JOURNAL OF PURE AND APPLIED MICROBIOLOGY, Nov 2015. Vol. **9**(Spl. Edn. 2), p. 619-622

Awareness about Biomedical Waste Management Among Health Care Personnel of a Tertiary Health Care Centre

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(Received: 14 June 2015; accepted: 20 July 2015)

The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste. Inadequate and inappropriate knowledge about handling of healthcare waste may have serious health consequences and a significant impact on the environment as well.Study was conducted to assess awareness about biomedical waste, its hazards and management among health care personnel. The study was a cross sectional questionnaire based survey. A total of 108 health care workers participated in the study. Study subjects included 23 final year medical students, 28 interns, 12 lab. technicians, 37 nursing staff and 8 lab. attenders.The data collection was done through a standard set of questionnaire, which was developed after literature search and review. The answers were recorded as correct or incorrect response to each question. Over all interns and final year medical students had better awareness of BMW than laboratory technicians and staff nurses. Attenders had least awareness about BMW. Awareness of BMW and its hazard, colour coding of bags was good in all groups of heath care workers (>75%). But knowledge regarding storage time of BMW, reporting of injuries and identification of biohazard symbol was poor in all groups. Awareness regarding BMW management is unsatisfactory in health care personnel. Importance of BMW management should be stressed in the study curriculum of medical and paramedical students. A strategy consisting of a practical oriented training programme along with periodical sensitization sessions regarding safe management of BMW for all health care personnel including lab.attenders of hospital is necessary. Strict supervision and surveillance should be followed in day-today hospital waste management activities.

Key words: Biomedical waste, Health care workers, Hazards.

Biomedical waste (BMW) is the term applied to the waste generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of biological including categories viz general waste, pathological waste, radioactive waste, chemical waste, infectious waste, sharps, pharmaceutical waste, pressurized containers.[1] It is estimated that annually about 0.33 million tonnes of hospital waste is generated in India and, the waste generation rate ranges from 0.5 to 2kg per bed per day.[2] It is important to note that not all hospital waste has the potential to cause biohazard. It is estimated that 80-85% is non infectious general waste, 10% is infectious and 5% is other hazardous waste.[3] However if the infectious component gets mixed with the general non-infectious waste, the entire bulk of hospital waste potentially becomes infectious.[4]

Inadequate and inappropriate knowledge of handling of biomedical waste may have serious health consequences and a significant impact on the environment as well.

Public concern about medical waste dates back to early 1980's when large quantities of syringes and needles were found on the beaches of the East coast and in Florida, USA. In India, the

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concern for BMW has come in to the force in recent years. The Government of India notified the Biomedical waste Rules in July 1998.[5] Though legal provisions exist to mitigate the impact of hazardous and infectious hospital waste on the community, still these provisions are yet to be fully implemented. Since the implementation of BMW management rules, every concerned health care personnel is expected to have proper knowledge, practice and capacity to guide others for waste collection and management.[6] Effective management of BMW is not only a legal necessity but also a social responsibility.

With this background the present study was conducted to assess the awareness of BMW management among health care personnel of a tertiary health care centre.

MATERIALS AND METHODS

The study was a cross sectional questionnaire based survey. The standards of the ethical committee on human experimentation were followed during the study. A total of 108 health care workers participated in the study. Study subjects included 23 final year medical students, 28 interns, 12 lab. technicians, 37 nursing staff and 8 lab. attenders.

The data collection was done through a standard set of questionnaire, which was developed after literature search and review. The questionnaire included 7 questions -1.What is biomedical waste and what are its hazards? 2. How many coloured bags are used to collect biomedical waste? 3. Which are the different biomedical wastes collected in different coloured bags? 4. How biomedical waste is managed based on waste category? 5. According to national guidelines what is the maximum time limit for which biomedical waste can be stored? 6. What should one do if he/she gets injuries due to biomedical waste? 7. Can u identify biohazard symbol among the following?

The answers were recorded as correct or incorrect response to each question.

RESULTS

In the present study a total of 108 health care workers participated. Table – 1 shows the results of study from the questionnaire.

Over all interns and final year medical students had better awareness of BMW than laboratory technicians and staff nurses. Attenders had least awareness about BMW.

Awareness of BMW and its hazard, colour coding of bags was good in all groups of heath care workers (>75%). But knowledge regarding storage time of BMW, reporting of injuries and identification of biohazard symbol was poor in all groups.

DISCUSSION

Health care personnel play a very important role in management of BMW. Lack of awareness about handling of BMW among health care personnel is dangerous not only the staff & patients of the hospital but also to general public and environment.

Awareness about BMW and its hazards was very good in all groups. Even 75% of attenders were aware of hazards of BMW. Similar to present study, study by Madhukumar S et al have reported that all (100%) health care workers were aware about BMW.[7]Padmashree et al have reported that more than 75% among lab. technicians, nurses and sanitary staff were aware of concept of BMW.[8] Mathur V et al reported in their study that 91.6% of nurses, 75.6% of lab. technicians and 21.7% of sanitary staff were aware about transmission of diseases through BMW.[9]

Knowledge regarding number of coloured bags available to collect BMW was good in the present study. Since colour coding of bags is used in our hospital, most of the health care workers were aware of colour coding of bags for different BMW collection. Regarding use of appropriate coloured bags for different BMW, 75% of interns, 73.91% final year MBBS students, 66.66% lab.technicians had fair knowledge. None of attenders knew about it. Pinto VN et al have reported that 31.2% interns had correct knowledge about colour coding of bags.[10] Basu et al study has reported 76.4% junior doctors had knowledge of waste categories.[11]

Table 1. Awareness regarding BMW among health care personnel

S. No.	Awareness regarding BMW	Interns n=28	Final year MBBS students n=23	Lab. Technicians n=12	Nursing Staff n=37	Lab. Attenders n=8
1.	BMW and its hazards	28 (100)	23(100)	12(100)	37(100)	6(75)
2.	Colour coding of bags	26(92.85)	22(95.65)	12(100)	37(100)	5(62.50)
3.	Use of appropriate coloured bags for different BMW	21(75.00)	17(73.91)	8 (66.6)	20(54.05)	0(0)
4.	Management of BMW based on waste category	16(57.14)	16(69.56)	6(50.00)	5(13.51)	0(0)
5.	Maximum time of storage of BMW	8(28.57)	3(13.04)	3(25.00)	1(2.70)	0(0)
6.	Reporting injuries	1(3.5)	0(0)	0(0)	1(2.70)	0(0)
7.	Biohazard symbol identification	2 (7.14)	1(4.34)	1(8.33)	1(2.70)	0(0)

In the present study management of BMW based on category of waste was known to only 57.14% of interns, 69.56% of final MBBS students, 50% of lab.technicians, 13.15% of nursing staff and none (0%) of attenders. Study done in Vishakapatanam revealed that one third of staff were not aware of where the waste from hospital was ultimately treated and disposed of.[12] Study by Mathur V et al has reported that doctors, laboratory technicians and nurses have better knowledge than cleaning (sanitary) staff regarding BMW management.[9]

Knowledge regarding maximum storage time of BMW was poor (over all in all categories less than 26%). Nursing staff and attenders had very poor knowledge (2.70% and 0% respectively). Only 9.5% of the health care workers knew that maximum storage period for BMW, according to national guidelines is 48 hours, in a study by Sanjeev R et al.[6] Padmashree D et al in their study found >40% of paramedical staff to be aware of maximum storage time of BMW.[8]

Knowledge regarding reporting of injuries due to BMW was also very poor among all groups studied (< 4%) in the present study. Stein et al in their study have reported that among doctors and nurses, only 37% reported that they ever suffered from needle stick injury.[13] Low awareness about reporting could be due to the fact that most of the doctors and other paramedical staff are unaware about a formal system of injury reporting, which should be established in all the health care facilities.

The present study also revealed that awareness about biohazard symbol was very poor with maximum of 7.14% among interns and a minimum of 0% among lab attenders. But study by Pinto V.N et al has reported that, in their study 59% of health care workers identified biohazard symbol correctly.[10] Similarly Madhukumar S at al have reported that 86.2% of the health care workers knew about the biohazard symbol.[7]

The present study and most other studies have revealed that interns, medical students lab. technicians and staff nurses had fair knowledge regarding BMW concept, its hazards and use of colour coded bags for collection of BMW. But regarding current knowledge about different categories of waste, use of appropriate coloured bags, storage time, reporting of injuries and identification of biohazard symbol, all groups had poor knowledge. Lab attenders and sanitary workers had very poor knowledge in all matters of BMW.

To conclude, awareness regarding BMW management is unsatisfactory in health care personnel. Importance of BMW management should be stressed in the study curriculum of medical and paramedical students. A strategy consisting of a practical oriented training programme along with periodical sensitization sessions regarding safe management of BMW for all health care personnel including lab. attenders of hospital is necessary.

Strict supervision and surveillance should be followed in day-today hospital waste management activities.

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