

BIO-MEDICAL WASTE HANDLING PRACTICES IN URBAN HEALTH CENTRES OF SURAT MUNICIPAL CORPORATION

Ashish Naik¹, Bhautik Modi², Bansal RK³

¹DPH Student, ²Resident, ³Professor & Head, Department of Community Medicine, Surat Municipal Institute Medical Education & Research (SMIMER), Surat

Correspondence:

Dr. Bhautik Modi

Resident Doctor, Department of Community Medicine,

Surat Municipal Institute Medical Education & Research (SMIMER), Surat

Email: dr_bhautikmodi@yahoo.co.in

ABSTRACT

Background: Biomedical waste consists of solids, liquids, sharps, and laboratory waste that are potentially infectious or dangerous and are considered biomedical waste. It must be properly managed and safely disposed.

Methodology: Cross-sectional study design, consisting of participant observation and interviews, among 20 health centres of Surat Municipal Corporation area.

Results: Our study shows number of bags having inappropriate content was maximum in red bags (50.0%). Among the medical officers and nurse, knowledge regarding proper bag for collection of cotton gauze pieces and empty box is better than all other article.

Conclusion: Healthcare waste management should be supported through appropriate education, training and the commitment of the healthcare staff, management and healthcare managers.

Keywords: Biomedical waste, Urban health centre, Public Private Partnership, Needle

INTRODUCTION

Rapid urbanisation and industrial diversification has led to generation of considerable quantities of municipal, plastic, hazardous and biomedical waste. Government of India define Bio-Medical Waste as any waste generated during the diagnosis, treatment or immunization of human beings or in research activity.¹ Common producers of biomedical waste include hospitals, health clinics, nursing homes, medical research laboratories, offices of physicians, dentists, and veterinarians, home health care, and funeral homes.² World Health Organization 1999 report on health care waste composition in Asian countries reported that India is generating 0.33 million ton biomedical waste per year, means 1-2 kg per day per bed.³

Surat, city located in the southern part of Gujarat, ranks fourth in a global study of fastest

developing cities conducted by The City Mayors Foundation, an international think tank on urban affairs.⁴ Looking to the requirement for establishment of a common biomedical waste treatment facility, Surat Municipal Corporation decided to set up a CBMWT (Common Biomedical Waste Treatment) facility on 'BOOT' (Build, Own, Operate, and Transfer) basis. It is established as Public Private Partnership based project. Envision Enviro Engineers Pvt. Ltd is the private partner selected for establishment of CBMWTF. The facility was made operational in 2003.⁵ Simple guide line to manage proper biomedical waste is reduction in the production of waste, segregation of waste at origin, transport of waste, storage facility and final disposal facility. Thus the role of health worker become important in the proper management and safe disposal of biomedical waste.

On this background, we found it is important to study the scenario of safe disposal of biomedical waste in the city and to study knowledge, attitude and practice regarding the safe disposal of bio-medical waste of health workers in the city. So the study was conducted to assess knowledge and to study bio-medical waste handling practices by health care workers

METHODOLOGY

Cross-sectional study design, consisting of participant observation and interviews, took place over a 2 month period from June 2011 and July 2011. Out of 36 Urban Health Centres of Surat 20 health centres were selected randomly. Minimum 50 % of health centres were selected from each zone so as to make suitable representative of all the health centres of the city. Among these 12 are working as a Maternity

Home. First component was observational in which the field researcher will observe the availability of bio-medical waste collection bag and appropriateness of its content during the morning OPDs of 9:00 a.m. to 01.00 p.m. After observing the bags in the health centre, medical officer, staff nurse, laboratory technician and peon who was involved in the segregation and safe disposal of bio-medical waste procedure was interviewed in private room using pretested questionnaire. Data entry was done in Microsoft Excel and analysis was done using Epi-info software.

RESULTS

Our study of bio-medical waste bio-medical waste handling practices in urban health centres of Surat Municipal Corporation shows findings as below.

Table 1: Availability of bags and appropriateness of its content

Resources	Availability		Content		
	Available (%)	Not Available (%)	Appropriate (%)	Inappropriate (%)	Not Applicable (%)
Red bag	18(90.0)	2(10.0)	8(40.0)	10(50.0)	2(10.0)
Blue bag	7(35.0)	13(65.0)	2(10.0)	5(25.0)	13(65.0)
Yellow bag	18(90.0)	2(10.0)	12(60.0)	6(30.0)	2(10.0)
Black bag	18(90.0)	2(10.0)	11(55.0)	7(35.0)	2(10.0)

Table 1 shows at 65.0% of health centres blue bags were not available. Our study shows number of bags having inappropriate content was maximum in red bags (50.0%). Among all bags, in yellow bags there were least inappropriate contains.

We found bio-medical waste in surroundings of 50% of Health centres. At 25% of places waste was not segregated at the site of generation.

35% of peon, 20% of MO, 10% of nurse and 10% of LT don't know about bio-hazards symbol printed on bags.

Table 2: Knowledge of health worker on category wise distribution of bio-medical waste (n=20)

Bio-medical waste	Correct bag for disposal	Correct response			
		MO (%)	Nurse (%)	LT (%)	Peon (%)
Plastic syringe	Red	65.0	85.0	70.0	70.0
Needle	Blue	65.0	20.0	30.0	30.0
	Puncture proof Container		70.0	20.0	20.0
Catheter	Red	60.0	65.0	35.0	35.0
Cotton gauze Piece	Yellow	85.0	90.0	85.0	85.0
Urine sample	Drainage after treatment	20.0	30.0	55.0	55.0
Used Injection vial	Red	65.0	50.0	55.0	55.0
Empty box of medicine	Black	75.0	65.0	65.0	65.0
	Dustbin	5.0	15.0	25.0	25.0

Table 2 shows, among the medical officers, knowledge regarding proper bag for collection of cotton gauze pieces and empty box is better than all other article. Only 20% of medical officer responded correctly regarding disposal of urine sample.

Among nurses, laboratory technicians and peon, maximum correct response given by nurses was about cotton gauze, needles and empty box of medicine. Only 30% of nurses responded correctly regarding disposal of urine sample. Laboratory technicians and peon have average knowledge about correct knowledge regarding proper bag for catheter and needle.

DISCUSSION

In this study results, table 1 shows availability of colour coded bags at health centre and its appropriate content. Almost all health centres has good supply of bags. But in 65% of centres blue bag is not available. Blue bag is for collection of Waste Sharps (needles, syringes, scalpels blades, glass etc. that may cause puncture and cuts. This includes both used & unused sharps). Instead of blue bag workers are collecting the waste sharps in puncture proof container or jar which are mostly at the site of waste generation. It is good practice and should be recommended to all centres.

The proper segregation is the key to successful biomedical waste management. The waste collected has to be sorted out into the different categories according to the Schedule I of the Biomedical Waste (Management and Handling) Rules, 1998.⁶ In our study, we find contents of bags are inappropriate as per given in table 1. This is a major point of concern. Inappropriate segregation ultimately results in an incorrect method of waste disposal. This may lead to failure of the whole system. This can be improved by intensive training of health worker at all levels. At 25% of health centres, waste is not segregated at the site of generation. This can be hazardous because it can directly or indirectly spread infection to health worker. This waste can spread infection indirectly by contaminating air, water, food or other waste. If waste is not segregated at the site of generation it might be possible someone recycled it which is dangerous and create large epidemic of disease. This is the reason 100% of waste must be segregated category wise at the site of generation.

We found bio-medical waste in surroundings of 50% of Health centres. This denotes breach in the collection of bio-medical waste. This lack of segregation practices, results in mixing of hospital wastes with general waste making the whole waste stream hazardous.

Our study shows 80% of MO and 90% of nurse know about bio-hazards symbol printed on bags. Symbol of bio-hazard should be explain to all health workers. This result is consistent with results of Vanesh Mathur et al. which shows 93.7% of doctors and 92.1% of nurses knows about the symbol of bio-medical waste printed on bags.⁷

In our study we ask health worker about proper bag for different type of bio-medical waste and record their responses. For almost all waste, number of nurses having correct knowledge is more than all other health workers. However, this difference is not statistical significant (p value > 0.05). Table 2 shows almost all health worker has good knowledge regarding proper bag for basic articles like cotton gauze, needle and empty box of medicine. These articles are generally most frequently used. So, added knowledge of proper disposal of other waste could improve the practice. This result is comparable with the result of Savan Sara Mathew et al.⁸ It shows 77.3% of doctors and 73.3% of nurses practices proper disposal of waste in proper colour coded bags.

CONCLUSION AND RECOMMENDATION

Certain deficiencies in the waste management practices of various categories of health workers were identified. To improve this, healthcare waste management should be supported through appropriate education, training and the commitment of the healthcare staff, management and healthcare managers.

Periodic CME sessions in the hospital would help reinforce and update knowledge of the different categories of employees on the subject of BMW management and motivate them to comply with the rules and guidelines regarding BMW management.

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