

Knowledge and Practice on Safety Behaviour of Medical Students Within Microbiology Laboratory in a Private Medical College.

KEYWORDS

personal protection, safety, cleanliness, hand washing, medical students

*Dr. NILOTPAL BANERJEE

Asst. Professor of Microbiology Tripura Medical College & Dr. BRAM Teaching Hospital. Hapania, Agartala. Tripura state (North-eastern region) PIN :- 799014 * Correspondence aurthor

ABSTRACT A questionnaire based study was under taken amongst 300 undergraduate medical students to assess the knowledge and practice on safety behaviour while attending practical classes in Microbiology laboratory From 2014-2015. The questionnaire was based on the domains of knowledge on personal protective measures, cleanliness, hand washing, disinfectants, use of disposable syringes and needles and disposals.

The study revealed that practice of self safety behaviour was not very encouraging. Knowledge of majority of the students of II MBBS in different aspects of the above mentioned domains, especially for hand washing, was found to be poor which can be considered as an alarming signal for prevention of infection and contamination in future practice. The findings of the study indicate that there is a need to develop a system of continuous education for medical students on good laboratory practices and use of safety equipments.

INTRODUCTION: Safety in a microbiological laboratory substantially differs from that in other (chemical or physical, etc.) laboratories. The reason is that in addition to hazardous chemicals and substances which can lead to laboratory work-related risk, there is an added risk of infection while working with microbes.¹ It is necessary for the people, who work in laboratories, are appropriately informed, instructed, trained and supervised and ensure to work safely with recommended requirements. Students of II MBBS course are instructed how to carry out experiments safely and to follow the safety instructions in the beginning every year. They are routinely instructed on the infections related to various microbes, blood particularly on handling culture materials, blood etc. in the light of infectiousness. In spite of guidelines and instructions the primary responsibility of safety rests with the individuals.

The aim of the study was to assess the knowledge and practice of safety behaviour of the MBBS students.

METHODOLOGY:

This was an observational study, based on a questionnaire on the students of II year and III year MBBS course of a private medical college . A validated, anonymous questionnaire consisted of both open and closed ended questions related to their knowledge on safety parameters while working in the laboratory during practical classes and thereby practice was used for the study. The questionnaire was developed on the following domains: (A) Personal protective measures – wearing of lab coats and gloves, (B) Cleanliness – Hand washing, use of disinfectants, knowledge on cleaning and use of glass-wares and tubes and (C) Dealing with wastes, (D) Use of disposable syringes and needles.

A total of 150 students from II MBBS and 150 students from III MBBS /I participated in the study over a period of two years. Exclusion criteria included students of I MBBS, III/ II MBBS and Interns. Data were analysed and expressed in percentage.

RESULTS: A total of 300 students, 150 each from II MBBS and III MBBS of consecutive two batches respond-

ed to the questionnaire study. The overall quantitative responses of the questions on total number of students were not found to be very encouraging.

The analysis of measures of personal protection and safety reflects that the students of II MBBS were much lacking in knowledge and instructions on personal safety as compared to III MBBS. Only 30% of the students were aware of wearing of lab-coat was necessary for self protection from contamination of infective materials as compared to that of III MBBS. Similarly there were less number of students , 51% in II MBBS as compared to 72% from III MBBS, having knowledge on changing of gloves (Table 1).

Areas on personal protection	Correct scores from Stu- dents of MBBS II in % (n = 150)	Correct scores from Students of MBBS III in % (n=150)
Wearing of Labcoat and gloves - necessary as routine discipline	90%	96%
Wearing of Labcoat and gloves - necessary for personal protection	30%	60%
Weekly washing of labcoats	45%	69%
Changing of gloves aftereach exercise	51%	72%
Changing of contaminat- ed gloves immediately	78%	84%

Table 1: Response of the students on knowledge of personal safety and protection measures in Microbiology laboratory

Similar responses were evident with the issue on cleanliness. The overall scores in students of II MBBS were much less than III MBBS. Significantly very less number of students could answer properly on disinfection and sterilization of media and other devices in both the batches (Table 2), so also on dealing with wastes and use of disposable

RESEARCH PAPER

things (Table 3). There was significant lack of information on the existence of WHO laboratory safety manual 2004 $^{\rm 2}$ in both the batches, 3% and 9% respectively(Table 3) and no knowledge on any guideline on waste disposal amongst II MBBS students as compared to III MBBS students.

Table 2 : Response of students on knowledge and practice of Cleanliness

Areas on Cleanliness	Correct scores from Students of	Correct scores from Students of MBBS III
	MBBS II (n = 150)	(n=150)
Knowledge on hand washing	54%	66%
Names of disinfectants used for hand cleansing	28%	42%
Always wash your hands upon leaving the lab	45%	51%
Knowledge on cleaning of Glass wares and tubes	15%	21%
Knowledge on steriliza- tion of medias used	9%	30%

Table 3: Students' Responses on dealing with wastes and disposable materials

Parameters	Correct scores	Correct scores
	from Students of MBBS II (n = 150)	from Students of
		MBBS III (n=150)
Core areas on WHO laboratory safety manual	3%	9%
Superfluous chemicals and biological waste must not be disposed off down the drain or in waste bins	6%	9%
Disposal of syringes, broken glass and other sharp objects in special sharps containers	9%	18%
Main items on Biomedi- cal waste management	0%	9%
Sterilization of re-usable items for re-use	12.5%	18%
Disposal of needles	30%	60%
Sterilization of glass syringes for re-use	30%	60%

Discussion:

Good laboratory practices with responsible behavior at work can prevent most work-related exposures to infectious agents. Epidemiologic analysis of laboratory acquired infections include not only symptomatic infections, but also non symptomatic sero-conversions which can add up further constitution of risks. Therefore, in order to prevent the exposure of the operator, their colleagues, biological safety level requirements in microbiology laboratories is very much necessary.

In this study it was found that the knowledge of the students on bio-safety is significantly less as that of required for routine practice. The reason might be inappropriate training and instruction to the students in a structured way. They should get appropriate training on the potential hazards and preventive measures at the start of the laboratory course, which should be refreshed when applying techniques of (infection) $\ensuremath{\mathsf{risk}}\xspace{3}\xspace{3}$

Proper hand hygiene is the single most important, simplest, and least expensive means of reducing the prevalence of HAIs and the spread of antimicrobial resistance $_{\rm 4,5,6}$

Like in other developing countries, the priority given to prevention and control of HCAI is minimal. This is primarily due to lack of infrastructure, trained manpower, surveillance systems, poor sanitation, overcrowding and understaffing of hospitals, unfavourable social background of population, lack of legislations mandating accreditation of hospitals and a general attitude of non-compliance amongst health care providers towards even basic procedures of infection control. In India, although hand hygiene is practiced as a custom and promoted at school and community levels to reduce the burden of diarrhoea, there is a paucity of information amongst the staffs on activities to promote hand hygiene in hospitals and medical colleges ^{7,8,9}. This study also reflects that there is paucity of knowledge in the practice of hand washing and cleanliness amongst the medical students while working with biological samples and specimens. As there is no other similar type of study, it is not possible to compare the data with the rest of the country. But, in a landmark study on Staphylococcal epidemics in 1950s, Mortimer et al10 showed that direct contact was the main mode of transmission of S. aureus in nurseries.

Improving hand hygiene adherence has been the major focus of the WHO First Global Patient Safety Challenge "Clean Care is Safer Care."¹¹ New guidelines for hand hygiene were developed together with a multimodal implementation strategy to promote system changes and modification of health care workers' behavior.12 The practice of compulsory training on standard precautions, safe hospital practices and infection control for all postgraduates upon course-induction, as is being done in a few Delhi medical colleges seems very promising for our country. Such an exercise and rigorous training may be made mandatory across all medical and nursing colleges of India, especially since the "patient safety" is increasingly being prioritized by the Government of India and the country being one of the 120 signatories pledging support to the WHO launched world alliance.13

Conclusion: The level of lack of awareness of medical students on the risk of infection and the behavioral factors call for an intervention of routine safety programs and safety management in the subject of Microbiology of Indian Medical curriculum. There is a need to develop a system of continuous education for them on laboratory practices and use of safety equipments, that is Good Laboratory Practices (GLP).

Gratitude : The author sincerely expresses gratitude to Dr. Barna Ganguly, Professor & Head, department of Pharmacology, P.S.Medical College, Karamsad, Anand, Gujarat for guidance in the preparation of the manuscript, as it is extremely pertinent in the field of medical & Paramedical education.

References:

 Erika M., Tóth, Andrea K. Borsodi, Tamás Felföldi, Balázs Vajna, Rita Sipos and Károly Márialigeti, (2013). Practical Microbiology: based on the Hungarian practical notes. *Mikrobiológiai Laboratóriumi Gyakorlatok* (pp 6 -10) Eötvös Loránd University.

RESEARCH PAPER

- Volume : 6 | Issue : 3 | March 2016 | ISSN 2249-555X | IF : 3.919 | IC Value : 74.50
- 2. Laboratory Biosafety Manual (2004) World Health Organization: 3rd ed.
- Behaviour and work in a microbiological laboratory. Chapter 2.4 (ttktamop.elte.hu/online-tananyagok/...microbiology/ch01s04.html) accessed on January 2016
- Guide to implementation of the WHO multimodal hand hygiene improvement strategy. Available from:http://www.who.int/patientsafety/en/ ^[accessed on November, 2015]
- Larson E.(1999). Skin hygiene and infection prevention: more of the same or different approaches? *Clin Infect Dis.*;29:1287–94.
- Larson E, (1988). A causal link between handwashing and risk of infection. Examination of the evidence? Infect Control Hosp Epidemiol. ;9:28–36.
- Chandra P, Millind K ,(2001). Lapses in measures recommended for preventing Hospital acquired infection. J Hosp Infect. ;47:218–22.
- Suchitra JB, Lakshmi Devi N, (2007). Impact of education on knowledge, attitudes and practices among various categories of healthcare workers on nosocomial infections. *Indian J Med Microbiol.*;25:181–7.
- Taneja N, Das A, Raman Rao DS, Jain N, Singh M, Sharma M, (2003). Nosocomial outbreak of diarrhea by enterotoxigenic E.coli among preterm neonates in a tertiary care hospital in India: pitfalls in healthcare. J Hosp Infect.;53:193–7.
- Mortimer EA, Wolinsky E, Gonzaga AJ, Remmelkamp CH, (1966). Role of airborne transmission in Staphylococcal infections. BMJ. ;1:319–22.
- Pittet D, Donaldson L. (2005). Clean Care is Safer Care: a worldwide priority. Lancet Oct 8; 366(9493):1246-7.
- National Consultation Workshop on Patient Safety (2010). Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGIMS), Lucknow Technical Report.
- http://www.who.int/patientsafery/events/06/statements/India_pledge. pdf).