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A Cross Sectional Study on Handling of Hospital Waste Among Health Care Providers at Primary and Tertiary Levels of Health Care in Tamilnadu.

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ABSTRACT

A Cross sectional study on handling of hospital waste among health care providers at primary and tertiary levels of health care in Tamil Nadu

Introduction

Hospital waste is a potential reservoir of pathogenic micro-organisms and requires appropriate, safe and reliable handling. Appropriate disposal of hospital waste is essential for safety and well-being of the health care providers, patients and the visitors. Keeping in this in mind, this study was carried out to find out the various aspects of biomedical waste disposal system at various levels.

Objectives

The objective of this study is to find the methods of segregation of hospital waste among health care providers at primary & tertiary levels of health care.

Methodology

A cross sectional study was done on "methods of handling of hospital waste" among Health Care Providers (Doctors, nurses, lab technicians, sanitary workers) in 2 tertiary medical college hospital (Private and Government medical college Hospital) and in 16 upgraded/ block Primary Health Centres (PHCs) of Thiruvallur district. The total subjects included in the study were 1178 health care providers. The data was analysed by SPSS-16. Proportion & chi square test was used to assess the statistical significance at 5% α.

Results

The number of subjects included for the study in private tertiary medical college hospital were 485(41.2%), and in Government tertiary medical college hospital were 571(48.5%) and in PHCs were 122(10.3%) with a total of 1178 health care providers. Majority of the bio medical waste containers were labelled in Government hospital (93.2%) followed by private hospital (93.2%) and in PHCs (68%). Among the health care providers, separate containers for biomedical waste were used by 95.7% in private hospital, 90% in Government hospital and 73.8% in PHCs. This difference is found to be statistically significant (p= 0.0001).

Conclusion

Segregation of waste at source is a single most important step in bio-medical waste management which helps in reducing the quantity of wastes to be treated. Frequent periodic training programs should be conducted among the health care providers to improve their knowledge and adoption of proper methods of handling of hospital waste.

KEYWORDS Health Care providers,BioMedical Waste,Segregation

Introduction

Hospital waste is a potential reservoir of pathogenic micro-organisms and requires appropriate, safe and reliable handling. India generates around three million tonnes of medical wastes every year and the amount is expected to grow at eight per cent annually[1]. The average quantity of hospital solid waste produced in India, as assessed by various researchers is in the range of 1.5- 2 kgs/bed/ day[2]. In developed countries, due to the increasing use of disposables, the waste produced is as much as 5.24 kgs/ day[3]. WHO stated that 85% of hospital wastes are actually non-hazardous, around 10% are infectious and around 5% are non-infectious but hazardous wastes. In India, infectious waste could range from 15% to 35%

Segregation of waste at source is a single most important step in bio-medical waste management. Segregation at source helps in reducing the quantity of wastes to be treated. Once bio-medical waste mixes with general waste, the waste management problem magnifies and becomes unmanageable. The waste should be segregated at the point of generation itself[4].

The segregation must be applied from the point of generation, during collection, transport, storage and final disposal. Without effective segregation system, the complete waste stream must be considered as hazardous[5].

This study was done to know the proportion of health care providers adopting the appropriate methods of handling hospital waste and the reasons for non adoption.

Objectives

To find out the methods of handling of hospital waste among

health care providers at primary & tertiary levels of health care.

Methodology
A cross sectional study was done on "methods of handling of hospital waste" among Health Care Providers (Doctors, nurses, lab technicians, sanitary workers) in 2 tertiary medical college hospital (private and Government medical college Hospital) and in 16 upgraded/ block Primary Health Centres of Thiruvallur district. All the eligible health care providers were included in the study; hence no sampling method was used. The data was collected over a period of 6 months from November 2009 to April 2010. The study was approved by the members of the institutional ethics committee. After obtaining the informed consent, data was collected as per questionnaire.

The total subjects included in the study were 1178 health care providers. The data was analysed by SPSS-16. Proportion & chi square test was used to assess the statistical significance at 5% α.

Eligibility criteria
All the health care providers whose experience had more than 1 year of experience and gave informed consent for the study were included in the study.

Results
A cross sectional study was done on adoption of "standard precautions" among Health Care Providers (Doctors, nurses, lab technicians, sanitary workers) in private and Government medical college Hospital and in 16 upgraded/ block Primary Health Centres (PHCs) of Thiruvallur district.

In private tertiary there were 215 doctors, 232 nurses, 64 lab technicians and 50 sanitary workers of which 5 doctors, 30 nurses and 5 lab technicians had experience < 1 year and 4 doctors, 2 nurses were on long leave and 16 doctors,10 nurses and 4 sanitary workers refused to participate in the study. Hence they were not eligible for the study.

In Govt tertiary, there were 214 doctors, 326 nurses, 26 lab technicians and 70 sanitary workers of which 10 doctors, 11 nurses and 5 sanitary workers had experience < 1 year, 10 nurses were on leave during my data collection period and 14 doctors, 6 nurses and 5 sanitary workers refused to participate in the study. 4 lab technicians were deputed to the PHCs. Hence they were not eligible for the study.

In PHC's there were 35doctors, 65nurses, 17lab technicians and 12 sanitary workers which constitute to 129 heath care providers of which 2 nurses were not eligible and 3 doctors, 2 nurses were not willing to participate in the study.

Hence the number of subjects included for the study in private tertiary were 485(41.2%), and in Govt tertiary were 571(48.5%) and in PHCs were 122(10.3%) with a total of 1178 health care providers.Details given in Table No.1

Handling of the bio medical waste
Use of separate containers for biomedical waste among the health care providers was highest in Private tertiary (95.7%) followed by Govt tertiary and by PHCs. The difference is found to be statistically significant (p= 0.0001) (Table 2). Among the health care providers, in Private tertiary 15(3.1%) occasionally and 6(1.2%) never used separate containers for biomedical waste. In Govt tertiary 45(7.9%) occasionally and 12(2.1%) never used separate containers for biomedical waste. In PHCs 5(4.1%) occasionally and 27(22.1) never used separate containers for biomedical waste. Details given in Table No.2

Labeling of bio medical waste containers
Majority of the bio medical waste containers were labeled in Government tertiary (93.2%) followed by Private tertiary and in PHCs. The difference is found to be statistically significant (Table 3). Even though the containers were labeled, the label got faded after continuous use; hence some sanitary workers were finding it difficult to segregate the waste correctly. Details given in Table No 3

Bio Medical Waste disposal among Health Care Providers
Among the HCPs, BMW disposal was done appropriately by lab technicians in private tertiary, sanitary workers(96.7%) in govt tertiary and doctors(87.5%) in PHCs. The reasons for inappropriate disposal were Labels got faded/ not available, Containers not available at all places, Containers not color coded and Lack of knowledge. Details given in Table No 4

Among 405 HCPs, who attended the training in private tertiary, appropriate BMW management practices were carried out by 390(96.5%). Among 474 HCPs, who attended the training in GRH, appropriate BMW management practices were carried out by only 470(97.3%).(Table5). Among 72 HCPs who attended the training in PHCs, appropriate BMW management practices were carried out by 65(89.0%) Details given in Table No 5.

Discussion
Use of separate containers for biomedical waste was 95.7% in private tertiary, 90% in government tertiary and 73.8% in PHC's which is comparable with the study done in urban dispensaries at Delhi, where color coded bags were used by 90.6%[6]

Appropriate waste disposal in color coded bin was among 77.3% doctors, 73.3% nurses, 78.2% lab technicians and 24.2% sanitary workers in a study done at Allahabad[7], which was comparable with the health care workers in PHCs and high among teriary hospitals.

Adoption of standard precautions should be 100% as per norms, but values in the present study were far from it indicating the necessity of interventions to improve the same. Frequent training programs should be conducted among the health care providers to improve their knowledge and awareness of standard precautions. All facilities needed for 100% adoption of the standard precautions should be made available to the health care providers.

Conclusion:
Segregation of waste at source is a single most important step in bio-medical waste management which helps in reducing the quantity of wastes to be treated. Frequent periodic training programs should be conducted among the health care providers to improve their knowledge and adoption of proper methods of handling of hospital waste.

Table 1: Type of health care providers

Type of HCPs	Private tertiary		Govt tertiary		PHCs	
n		%	n	%	n	%
Doctors	190	39.2	190	33.3	32	26.3
Nurses	190	39.2	299	52.4	61	50.0
Lab technicians	59	12.1	22	3.8	17	13.9
Sanitary workers	46	9.5	60	10.5	12	9.8
Total	485	100.0	571	100.0	122	100.0

Table 2: Regular use of separate containers for biomedical waste

Institution	n	%	95%CI	p value
Private tertiary	464	95.7	93.6-97.2	0.0001
Govt tertiary	514	90.0	87.4-92.3	
PHCs	90	73.8	65.4-81.0	

Table 3: Labeling of bio medical waste containers

Institution	n	%	95%CI	p value
Private tertiary	449	92.6	90.0-94.7	0.0001
Govt tertiary	532	93.2	90.9-95.0	
PHCs	83	68.0	59.4-75.8	

Table 4: Appropriate BMW disposal among HCPs

HCPs	Private tertiary		Govt tertiary		PHCs	
	n(%)	95% CI	n(%)	95% CI	n(%)	95% CI
Doctors	178(93.6)	90.2-97.1	165(86.8)	82.0-91.6	28(87.5)	76.0-98.9
Nurses	179(94.2)	90.9-97.5	277(92.6)	89.7-95.6	47(77)	66.5-87.6
Lab technicians	59(100)		14(63.6)	43.5-83.7	10(58.8)	35.4-82.2
Sanitary workers	44(95.7)	89.8-101.5	58(96.7)	92.1-101.2	5(41.7)	13.8-69.6

Table 5: Appropriate BMW disposal practices among those trained

Training	Private tertiary		Govt. tertiary		PHCs	
	n	%	n	%	n	%
Adequate	390	96.5	470	97.3	65	89.0
In adequate	14	3.5	13	2.7	8	11.0
Total	404	100.0	483	100.0	73	100.0

REFERENCES

1. Bio medical waste management- C.P.R. Environmental education centre http://www.cpreec.org/pubbook-biomedical.htm | 2. Patil AD, ShekdarAV. Health care waste management in india. J Environ manage. 2001;63:211-20.[PubMed] | 3. Indian society of hospital waste management http://www.medwasteind.org/random.asp Apr 12, 2015 | 4. The key for waste management – Waste segregation ee.hnu.cn/eeold/.../hospital/.../handout.../1.3.3%20-%20Segregation.pdf | 5. Biomedical waste management and handling rules 2013 http://envfor.nic.in/legis/hsm/biomed.html | 6. Sandeep Sachdeva, Utsuk Datta Sharp disposal practices in urban dispensaries ijcm.Year 2010, Volume 35, Issue 2, Page : 365-366 | 7. Vanesh Mathur, S Dwivedi, MA Hassan and RP Misra knowledge, attitude and practice about biomedical waste management among healthcare personnel: A cross sectional study. Indian J Community Med. 2011 Apr-Jun; 36(2): 143-145 |