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Risks of infection among health care workers and its preventive measures observed by medical students in a tertiary care centre - A cross sectional study

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Abstract

Purpose: Health care-associated infections (HCAIs) are considered as public health problems. This study was conducted to assess the awareness of medical students on the risk of infection to health care workers and their practice towards basic infection control, such as standard precautions, hand hygiene, use of personal protective equipment, and the learning approaches that help improve their knowledge and practices.

Methodology: A cross-sectional study for a period of 3 months (April-June 2020) among 169 phase III part I MBBS students were conducted.

Results: Out of 169 students, 57.7% were females and 42.3% were males.

In PART A : there was average 94% knowledge of risk of infections and its preventive measures and in PART B mean of 82.5% had knowledge and practice of blood borne infections and prevention.

Conclusion: This study showed high prevalence of good knowledge and poor practice of universal precautions among medical students in the Faculty of Medicine and raises the need to address these issues during the clinical years.

Keywords: Healthcare Workers, Infection, Preventive, Medical Students, Hygiene.

Introduction

Health care-associated infections (HCAIs) are considered as public health problems. They are occupational health hazard as they pose significant risk of transmission of blood borne pathogens like human immunodeficiency virus/ Acquired immunodeficiency syndrome (HIV/AIDS), Hepatitis B virus and Hepatitis C virus among Health care professionals including medical students. Medical students are less knowledgeable when compared to other health care workers about health care associated infections (HAIs). HCAIs are associated with increased length of hospital stay and the emergence of multidrug-resistant bacteria.[1,2]. They exert increased morbidity and mortality[3], and increase the health care cost, both in developed and developing countries.[4] Thus the transmission of infection is of concern in all health care setups. Infection control is the discipline which helps prevent nosocomial or healthcare-associated

infection. It is an essential, though often under recognized and under supported, part of the infrastructure of health care[5]. Risk of exposure to blood-borne pathogens to health care workers can be effectively reduced through adherence to standard precautions by applying the basic principles of infection control through hand washing, utilization of appropriate personal protective equipment (PPE) such as gloves, masks, gowns, and eyewear, appropriate use of safety devices and efficacious needle disposal system at the work place[6]. Undergraduate medical education is the formative phase and appropriate moment for acquiring knowledge and skills. There is lack of evidence regarding explicit infection control training in the curriculum of most medical undergraduate courses, which needs to be addressed if HCAI rates are to be reduced[7].

This study was conducted to assess the awareness of medical students on the risk of infection to health care workers and their practice towards basic infection control, such as standard precautions, hand hygiene, use of personal protective equipment, and the learning approaches that help improve their knowledge and practices.

Methodology

Study Design: A Cross-sectional study.

Study Period: April 2020 to June 2020

Sample Size: A sample size of 169, calculated considering an absolute precision of 5% and a confidence level of 95%, assuming the awareness levels for risks of infection and prevention practices to be 50% among medical students.

Study Population: Medical Students of Phase III part 1 and 2 at Sri Devaraj Urs Medical College, Tamaka, Kolar were included in our study considering their exposure to bedside clinics in MBBS Phaser III.

Objectives

1. To assess the degree of knowledge regarding infection risk in health care professionals among medical students of Sri Devaraj Urs Medical College, Tamaka, Kolar.
2. To evaluate the knowledge and practice of the infection control measures.

Procedure

Ethical clearance was obtained from the Institutional Ethics Committee. After taking informed consent from the students, they were selected by simple random sampling. Each students demographic details such as age, gender and the year of MBBS course were noted. A semi structured questionnaire was given to collect information regarding their knowledge on risk of infection to health care workers and its preventive measures in PART A and information regrading their practice & various domains of infection prevention practices such as hand hygiene, needle stick injury prevention and standard precautions in PART B. WHO's concept of "My five moments for hand hygiene" has been utilized to evaluate hand hygiene practices.[7]

Part A and B of questionnaire has 14 questions each and to be answered as yes, no or don't know. They are scored as +1,0 and -1 (Yes/ correct answer: +1, Don't know: 0 and No/ incorrect answer :-1). The questionnaire was pretested before the data collection, and necessary modifications were made in terms of content and language.

Statistical Analysis

The data obtained from the completely filled questionnaires was entered and analyzed using SPSS ver. 22. The analysis was performed in terms of descriptive statistics , while categorical variables like gender, professional years, etc.in terms of frequency and percentage.

Results

In this study a total of 169 students were included. Out of 169 students, 57.7% were females and 42.3% were males.

Part A : Knowledge of risk of infections and its preventive measures.

Sn.	Questions	Correct Answer n=169 in %
1.	Microbial agents including bacteria, viruses, fungi and parasites are source of occupational infections	94.4
2.	Presence of standard precautions for infection control	96.5
3.	Hand washing minimizes risk of infectious disease	98.6
4.	We should wear gloves while handling medical waste, biological samples and doing procedures on patients	98.6
5.	Never to recap after using needle	50.7
6.	To wear shoes while attending clinical	91.5
7.	To wash your aprons regularly	98.6
8.	To where face mask while examining respiratory case	98.6
9.	To advice Patients with respiratory illness to wear face mask	98.5
10.	Bio-waste management includes generation, accumulation, handling, storage, treatment , transport and disposal.	97.2
11.	Should wash hands with soap and water when visibly dirty or contaminated with blood or other body fluids, after using restroom and before and after having food.	99.3
12.	Alcohol based hand rub should be used : - Before touching the patient - Before performing any procedures - After contact with patient - After contact with body fluids or exrections if hands are not visibly soiled. After touching patient surroundings.	97.2
13.	Personal protective equipment (PPE) includes gloves, protective eye wear (goggles), mask, apron, gown, boots/shoe cover, hair cover.	97.2
14.	There is colour coding for biomedical waste management.	98.6

Part B : Knowledge and practice of blood borne infections and prevention.

Sn.	Questions	Correct Answer n=169 in %
1.	Do you know Hepatitis B can be transmitted :	98.3

	- Blood borne - Sexual - Vertical - All	
2.	Hepatitis B infection prevented by vaccination (Yes)	100
3.	Hepatitis C infection prevented by vaccination (No)	42
4.	3 doses of hepatitis B vaccine along with Booster	87.4
5.	Are you completely Vaccinated for hepatitis B	73.9
6.	First to contact after accidental exposure to HIV is -ART cente -Casualty medical officer	 73.9 71.4
7.	Within 24 hours after accidental exposure to HIV ,post exposure prophylaxis should be initiated.	97.5
8.	Do you wear gloves when u have skin cut?	79
9.	Do you wear gloves when attending HIV reactive patient?	98.3
10.	Do you wear gloves every time you examine the patient?	77.3
11.	Do you use hand rub before and after touching the patient?	99.2
12.	Do you recap the needle?	35.3
13.	Do you use separate footwear in operation theatre, critical/ intensive care units?	99.2
14.	Do you dispose gloves, IV tubings, catheters in Red coloured bin?	95

Discussion

In this cross-sectional study, it is found that there is good overall knowledge of risk of infections and its preventive measures except for not to recap the needles (50.7% students only knew that needles should not be recapped after usage). In parameters such as the mode of spread of Hepatitis C Infection and its prevention, the total number of doses of Hepatitis B vaccination to be administered, whom to contact first after accidental exposure to Human Immunodeficiency Virus, whether they wear gloves when they have cut/ abrasion over skin and whether they wear gloves every time they examine a patient and if they will recap the needles after use showed poor practice towards infection control with 42%, 84.7%, 73.9%, 79%, 77.3% and 35.3 % respectively only showed good practice. Out of 169 students only 73.9% students were completely vaccinated for Hepatitis B, when they are the most high risk professionals dealing with patients and blood borne pathogens during patient examination and patient care. Only 35.5% of the participants in our study knew that needles should not be recapped after use which is lesser than 58% reported in the Iranian study.

Furthermore, compared to 94.4 % of the students in our study, 100% of the students in an Iranian study thought that blood and all bodily fluids of patients are infectious .[8] While there was no relationship between the level of knowledge and actual practice of universal precautions in our study; a significant positive association was recorded

between knowledge and practice among the students in the Iranian study[8]. Many researches have shown that people with a good practice are not necessarily knowledgeable and vice versa.[9] Studies done among healthcare workers in Pakistan and Texas, USA, found the disparity between the level of knowledge and actual practice of universal precautions[10,11] . These studies consistently found that the optimal practice score was less than the level of knowledge of universal precautions among healthcare workers. Several plausible explanations may explain this opposing relationship between the knowledge and practice of universal precautions including the fact that students know the information but translating knowledge into actual practice depends upon many personal attributes including personality, feeling of inconvenience, pressure of work, time limitations, etc.

Conclusion

This study showed a high prevalence of good knowledge and poor practice of universal precautions among medical students in the Faculty of Medicine and raises the need to address these issues during the clinical years. Any gaps in the knowledge and practice of universal precautions among upcoming physicians and surgeons in our and similar settings should be addressed during their formative years and be evaluated subsequently.

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