lungs, thymus, immune system, and circulatory system. In the month of Ramdan, Muslim population keeps fast for a month, which has several health benefits as well (Osman Imamoglu, Ahmet Naci DILEK, 2016).

Roza of Ramadan regenerates the body's immune system. Fasting saves energy which recycles a lot of immune cells which are damaged and old. Prolonged fasting forces the body to store glucose, fat and ketones, and triggers stem cells to regenerate new white blood cells and reduce the enzyme PKA. This leads to proliferation of immune cells and rebuilding of immune system (Ibrahim Salti, Eric Benard Bruno Detournay, *et al.*, 2004).

Risk evaluation in nosocomial infection

Nosocomial infections sometimes become serious and dangerous for ICU patient because they have less immunity which may lead to high morbidity, mortality, length of stay and cost. The most susceptible infection site includes lower respiratory tract, urinary tract, blood - stream, wound and CNS (central nervous system) (Burcin Ozer *et al.*, 2011).

The most common source of infection in hospitals are central line associated blood stream infection (CLABSI), catheter associated urinary tract infection (CAUT), surgical site

infection (SSI), ventilator associated pneumonia (VAP) (Hassan Ahmad Khan Fatima Kanwal Baig, *et al.*, 2016).

Symptoms of nosocomial infection can range from fever, cough, nausea, vomiting, shortness of breath, discharge from wound, to mental confusion, hypo or hypertension and even septic shock (CDC, 2008).

Hospitals need to be very vigilant toward infection control and all precautions to prevent nosocomial infections should be taken by the hospital staff. The ICU should be screened regularly and sterilization should be done. Infected patients should be kept isolated or quarantined. Whenever required, the use of gloves, gowns, head mask and face protection should be done. Identifying the types of isolation is very much needed, which can help to protect others or reduce chances of further infections. Observing hand hygiene is the most important aspect of infection control, which involves washing hands before and after touching people, equipment, surfaces, literally anything in the hospital and cleaning surfaces with disinfectants with recommended frequency (Russel AD, Hugo WB, 1992).

Certain studies are being cited here to explore the role of community-specific differences in practices and habits that might have an indirect effect on their susceptibility or resistance towards catching infections with special reference to Indian Hindu and Muslim community.

In a study done by Anjali Adukia *et al.*, (2019), they explored the religion-specific differences in sanitation practices in India that contributes to transmission of infection, considering in particular the role of location-specific factors in driving observed differences between Hindus and Muslims and concluded that household sanitation practices vary substantially across areas of India, but that religion itself has less direct influence when considering differences between Hindus and Muslims within the same location.

GA Galanti (2008) in his book *Caring for Patients from Different Cultures* has covered a wide range of topics concerning the different cultural beliefs and practices that affect health care, including birth, end of life, communication, traditional medicine, mental health, pain, religion, and multicultural staff challenges. The book has been very useful for health care personnel in understanding the different unfamiliar expectations, anxieties, and needs based on their cultural beliefs. The book has presented hundreds of case studies that illustrate cross-cultural conflicts or misunderstandings as well as examples of culturally competent health

care. The book has illustrated cultural considerations for personal hygiene that affect their immunity and thus infection catching abilities. For example, orthodox Jews, Hindus and Muslims consider touching unrelated males taboo. Hindus and Muslims reserve the right hand only for eating, which is good hygiene practice. Japanese, Koreans, Chinese consider upper body cleaner than the lower body.

WHO has recognized the value of different religious and cultural issues that should be considered when dealing with the topic of hand hygiene and planning a strategy to promote it in health-care settings because these beliefs may strongly influence the implementation of guidelines related to hand hygiene and which in turn affects infection control in a hospital setting to a great extent. Hand hygiene is known to be practised not only for hygienic reasons, but for ritual reasons during religious ceremonies and symbolic reasons in specific everyday life situations. For example, Judaism, Islam, Hinduism and Sikhism have precise rules for hand-washing included in the holy texts and this practice punctuates several crucial moments of the day. The most common popular belief about hands, for instance in Hindu, Islam, and some African cultures, is to consider the left hand as “unclean” and reserved solely for “hygienic” reasons, while it is thought culturally imperative to use the right hand for offering, receiving, eating, for pointing at something or when gesticulating (WHO, 2009).

The study done by JP Narain (2016) elaborately explored the public health challenges faced by India. The country at present suffers from the triple burden of disease — the unfinished agenda of infectious diseases; the challenge of non-communicable diseases (NCDs), linked with lifestyle changes; and emergence of new pathogens causing epidemics and pandemics. In addition, the health infrastructure is already over-stretched and needs to be strengthened to enable it confront these challenges in the twenty-first century.

CONCLUSION

Nosocomial infection is hospital- acquired infection and it is a serious problem that threatens the credibility of a hospital and also adds to the health and economic burdens of patients, their families, as well as health care workers and the overall community. Therefore, it is of utmost importance that the issue is addressed by healthcare personnel, administrative staff and all personnel associated with the smooth running of a hospital. Awareness regarding cleanliness, disinfectants, sterilizations and personal hygiene among hospital staff from all strata is very essential to prevent it. Nursing staff especially needs to be very vigilant and aware about these things and follow hand hygiene between patients and all other guidelines

related to keep nosocomial infection to the minimum. The socio-cultural practices of diverse communities seems to play an indirect role in getting these infections as cited in the studies in the current review and more studies needs to be done to evaluate the risk evaluation of nosocomial infections based on religion-specific differences in various communities. All the good practices should be introduced into the daily routines of a hospital. In the wake of the COVID-19 pandemic, the issue of nosocomial infection is even graver and aggressive infection control is the need of the hour for each and every hospital.

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