Research Article

A study on health care waste management by nursing homes in Kalaburgi city

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Abstract

Background: Health care waste is a special category of waste which needs special precautions while handling. Mismanagement of waste affects not just the generators, operators but also the general public. **Objectives:** 1) To study the procedure adopted in the management of health care waste of nursing homes in Kalaburagi city. 2) To provide recommendations for proper healthcare Waste Management. **Methods:** A cross-sectional study was carried out among maternity /nursing homes in Kalaburagi city from December 2008 to November 2009. A total of 44 nursing homes were covered under the study within the limits of Kalaburagi Municipal Corporation. The data was collected using pre tested proforma and was analyzed using percentages and proportion. **Results:** Maternity/nursing homes were grouped into 3 groups. The rate of generation of health care waste was 254.06 grams, 240.65 grams and 240.05 grams per bed per day in group I, group II and group III respectively. All the nursing homes in all the groups carried out the segregation of HCW, however the containment of waste into specified colour coded containers was appropriate in 3(12%), 6(46.15%) and 5(83.33%) nursing homes in Group I, Group II and Group III respectively. **Conclusion:** The overall assessment indicated that, although the maternity/nursing homes in general abide by the prescribed regulations for management of BMW, there is a need to further build the capacity of the nursing homes to develop a model BMW system in their nursing homes.
Keywords: Health care waste; nursing homes, common treatment facility.

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Received Date: 02/08/2015 Revised Date: 13/08/2015 Accepted Date: 16/08/2015

Access this article online	
Quick Response Code:	Website: www.statperson.com
	DOI: 18 August 2015

INTRODUCTION

Health services help communities to achieve good health but also produce a by product which is wasteful and causes contamination of the environment including soil and water with its antecedent complications. It is hazardous to handlers too. The healthcare waste is a special category of waste by virtue of its composition, source of production, and its hazard. This healthcare waste needs to be treated honorably in order to not to cause any harm to the living creatures. A biomedical waste constitutes mainly infectious waste at clinical settings which spreads the diseases like Hepatitis A, HIV, etc. In addition, the sharps such as the needles do cause physical damage. Hence the safe handling and disposal of biomedical waste has gaining attention of not only health care providers but also public health administrators in order to have healthier societies. Almost 70 to 90% of the health care waste is comparable to the domestic waste and the remaining 10 to 25% is hazardous as it may be infectious, toxic and/or radioactive[1]. Generally the quantity of hospital waste generated in India is estimated to be 1-2 kg/ bed/ day in a typical hospital (Bureau of Indian Standards). The no of injections given in India are approximately 300 crores per year out of which 2/3 or 60% are unsafe[2]. Though the waste generated is of minimum quantity, the improper disposal of health care waste has both direct and indirect impacts physical, biological and radiological on those who work in the health care settings and also general public. As a prelude to safe disposal, one requires to know the quantity and quality of health care waste which is an essential requirement for planning and execution of the safe

How to site this article: Pallavi V Tenglikar, Kaviraj Motakpalli, Rajashekhar Kapate, Mubeen Hussain. A study on health care waste management by nursing homes in Kalaburgi city. *International Journal of Recent Trends in Science and Technology* August 2015; 16(1): 182-185 http://www.statperson.com (accessed 20 August 2015).

disposal of biomedical waste. Though the Government of India has passed/enacted a law with appropriate rules on Biomedical Waste (Management and Handling) Rules, 1998 the disposal is still inadequate in many places. The Kalaburagi city is a fast growing urban area with mushrooming of various categories of health services. A modest attempt has been made to know the biomedical waste management in the health care setting.

OBJECTIVES

1) To study the procedure adopted in the management of health care waste of nursing homes in Kalaburagi city.
2) To provide recommendations for proper healthcare Waste Management.

MATERIAL AND METHODS

A cross-sectional study was carried out among maternity /nursing homes in Kalaburagi city from December 2008 to November 2009. A total of 44 nursing homes were covered under the study within the limits of Kalaburagi Municipal Corporation.

Inclusion Criteria

All Maternity and Nursing Homes providing mainly maternity services with other nursing care were included in the study.

Exclusion Criteria

1. Medical college hospitals and Government general hospital are excluded due to adherence to biomedical waste disposal law. All other health care centres other than maternity and nursing homes providing specialty services such as paediatric, ENT, optho, ortho and general medicine are excluded.
2. Dental Hospitals and clinics
3. Clinics (OPD service only) and Laboratories
4. Veterinary Hospitals, AYUSH health care settings and other non allopathic institutions are excluded from the study.

Method of Collection of Data

A checklist was prepared to conduct the study and was tested for appropriateness in a few nursing homes during the pilot study. Data collection was carried out by visiting maternity and nursing homes and a rapport was established with the heads and staff of the nursing homes. The purpose of the study was explained and cooperation was requested to conduct the study in their health care centres. Data pertaining to the treatment and disposal processes at the Common Healthcare Waste Appropriate Management Plant (CHAMP), a Common Treatment Facility for biomedical Waste management responsible for collection and disposal of medical wastes and from health officials was also collected. The facility is located at village Sharanasirasi of Kalaburagi district at approximately 10 kilometers away from the city. An onsite visit of the biomedical waste treatment facility was undertaken to study the processes involved in treatment and disposal activities at the facility as per the Biomedical Wastes Management and Handling Rules 1998.

Statistical Methods: Data was tabulated and analyzed using percentages and proportions

RESULTS

Table 1 shows the distribution of the 44 maternity/nursing homes into 3 different groups for descriptive purpose. Group I includes nursing homes with bed strength<10, Group II consists of nursing homes with bed strength between 10 to 19 and Group III with bed strength≥20. The minimum bed strength of any maternity/nursing home is 2 and maximum is 60 Table 2 reveals that the rate of generation of health care waste is 254.06 grams, 240.65 grams and 240.05 grams per bed per day in group I, group II and group III respectively. It is seen from table 3 that all most all the nursing homes carried out the segregation of HCW. However the containment of waste into specified colour coded containers was appropriate in 3 (12%), 6 (46.15%) and 5 (83.33%) nursing homes in Group I, Group II and Group III respectively. Reasons for not using the appropriate containers in majority of nursing homes were reported to be due to disparity between the size of the containers and plastic bags available at the market. Disinfection and disfigurement of infected plastics and metal sharps is not carried by any of the nursing homes. A special transport vehicle collects the waste from these nursing homes to the Common treatment facility site. It was also found that all the nursing homes under the study are registered with common treatment facility. Treatment and disposal is carried out at common treatment facility site were;

- Incinerator for treatment of anatomical and infectious wastes.
- Deep Burial as a stand by option in case of breakdown or maintenance of incinerator at the site.
- Autoclave for treatment of plastic waste like syringes, gloves, disposable aprons, masks, blood bags etc.
- Metal Sharp Manager for treatment of waste metal sharps like scalpels, needles etc.
- Secured landfill, deep burials and composting pits for disposal of the waste.

Table 4 reveals that in the study groups the practice of disinfection before its disposal i.e. appropriate management of liquid waste was observed only in 6(24%) and 3(23%) nursing homes of Group I and Group II respectively. Management of liquid waste was inappropriate in Group III. From the table 5 it is observed

that Gloves were used universally i.e. 100% by all the housing staff in all the study groups. In addition to gloves only 6 (13.6%) of nursing homes i.e. 4 in group I, 1 each in group II and III used aprons as personal protective measures. Masks were used by 17(38.6%) nursing homes i.e. 8 (32%) in Group I, 5 (38.5%) in Group II and 4 (66.7%) in Group III.

Table 1: Distribution of maternity/nursing homes as per bed strength

Groups	Bed strength	Number
I	<10	25
II	10 – 19	13
III	≥ 20	06

Table 2: Quantity of health care waste generated in the various study groups

Groups	Quantity in grams /day/ bed					Total in gms
	Red (cat 7)	Yellow (cat 1and6)	Metal container* (cat 4)	Blue** (cat 4)	Black (cat 5)	
I	43.98 (17.31%)	144.00 (56.68%)	0.51 (0.20%)	63.97 (25.18%)	1.60 (0.63%)	254.06 (100.00%)
II	40.43 (16.80%)	132.00 (54.85%)	2.24 (0.93%)	64.28 (26.71%)	1.70 (0.71%)	240.65 (100.00%)
III	40.83 (17.00%)	135.26 (56.35%)	3.6 (1.50%)	58.16 (24.23%)	2.2 (0.92%)	240.05 (100.00%)

*Metal container (cat4): includes metal-sharps and needles, **Blue (cat4): includes Glass sharps

Table 3: Management of health care waste (other than liquid waste) in study groups

Groups	Segregation	Colour coding		Disinfection and Disfigurement	Transportation	Treatment and final disposal
		Appropriate containers*	Semi appropriate containers**			
I n=25	25 (100%)	3 (12%)	22 (88%)	0	CEE-CHAMP Vehicle	CHAMP CTF site
II n=13	13 (100%)	6 (46.15%)	7 (53.85%)	0	Do	Do
III n=6	6 (100%)	5 (83.33%)	1 (16.67%)	0	Do	Do

*Appropriate containers include specified colour coded plastic bags placed in colour coded plastic buckets with lids as per BMW rules
**Semi appropriate containers includes specified colour coded plastic bags placed in either colour coded or non colour coded plastic buckets without lids

Table 4: Management of liquid waste in the study groups

Groups	Disinfection	Disposal(sewage)	Appropriate Management
I n=25	6 (24%)	25 (100%)	6 (24%)
II n=13	3 (23%)	13 (100%)	3 (23%)
III n=6	0 (0%)	6 (100%)	0 (100%)
Total N=44	**9 (20.5%)**	**44 (100%)**	**9 (20.5%)**

Table 5: Personal protective measures used by the housing staff in the study groups

Groups	Apron	Boots	Masks	Goggles	Gloves
I n=25	4 (16.0%)	0 (0%)	8 (32.0%)	0 (0%)	25 (100.0%)
II n=13	1 (7.7%)	0 (0%)	5 (38.5%)	0 (0%)	13 (100.0%)
III n=6	1 (16.7%)	0 (0%)	4 (66.7%)	0 (0%)	6 (100.0%)
Total N=44	**6 (13.6%)**	**0 (0%)**	**17 (38.6%)**	**0 (0%)**	**44 (100.0%)**

DISCUSSION

With regard to the quantity of waste Singh K *et al.*[3] (2004) in their study done in the various medical establishments in the urban and rural areas of the U.T. Chandigarh found that bio-medical waste generation rate varied between 0.06 kg/day/bed to 0.25 kg/day/bed. Whereas Al-Khatib IA *et al.*[4] (2009) in their study in the hospitals of Nablus city, Palestine found that the medical waste generation rate in kg per bed per day was between 0.59 and 0.93 kg bed (-1) day (-1). The higher percentage of category 1 and category 6 wastes found in this study may be due to the service profile and specialist services (maternity service) provided by the maternity/nursing homes. The differing quantum of metal sharps may be due to existing injection practices and patient profile. In comparision to the present study Vijaya Kumar Goddu *et al*[5] (2007) in their study done at King George Hospital Visakhapatnam, AP found that segregation of waste was carried out in just two colour coded bags namely red and yellow. Red coloured bags included IV sets, sharps and other infected plastics. Yellow coloured bags included

anatomical, pathological and laboratory cultures. The colour coded bags with respective waste were collected and transported in secured vehicles by personnel from Maridi Eco industries (Andra) Pvt Ltd, which is a common treatment facility at Kapuluppada, Visakhapatnam. Rao PH[6] (2008) in a study carried out in hospitals/nursing homes and private medical practioners in urban and rural areas in three states of India found that the access to common waste management was low at about 35%. The 100 percent utilization of common treatment facility in the present study may be due to stringent implementation of rules in this area. Chetan B *et al*[7] (2006) in their study reported that only 10% of health care settings were attempting disinfection of liquid waste prior to discharge into public sewage system. The higher percentage of liquid waste management seen in present study may be due to higher awareness or stringent implementation of the rules over a period of time. Rasheed S *et al*[8] (2005) reported that only 25% of hospitals in their study provided essential protective gears to its waste handlers. Chetan B *et al*[7] (2006) in their study found that, the use of protective measures by housing staff was not in agreement with the standards in 70% of the hospitals. Universal use of complete protective equipments by all staff was deficient in the present study which may be due to cost factor or not aware about the complete hazards of handling HCW.

CONCLUSION

The overall assessment indicated that, although the maternity/nursing homes in general abide by the prescribed regulations for management of BMW, there is a need to further build the capacity of the nursing homes to develop a model BMW system in their nursing homes.

RECOMMENDATIONS

1. All the head of the health care institutions with their staff must undergo awareness programme and regular training including demonstration programme to keep abreast with the current knowledge of scientific waste management system and its importance and benefits to the patients, staff and the community as a whole.
2. Occupational health and safety of the health care personnel should assume importance since it is the health care personnel who would be at immediate risk if waste were mismanaged.
3. There should be a reliable accounting and documenting system for the various categories of waste generated, occurrences of injuries, illness and accidents (during handling of waste), consumption of disinfectants and related materials. This will help to identify the strengths and weakness in the system and therefore scope for improvement.
4. Issues in the financial, administrative and technical aspects should be further examined.
5. Personal protective equipments / accessories should be provided to waste handling staff.
6. Periodical monitoring and surveillance of health care waste management practices should be conducted.
7. The entire waste management practices should be a part of total hygiene practice of the society rather than confining to hospital and health facility.

REFERENCES

1. Pruss A, Cirouit E, and Rushbrook P. Safe management of wastes from health care activities, World Health Organization, Geneva, 1999. [PDF]
2. Training module. Model Injection Centre, India CLEN Program Evaluation Network 2007:4-5.
3. Singh K, Arara SK, Dhadwal PJ, Singla A, John S. "Biomedical waste management in the U.T., Chandigarh". J Environ Sci Eng. 2004 Jan; 46(1): 55-60. [WebLink]
4. Al-Khatib, Al- Qaroot YS, Ali-Shtayeh MS. "Management of healthcare waste in circumstances of limited resources: a case study in the hospitals of Nablus city, Palestine". Waste management and research: the journal of the International Solid Waste and Public Cleansing Association, ISWA. 2009 Jun; 27(4):305-12. [PubMed]
5. Vijaya Kumar Goddu, Kavita Duvvuri and Vidya Kaumudini Bakki. "A Critical Analysis of Healthcare Waste Management in Developed and Developing Countries: Case Studies from India and England". Proceedings of the International Conference on Sustainable Solid Waste Management, Chennai, India. September 2007: 134-41. [ResearchGate]
6. Rao PH. "Hospital waste management--awareness and practices: a study of three states in India". Waste management and research: the journal of the International Solid Waste and Public Cleansing Association, ISWA. 2008 Jun; 26(3): 297-303. [ResearchGate]
7. Chetan B. Bhat, Girish N, Pruthvish S, Gopinath D. "Evaluation of in-house systems of Health Care Waste Management in intervened Health Care Settings of the Malleshwaram Pilot Project" Journal of ISHWM. 2006 April; 5(1):31-5.
8. Rasheed. S, Iqbal. S, Baiq LA, Mufi K. "Hospital Waste Management in the teaching hospitals of Karachi". J Pak Med Assoc. 2005 May; 55(5):192-5. [PubMed]

Source of Support: None Declared
Conflict of Interest: None Declared