

NOSOCOMIAL INFECTIONS ASSOCIATED WITH DEVICE USAGE IN A TERTIARY CARE HOSPITAL IN NORTHERN INDIA

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ABSTRACT:

Nosocomial infections are a frequent occurrence in ICUs because of the severity of underlying diseases, the frequency of invasive interventions, and the frequent use of wide-spectrum antibiotics. This prospective study was undertaken with the aim to determine nosocomial infections and to study predisposing risk factors in patients being submitted to an ICU in a tertiary care hospital. Swab samples were collected from patients with endotracheal intubation and central venous catheters. The risk factors for bacterial colonization in the ICU were hospitalization for more than 48hrs, use of multiple antibiotics, preexisting co-morbidities and use of mechanical ventilation. The results of the study delineate the fact that knowledge of resident microbial flora and their sensitivity profile is of utmost importance while making guidelines for treatment strategies in ICU patients.

Key words: ICU, Central Venous Catheters, Endotracheal intubation, Nosocomial infections, Risk factors

Introduction

Infections in ICU are frequent and pose a serious problem. National Nosocomial Infections Surveillance system defines a nosocomial infection as a localized or systemic condition that results from adverse reaction to the presence of an infectious agent(s) or its toxin(s) that was not present or incubating at the time of admission to the hospital¹. Although the Intensive Care Units (ICUs) account for fewer than 10% of total beds in most hospitals, more than 20% of all nosocomial infections are acquired in ICUs². Nosocomial infections are typically exogenous, the source being any part of the hospital ecosystem, including people, objects, food, water, and air in the hospital³. They overburden the hospital budgets by increasing stay in the hospitals and increase in morbidity and mortality. Moreover many risk factors like diabetes mellitus, intubation, surgical exploration, use of drains and lack of aseptic precautions predispose the patient to nosocomial infections. This study

was undertaken with the aim to determine nosocomial infections and to study predisposing risk factors in patients being submitted to an ICU in a tertiary care hospital.

Materials and methods

This was a prospective study and was conducted in the ICU of a tertiary care hospital. Ethical clearance was obtained from the institutional ethics committee before initiation of study. A total of 95 patients out of which 70 were males and 25 females were included in the study. All patients with endotracheal tubes and central venous catheters were included. The tip of the endotracheal tube was cut with a sterile blade and sent in a sterile tube for bacterial culture. About 5cms of catheter was cut and sent to laboratory for culture. The cultures were done on sheep blood agar and MacConkey's agar. They were incubated overnight and then examined for growth. Organisms were identified on the basis of colony characteristics and biochemical reactions.

Results

This study was conducted on 95 patients of ICU.
Sixteen out of 95 patients admitted to ICU

suffered from nosocomial infections (16.84%).
The demographic characteristics of all patients are summarized in table 1.

Table 1: Demographic characteristics of patients admitted to ICU

Characteristic	Number of Patients (%)
Co-morbid conditions	
Respiratory diseases	53(55.78)
Diabetes mellitus	32(33.68)
Heart diseases	61(64.21)
Malignancy	6(6.32)
Chronic renal disease	29(30.53)
Chronic liver disease	24(25.26)
Steroid usage	46(48.42)
Mode of ICU admission	
Medical	60(63.16)
Surgical	35(36.84)

In this study, it was observed that 4 patients had UTI, (3) pneumonia, (4) soft tissue infections, (2) blood stream infections, (1) had meningitis, (2) had gastroenteritis.

Table 2: Distribution of nosocomial infections among ICU patients

Nosocomial Infections	Number of Patients (%)
Urinary tract infections	4(25)
Pneumonia	3(18.75)
Soft tissue infections	4(25)
Gastroenteritis	2(12.5)
Blood stream infections	2(12.5)
Meningitis	1(6.25)

Table 3: Nosocomial Infections due to Device use

Nosocomial Infection	Device	Infection With Device	Infection Without Device
UTI	Catheter	3(60)	2(18.18)
Pneumonia	Ventilator	1(20)	3(27.27)
Blood stream infections	CVC	1(20)	-
Others		-	6(54.55)
Total(16)		5	11

Discussion

The incidence of nosocomial infection in our study was 16.84% which is in accordance with many other similar studies⁴. The pattern of infections is similar to many other studies⁴⁻⁶.

Nosocomial infections are fast becoming a difficult problem in hospitalized patients especially in the ICU. This is more common in patients requiring insertion of devices leading to serious concern. These infections account for substantial morbidity, mortality and increase the cost of health care by manifold.

Conclusion

This study has highlighted the fact there is significant increase in incidence of nosocomial infections in ICU patients undergoing endotracheal intubation and CVC insertion. Prompt identification of these infections and curtailing use of devices in ICU patients with appropriate pharmacotherapy can significantly address the problem.

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