Nosocomial Infection and Mortality Rate in Intensive Care Units

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Abstract

According to figures, the risk of death is 2.48 times higher in patients with hospital infections than in other patients. The current paper was aimed to discuss the past literature regarding the problem of nosocomial infections in intensive care unit (ICU). The electronic search was conducted in the databases: EBSCO, CINHAL and PubMed. According to literature, the rates of nosocomial infections in ICU was high. Mostly, the current infection control system in hospitals is likely to continue ineffective unless the principal barriers and challenges are sufficiently addressed.

Keywords: Nosocomial Infections; ICU; Mortality Rate

Introduction

Infection, also known as Hospital Acquired Infection (HAI), is an infection that affects a patient within 48 hours of admission to the hospital [1]. The first national survey on the topic of hospital infection was conducted in Australia through public and private hospitals in 1984 [2].

There are several factors that may increase the chance of a patient being exposed to a hospital infection; among these factors, decreased immunity of the patient, increasing variety of medical and invasive procedures creating possible means of infection, and the transmission of drug-resistant bacteria in crowded hospital populations; where poor infection control practices may assist transmission [3-10]. The three most common sites of the infection were related blood stream catheter (32%), Mechanical Ventilator (MV) with patient complain of respiratory diseases such as pneumonia (25%), and urine catheter-associated Urinary Tract Infection (UTI) (23%) [11].

Nosocomial infection not only affects the general health of patient [12-26], but they have also a huge financially burden. At any time, over 1.4 million people worldwide suffer from infection complication acquired in hospital [12-26]. Nosocomial infection increases the

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cost of health care in the countries least able to afford them through increased length of hospitalization treatment with expensive medication and use other services [27].

According to figures, the risk of death is 2.48 times higher in patients with hospital infections than in other patients. And, the common nosocomial infection was ventilator nosocomial infection in intensive care unit (ICU), it was related to poor hygiene hand washing [27].

The global acceleration in both community and hospital acquired antimicrobial resistant bacteria is threatening the ability to effectively treat patients. The treatment option is severely limited because these bacteria frequently display multi drug resistance [28].

**Aim of the Study**

The current paper was aimed to discuss the past literature regarding the of nosocomial infections in ICU.

**Methods**

**Search strategy**

The electronic search was conducted in the databases: EBSCO, CINHAL and PubMed. The searching keywords were: “nosocomial infections”, “intensive care unit”, and “Mortality Rate”.

Studies published in the English language in 2000 and more, discuss the topic of nosocomial infections and mortality rate in intensive care unit were included in the review.

**Search outcome**

Examining of the literature resulted in 200 titles for review. The final examination resulted in 68 studies, not including studies consisting merely of abstracts, and unrelated studies.

**Results and Discussion**

Risk factors for nosocomial infection included older age, immunosuppressant, longer hospital stays, multiple underlying chronic illnesses, frequent encounters with health care facilities, recent invasive procedures, MV support, indwelling devices and stay in a CCU with increased risk of hospital acquired infection [3]. In Turkey, a study followed patients treated for more than 24h in the neurology ICU of the training and research hospital until death or two days after discharge. The results indicated that the total rate of ICU-acquired nosocomial infection was 88.9 out of 100 patients. The mortality among patients with nosocomial infections was 69%, comparing with 60% the overall mortality rate. The risk factors for mortality were infection (nosocomial and community-acquired), nosocomial infection, mechanical ventilation, presence of two or more underlying diseases, parenteral nutrition, steroid treatment and a low Glasgow Coma Scale (GCS) score [29]. Similarly, a recent study European indicated that the rates of hospital-acquired infections in ICU were very high, and rates of antimicrobial resistance were > 50% for the most antimicrobial sets. Invasive devices and a viral CNS infection were associated with hospital-acquired infections acquisition. While Intubation and diabetes mellitus increased mortality in patients who acquired hospital-acquired infections [30].

It was noticed that nosocomial infection UTI developed during indwelling urine catheter contaminated with microorganisms; about 40% of nosocomial infections in the world are UTI [31]. Nosocomial infection is a significant problem in pediatric intensive care unit (PICU). The common nosocomial infections in PICU were blood stream infection (20 - 30%), lower tract infection (20 - 35%), UTI (15 - 20%). While the common pathogens involved Staphylococcus, E. coli Pseudomonas, Klebsiella and Candida [32]. With respect to the role

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played, invasive devices in contributing to nosocomial infection, present by a study showed that 62.5% of UTI and 60% of pneumonia associated with mechanical ventilation and 100% of blood stream infection [33]. Likewise, a study conducted in the Respiratory Intensive Care Unit (RICU) of a teaching hospital in Northwest China, confirmed that the lower respiratory tract (43.1%), urinary tract (26.5%) and bloodstream (20.6%) infections signify the majority of nosocomial infections. The *Staphylococcus aureus* (20.9%), *Klebsiella pneumoniae* (16.4%) and *Pseudomonas aeruginosa* (10.7%) were the most frequently isolated pathogens. Whereas the infection rates of device-associated were urinary catheter (9.8), central catheter (7.4) and ventilator [34].

In Iran, in a more recent retrospective study, the findings revealed that the hospital-acquired infections in ICU were ventilator-associated events, UTI, and pneumonia events and lower respiratory tract infection. While the most predominant hospital-acquired infections were bloodstream infections, pneumonia events and lower respiratory tract infection and eye, ear, nose, throat, or mouth (EENT) infections in the neonatal ICU [35].

The prevalence of nosocomial infections can be reduced by adopting policies including hand washing and reducing antibiotic resistance. Studies have been conducted in South America and Asia urban hospitals, confirmed that hand hygiene was the strongest effective intervention in reducing nosocomial infection rates [36].

The majority of health care-associated infections can be prevented by adequate, yet not necessarily sophisticated, surveillance and control procedures [37-49]. However, the challenges and barriers to the formulation and implementation of infection control policy were complex and related to, suboptimal knowledge and attitudes, poor funding and insufficient management [50-57].

The reducing of hospital infection will reduce the rate of spending on treating patients from complications of the spread of hospital infection and reduce the rate of deaths resulting from hospital infection [58-68].

**Conclusion**

According to literature, the rates of nosocomial infections in ICU were high. Mostly, the current infection control system in hospitals is likely to continue ineffective unless the principal barriers and challenges are sufficiently addressed. Multidimensional interventions particular to local settings are needed to be planned and implemented in hospitals. Hand washing and strategies to control antibiotic resistance in hospital have an important role in controlling of nosocomial infection.

**Recommendation**

- There is a need for urgent revision of infection control policies and their implementation.
- There is a need for Interventions that are specific to local conditions need to be planned and implemented in hospitals.
- There is a need for strategies to control antibiotic resistance hospital.
- There is a need for education program for health teams about correct rout of hand washing.

**Bibliography**


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