https://dx.doi.org/10.21088/ijsn.2277.467X.4215.1
IJSN
Volume 4, Number 2

Incidence of Hospital-Acquired Infection among ICU Patients and its Association with Selected Factors in IMS & SUM Hospital, Bhubaneswar

Farzana Begum

Abstract

The purpose of the study is to assess the incidence of Hospital-Acquired Infection among ICU patients and its association with selected factors in IMS & SUM Hospital, Bhubaneswar, Odisha. Nosocomial infections can be defined as those occurring within 48 hours of hospital admission, 3 days of discharge or 30 days of an operation. They affect 1 in 10 patients admitted to hospital. The approach/design of the study was Non-Experimental Descriptive research design /Survey approach, which were carried out among 100 patients admitted in ICU of IMS & SUM Hospital, Bhubaneswar, Odisha, selected by Non-Probability convenience sampling technique. An exclusive review of literature helped in preparation of data collection tools to assess the observed factors responsible for developing HAI. A structured Questionnaire was administered to collect demographic data and data on observed responsible factors for developing HAI. The techniques used for data collection were interview and participative observation. The analysis of the obtained data was based on the objective of the study. Descriptive and inferential statistics were used for data analysis and data interpretation**.** Results of the study revealed that ICU the incidence of Hospital-Acquired infection was 12% among them 3% of sample getting infection through I.V line, 7% of sample getting infection through catheter, 2% of sample getting infection through respiratory procedure and rest 88% of sample are not infected. It was concluded that the Incidence of Hospital-Acquired Infection among patient admitted in ICU, SUM Hospital is 12% & is due to some wrong practices of the health care provider. The most effective technique for controlling nosocomial infection is to strategically implement quality control measures to the health care sectors, and evidence-based management can be a feasible approach. For those with ventilator-associated or hospital-acquired pneumonia, controlling and monitoring hospital indoor air quality needs to be on agenda in management, whereas for nosocomial rotavirus infection, a hand hygiene protocol has to be enforced.

Keywords: Assess; Association; Factors; HAI; ICU; Incidence; Nosocomial; Patients.

Introduction

A hospital is an institution where the sick or injured are given medical or surgical care. Developing hospital acquired infection is nothing but simply certifying the quality of care provided by the hospital. A hospital-acquired infection or HAI, is an infection whose development is favored by a hospital environment, such as one acquired by a patient during a hospital stay. Most infections that become clinically evident after 48 hours of hospitalization are considered hospital-acquired. Such infections include fungal and bacterial infections and are aggravated by the reduced resistance of individual patients.

In the United States, the Centers for Disease Control and Prevention estimated roughly 1.7 million hospital-associated infections, from all types of microorganisms, including bacteria, combined, cause or contribute to 99,000 deaths each year. In Europe, where hospital surveys have been conducted, the categories of Gram-negative infections are estimated to account for two-thirds of the 25,000 deaths each year.

The study is conducted to determine the incidence of hospital acquired infection among ICU patient in SUM hospital, Bhubaneswar and its association with following selected factors, e.g., urinary catheter, respiratory procedures & I.V. lines.

Author Affiliation: Medical Surgical Nursing, SUM Nursing College/ SOA University, Khandagiri Square- 751030, Bhubaneswar, Orissa, India.

Correspondance: Farzana Begum, Medical Surgical Nursing, SUM Nursing College, SOA University, Khandagiri Square- 751030, Bhubaneswar, Orissa, India.

Email: farzana_begum12@rediffmail.com

Problem Statement: Incidence of Hospital-Acquired Infection among ICU patients and its association with selected factors in IMS & SUM Hospital, Bhubaneswar, Odisha.

Aim of the study: This study aimed to evaluate incidence of HAI, identify the factors responsible for developing HAI and find out the association between the incidence and observed factors associated with HAI.

Objectives of the study

1. Find out the incidence of Hospital-Acquired Infection among ICU patient of IMS & SUM Hospital.
2. Identify the factors responsible for Hospital-Acquired Infection among ICU of IMS & SUM Hospital.
3. Find out the association between incidences of Hospital-Acquired-Infection with selected factors.

Materials and Methods

Research Methodology

Research Approach

Quantitative Research Approach

Research Design

Non-Experimental Descriptive Research Design

Setting

ICU of IMS & SUM Hospital, Bhubaneswar, Odisha.

Sample Population

Sample Size: 100

Sampling Techniques: Non-Probability convenience sampling

Inclusion criteria are:

(a) The patients those are admitted in ICU of IMS & SUM Hospital, Bhubaneswar, detected with HAI. (b) Those who are willing to participate in this study. (c) Those who are available during the study.

Exclusion criteria are

(a) The patients those are not admitted in ICU of IMS & SUM Hospital, Bhubaneswar, and not detected with HAI. (b) Those who are not willing to participate in this study. (c) Those who are absent during data collection.

Research tool for data collection

Self structured questionnaire was developed to assess the incidence of HAI among ICU patients by reviewing related literatures, books, journals, published and unpublished research studies, consultancy and guidance from various subjects, experts and in related fields, past experience of the investigator, formal and non-formal discussion with peer groups and consultation with statistician for data analysis. After revealing the research and non-research material, opinion from experts, a self structured questionnaire was constructed for collecting socio-demographic data and to assess the incidence of HAI among ICU patients. The tool used in the present study includes the following section**.** Section-A includes socio-demographic data and Section-B includes observed factors responsible for HAI.

Pilot study

Pilot study was carried out on 10% of total sample and it was excluded from the study subject to test the feasibility, applicability and the clarity of the questionnaire and to estimate the length of time needed to fill the sheet. As a result of the pilot study, the necessary modification in the tools was done and the final form was developed.

Implementation phase

Data collection period for this study was from October 2012 to November 2013, the researcher collected the data during the morning from 9A.M. to 1P.M, six days / week, at ICU of IMS & SUM Hospital, Bhubaneswar, Odisha. The researcher filled the questionnaires by interview and observation method.

Ethical consideration

At the initial interview, all subjects were informed about the nature, purpose and benefits of the study and that their participations were voluntary. They were individually interviewed for the socio-demographic data. Also, all the information was kept confidential.

Limitation of the study

The scope of the study was limited and the study finding could not be generalized because of the non-probability convenience sampling technique, sample size limited to 100 and time constrains.

Validity

Validity is the suitability of the instrument or tool, for which it is prepared to measure. The tool was validated by three nursing experts, one critical care specialist and one statistician and recommended corrections were made in the tool.

Reliability

Reliability is the degree of consistency or dependability of the tool. It was tested on 10 ICU patients with HAI of IMS & SUM Hospital, Bhubaneswar, Odisha, by using Chronbach reliability formula. The reliability value was 7.2, thus it indicates that the questionnaire was reliable.

Data Analysis

Statistical analysis involves segmentation of a complex problem to smaller section & the smaller segments are analyzed, then the result co-related with respect to the whole process in order to solve the problem. The data analysis was carried out by using both descriptive, inferential statistics and on the basis of objectives of the study & the hypothesis set by the investigator.

Table 1: Distribution of the sample according to infected body fluid

Infected Body Fluid	Frequency(f)	%
Blood	3	3%
Urine	7	7%
Tracheal secretion	2	2%
None	88	88%

Table 1 shows that Distribution of the sample according to infected body fluid depicts 3% of sample getting infection through I.V line, 7% of sample getting infection through catheter, 2% of sample getting infection through respiratory procedure & rests 88% of sample are not infected.

Fig .1: Distribution of the according to infected body fluid

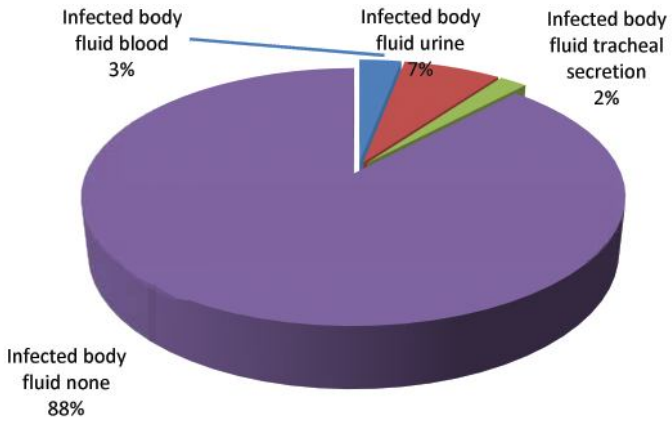

Fig.1 shows that Distribution of the sample according to infected body fluid depicts 3% of ample getting infection through I.V line, 7% of sample getting infection through catheter, 2% of sample getting infection through respiratory procedure & rests 88% of sample are not infected.

Table 2. Distribution of the sample according to Hand Hygiene

Hand Hygiene	Frequency(f)	%
Yes	16	16%
No	84	84%

Table 2 shows that Distribution of the sample according to Hand Hygiene depicts that in 16% of sample Hand Hygiene done and in 84% hand hygiene not practiced.

Fig. 2: Distribution of the sample according to Hand Hygiene

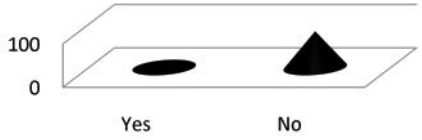

Table 3: Distribution of the sample according to Tracheostomy care

Tracheostomy Care	Frequency(f)	%
8hrly tracheostomy care given	94	94%
8hrly tracheostomy care not given	6	6%

Fig. 3: Distribution of the sample according to Tracheostomy care

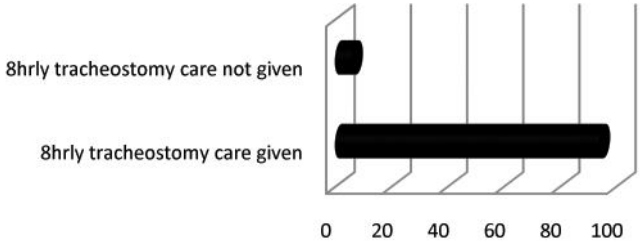

Table 4: Distribution of the sample according to change I.V. cannula in 72 hours

Change I.V.Cannula In 72 Hours	Frequency(f)	%
Yes	15	15%
No	85	85%

Fig.4: Distribution of the sample according to change I.V. cannula in 72 hours

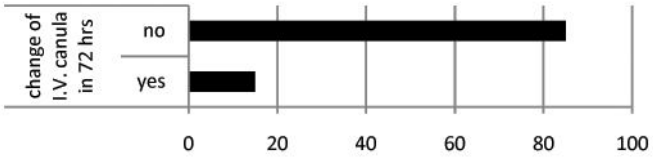

Table 5: Distribution of the sample according to use of pre-prepared heparin solution

Use of Pre-Prepared Heparin Solution	Frequency(f)	%
Yes	100	100%
No	0	0

Fig. 5: Distribution of the sample according to use of pre-prepared heparin solution

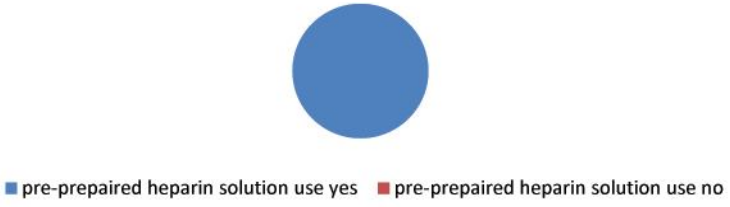

Fig. 2 shows that Distribution of the sample according to Hand Hygiene depicts that in 16% of sample Hand Hygiene done and in 84% hand hygiene not practiced.

Table 3 shows that Distribution of the sample according to using Tracheostomy care depicts in 94% of sample tracheostomy care given 8 hourly whereas 6% of sample tracheostomy care 8 hourly not given.

Fig.3 shows that Distribution of the sample according to using Tracheostomy care depicts in 94% of sample tracheostomy care given 8 hourly whereas 6% of sample tracheostomy care 8 hourly not given.

Table 4 shows that Distribution of the sample according to change I.V. cannula in 72 hours depicts for 15% sample I.V. cannula changed in 72 hours whereas in 85 % sample I.V. cannula not changed in 72 hours.

Fig.4 shows that Distribution of the sample according to change I.V. cannula in 72 hours depicts for 15%

Table 6: Distribution of the sample according to I.V. set nozzle closed while not in use

I.V. Set Nozzle Closed While Not in Use	Frequency(f)	%
Yes	94	94%
No	6	6%

Fig. 6: Distribution of the sample according to I.V. set nozzle closed while not in use

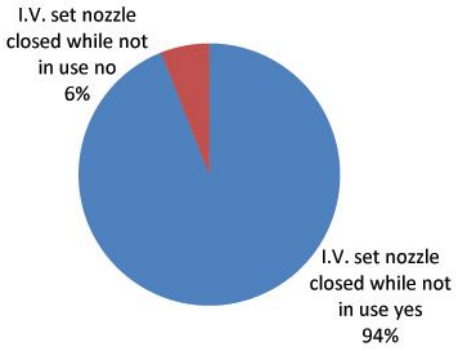

Table 7: Distribution of the sample according to daily practice catheter care

Daily Practice Catheter Care	Frequency(f)	%
Yes	0	0
No	100	100%

Fig. 7: Distribution of the sample according to daily practice catheter care

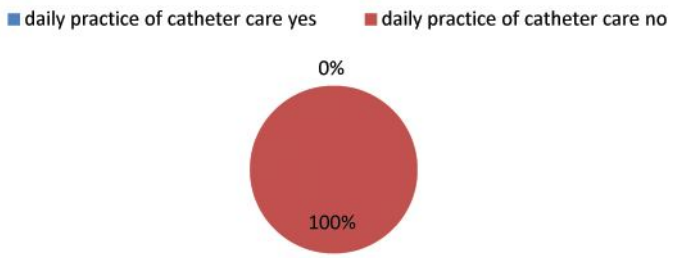

Table 8: Distribution of the sample according to change of catheter in every 15 days

Change of Catheter in Every 15 Days	Frequency(f)	%
Yes	7	7%
No	93	93%

Fig. 8: Distribution of the sample according to change of catheter in every 15 days

sample I.V. cannula changed in 72 hours whereas in 85 % sample I.V cannula not changed in 72 hours

Table 5 shows that Distribution of the sample according to use of pre-prepared heparin solution depicts in 100% sample pre-prepared heparin solution used to flush out before given any I.V. injection.

Fig.5 shows that Distribution of the sample according to use of pre-prepared heparin solution depicts in 100% sample pre-prepared heparin solution used to flush out before given any I.V. injection.

Table 6 shows that Distribution of the sample according to I.V. set nozzle closed while not in use depicts in 94% of sample I.V set nozzle closed while not in used & in 6% of sample I.V. set nozzle not closed while not in used.

Fig. 6 shows that Distribution of the sample according to I.V. set nozzle closed while not in use depicts in 94% of sample I.V set nozzle closed while not in used & in 6% of sample I.V. set nozzle not closed while not in used.

Table 7 shows that Distribution of the sample according to daily practice catheter care depicts in 100% of sample catheter care not given.

Fig. 7 shows that Distribution of the sample according to daily practice catheter care depicts in 100% of sample catheter care not given.

Table 8 shows that Distribution of the sample according to change of catheter in every 15 days depicts. In 7% of sample catheter changed in every 15 days & 93% of sample catheter not changed in every 15 days.

Fig. 8 shows that Distribution of the sample according to change of catheter in every 15 days depicts In 7% of sample catheter changed in every 15 days & 93% of sample catheter not changed in every 15 days.

As 3% of sample getting infection through I.V line, 7% of sample getting infection through catheter, 2% of sample getting infection through respiratory procedure and rest 88% of sample are not infected.

By conventional criteria, this difference among associated factors responsible for hospital acquired infection is consider to be not statistically significant, that means that all the factors are equally responsible for Hospital-Acquired Infection if not providing quality care.

Discussion

The present study shows that in ICU the incidence of Hospital-Acquired infection was 12% among them 3% of sample getting infection through I.V line, 7% of sample getting infection through catheter, 2% of sample getting infection through respiratory procedure and rest 88% of sample are not infected. By conventional criteria, this difference among associated factors responsible for hospital acquired infection is consider to be not statistically significant, that means that all factors are equally responsible for Hospital-Acquired Infection if not providing quality care.

Recommendation

Keeping in view of the finding of the present study, the following recommendations are made since the study was come out of small convenience sample. The result can only guide for further study.

A similar study can replicate a large sample drawn from ICU of different Hospital.

A co-relational study can be made to assess the incidence of Hospital-Acquired infection among ICU patients in different Hospitals.

Conclusion

It was concluded that the Incidence of Hospital-Acquired Infection among patient admitted in ICU, SUM Hospital is 12% & is due to some wrong practices of the health care provider

The most effective technique for controlling nosocomial infection is to strategically implement quality control measures to the health care sectors, and evidence-based management can be a feasible approach. For those with ventilator-associated or hospital-acquired pneumonia, controlling and monitoring hospital indoor air quality needs to be on agenda in management, whereas for nosocomial rotavirus infection, a hand hygiene protocol has to be enforced.

Acknowledgement

The author is grateful to Almighty God for accomplishment of this research work. The authors are also wish to thank all the patients and staffs of IMS and Sum Hospital for their participation in this study.

References

1. World Alliance for patient safety. WHO Guidelines on Hand Hygiene in Health Care. http://www.who.int/rpc/guidelines/9789241597906/en/. 2009.
2. Hugonnet S, Perneger TV, Pittet D. Alcohol based hand rubs improves compliance with hand hygiene in intensive care units. Arch Intern med 2002; 162: 1037-1043.
3. Haley RW, Culver DH, White J, Morgan WM, Amber TG, Mann VP, The efficacy of infection surveillance and control programs in preventing nosocomial infections in US hospitals. Am J Epidemiol. 1985; 121: 182-205.PubMed.
4. Haley RW, Culver DH, White JW, Morgan WM, Emori TG. The nationwide nosocomial infection rate: a new need for vital statistics. Am J Epidemiol. 1985; 121: 159-67.PubMed.
5. New York Times 1998 Mar 12; Sect. A12.
6. Centers for Disease Control and Prevention, Hospital Infections Program. National Nosocomial Infections Surveillance (NNIS) report, data summary from October 1986-April 1996, issued May 1996: A report from the NNIS System. Am J Infect Control. 1996; 24: 380–8. DOIPubMed.
7. Slaughter S, Hayden MK, Nathan C, Hu TC, Rice T, Van Voorhis J, A comparison of the effect of universal use of gloves and gowns with that of glove use alone on acquisition of vancomycin-resistant enterococci in a medical intensive care unit. Ann Intern Med. 1996; 125: 448–56.PubMed.
8. Bonten MJM, Hayden MK, Nathan C, Van Voorhis J, Matushek M, Slaughter S, Epidemiology of colonisation of patients and environment with vancomycin-resistant enterococci. Lancet. 1996; 348: 1615–9. DOIPubMed.
9. Hiramatsu K, Aritaka N, Hanaki H, Kawasaki S, Hosoda Y, Hori S, Dissemination in Japanese hospitals of strains of *Staphylococcus aureus* heterogeneously resistant to vancomycin. Lancet. 1997; 350: 1670–3. DOIPubMed.
10. Webster RG. Influenza: an emerging disease. Emerg Infect Dis. 1998; 4. DOIPubMed.
11. Fridkin SK, Welbel SF, Weinstein RA. Magnitude and prevention of nosocomial infections in the intensive care unit. Infect Dis Clin North Am. 1997; 11: 479–96. DOIPubMed
12. Weinstein RA. Epidemiology and control of nosocomial infections in adult intensive care units. Am J Med. 1991; 91: 179–84. DOIPubMed.