



Knowledge Attitude and Practices Regarding Biomedical Waste Management Amongst Doctor's Nurses , Technician's of Ot & Icu – A Pre & Post Intervention Analysis

Dr Abhilekh Jain

Associate Professor, Department of Anesthesiology, People's College of Medical Sciences & Research Centre, – 462037

Dr Vaishali waindeskar

Professor, Department of Anesthesiology, People's College of Medical Sciences & Research Centre, – 462037

Dr Prashant Sharma

Senior Resident, Department of Anesthesiology, People's College of Medical Sciences & Research Centre, – 462037

Dr Perwez Khan

Assistant Professor, Department of Anesthesiology, People's College of Medical Sciences & Research Centre, – 462037

Dr Sheetal Songir

Associate Professor, Department of Anesthesiology, People's College of Medical Sciences & Research Centre, – 462037

ABSTRACT

Aim : To conduct a pre and post intervention analysis of knowledge attitude and practices regarding biomedical waste management amongst doctor's nurses , technician's of ot & icu

Methodology: Study was carried on the doctors, staff nurse, technicians, working in OT & ICU of PCMS & RC Bhopal 750 bedded Tertiary care hospital .Scientifically designed questionnaire was distributed to the doctors, nurses and technicians of OT & ICU, were explained about the questions & responses were marked.

Results.: The results of questionnaire analysis before intervention session shows that doctors, nurses and technicians had least knowledge about rules & regulations of biomedical waste management ie, 10%,7.5% and 5% respectively, As shown in table 3.Also knowledge about practices regarding BIO MEDICAL WASTE MANAGEMENT at institute level was 32.5%,27.5% and 30% in doctors, nurses and technicians respectively. Knowledge about fundamentals of BIO MEDICAL WASTEM found good in doctors(64%), nurses(41%) and technicians(46%). The results of questionnaire analysis after intervention session shows that doctors, nurses and technicians scores improved significantly in all aspects of knowledge.

Conclusion: Knowledge regarding biomedical waste management plays a key role in safe disposal of biomedical waste .Proper intervention through training programmes at regular time interval has global influence on safe biomedical waste management practices. Training programmes not only increase knowledge and awareness among health care professionals but also develops sense of responsibility which reflects in their attitude and practices.

KEYWORDS :Bio Medical Waste;Training ;gazette ;hazardous

INTRODUCTION

OT & ICU are places where the BIO MEDICAL WASTE generated is highly infectious & hazardous in nature since the staff is over burden with their routine work the issue of safe BIO MEDICAL WASTE MANAGEMENT is often neglected. Over the past few decades there have been tremendous advancements in the health care system. However it is ironic that the health care centers, which are meant to restore & maintain the health & wellbeing of the society, now threaten their wellbeing. Poor management of biomedical waste poses a huge risk to the health of patients. Doctors, nurses, ward boys & all those involved in the care of the patient.

For the first time BIO MEDICAL WASTE MANAGEMENT was discussed by World health organization regional office for Europe at Bergen, Norway in 1983. The seriousness of the issue was brought to limelight during the "beach wash-ups" on coast of Florida & gulf in 1988. With the passage of time the problem has evolved as a global humanitarian issue. In our country, this issue has attracted the attention of the Hon'ble supreme court of India and guidelines have been issued. The Bio Medical Waste Rules 1988 lay down clear methods for disposal of bio-medical waste. BIO MEDICAL WASTE is Defined as "Any waste generated during diagnosis, treatment, immunization of human being or animals or research activities used in the production & testing of biologicals." Pollution control boards of every state have been given the task of authorizing and implementing the rules. In the present study we tried to asses knowledge attitude and practices regarding bio-medical waste management among the OT & ICU staff and analyzed the changes in above after intervention.[1,2]

METHODOLOGY

Study was carried on the doctors, staff nurse, technicians, working in OT & ICU of PCMS & RC Bhopal 750 bedded Tertiary care hospital. Scientifically designed questionnaire was distributed to the doctors , nurses and technicians in OT & ICU, were explained about the questions & responses were marked . Cross sectional surveys through the questionnaire & discussion were done to assess the knowledge and attitude, observational surveys were conducted by the team to assess the practices. After noting the responses of the questionnaire, intervention was made by conducting interactive sessions with audio-visual aids to provide basic knowledge about safe management of BIO MEDICAL WASTE. After this intervention a self assessment test (SAT) was given followed by the session & finally SAT was reviewed.

Table .1: Distribution of Groups

Category	OT			ICU		
	M	F	Total	M	F	Total
Doctors	14	8	22	9	3	12
Nurses	4	28	32	7	11	18
Technicians	17	3	20	5	1	6
Total	35	39	74	21	15	36

Table.2: Demographic Characteristics.

Variable	Doctors (34)	Nurses (50)	Technicians (26)
----------	--------------	-------------	------------------

Age : < 25. 25-34. 34-44. > 45.	8 16 6 4	24 14 8 4	13 10 3 -
Gender : Male. Female.	23 11	11 39	22 4
Education : Primary. Secondary. Graduation. Post Graduation.	- - 9 25	- - 42 8	- - 25 1

Table 3 : Comparison between various pre-test and post-test values

SN	Knowledge	Doctor (n=34)			Nurses (n=50)			Technicians(n=26)		
		Pre test mean	Post test mean	P Value	Pre test mean	Post test mean	P Value	Pre test mean	Post test mean	P Value
1	Knowledge about environment and pollution	3.12	5.09	0.0001	2.04	3.32	0.0001	2.38	3.50	0.0001
2	Knowledge about fundamentals of bio-medical waste management	4.71	7.18	0.0001	4.06	6.46	0.0001	3.92	5.73	0.0001
3	Knowledge about practices regarding BMW at institute level	1.53	2.56	0.0001	1.36	2.78	0.0001	1.31	2.81	0.0001
4	Knowledge about Re-garding individuals level	3.01	5.02	0.0001	2.26	3.40	0.0001	2.2	3.6	0.0001
5	Knowledge about Rules and regulation	1.4	2.2	0.0001	1.28	2.64	0.0001	1.28	2.78	0.0001

P value and statistical significance:

The two-tailed P value is less than 0.0001

By conventional criteria, this difference is considered to be extremely statistically significant.

RESULTS:

Study conducted with total 110 including 34 doctors,50 nurses and 26 technicians working in OT & ICU. The demographic characters in relation to age, gender and education are shown as table 1&2.

The results of questionnaire analysis before intervention; session

shows than in doctors, nurses and technicians,nurses had least knowledge about rules & regulations of biomedical waste management. . As shown in table 3

Also knowledge about practices regarding Bio Medical Waste at institute level was not adequate in doctors, nurses and technicians respectively. Knowledge about fundamentals of Bio Medical Waste found good in doctors as compared to nurses and technicians. The results of questionnaire analysis after intervention session shows that doctors, nurses and technicians scores improved significantly in all aspects of knowledge.

The questionnaire analysis of attitude before intervention shows that all the 3 groups of doctors, nurses and technicians were in consensus that safe disposal of Bio Medical Waste is an issue. There was misconception in all 3 groups that Bio Medical Waste is responsibility of institute mainly ,and subjects of all 3 groups feel that Bio Medical Waste puts extra load on them.Majority in 3 groups ie doctors(25), nurses(37) and technicians(17) would like to get some training on Bio Medical Waste Post intervention analysis shows that majority of subjects in all 3 groups agreed that Bio Medical Waste is an important issue that should be dealt collectively by both individual and institute. It is the part of duty & not an extra load on them.

Assessment of practices was mainly done by observing different tasks at defined locations. Observation were made for waste segregation,storage and handling of sharps.Observation reports of practices before intervention session showed that

Out of 21 locations observed with total duration of 51.5 hours shows that nurses had best score rating of 80 in handling of sharps .Whereas technicians and doctors scored 60 and 30 respectively on a scale of 0-100. Scores for segregation of waste were 20, 60 and 30 in doctors nurses and technicians respectively. Scoring in regard to storage were 20, 50 and50 in doctors nurses and technicians respectively.Doctors performed poorly in the practice of segregation,storage and handling of sharps among all 3 categories After the intervention session observation of practices were done at 29 locations with total duration of72.5 hours.There was improvement in all 3 categories ie doctors nurses and technicians in relation to segregation, storage and handling of sharps.Doctors showed maximum improvement after the intervention session.

DISCUSSION

In a large developing country like India, Where there is big and complicated health care system, mixed economy, private and government hospitals working together; there is a requirement of proper handling of Bio Medical Waste

Till July 1998 these was no proper system & hospitals were disposing their Bio Medical Waste along with general waste. To cater the above problem the Government of India launched a new law 'Bio Medical Waste law' in 1998, which laid specific guidelines [1]. Now its disposal is time scheduled requires treatment facilities like incinerators auto-claves, microwave systems etc. [2]

The present study was undertaken with objectives of finding out the level of knowledge of doctors and other hospital staff about Bio Medical Waste and to train them about effective waste management. The heart of law is segregation at its origin. Segregation potentially infection material from other waste at the point of generation may reduce both volume and cost.

The study revealed that there is s huge gap & lack of knowledge about waste management amongst the doctors. They know about the existence of law related to Bio Medical Waste but details were not known. Doctors were aware of risk of HIV, Hepatitis B & C whereas auxiliary staff had poor knowledge about it. The waste management was not effective neither at collection, transportation nor at disposal. There is therefore an urgent need to train and educate all doctors and staff to adopt effective waste management practices by rigorous training programmes.

Various studies about the awareness and practices of Bio Medical Waste management had since been undertaken in few states of India. NB Pandit et al did their study in a district of Gujrat [3] Waseem

Qureshi, K Naseer et al did their work in Government SMHS hospital Shrinagar which is a tertiary level hospital in Kashmir Valley. They did their study on the awareness of Bio Medical Waste Management amongst staff. [4]

Similar study was done by S. Madhukumar et al in a medical college hospital in Bangalore. [5] A. Sharma, V Sharma et al did their part by studying Bio Medical Waste management among various health care personal in Jaipur city's various hospital, [6]

A report by PH Rao et al compared the management practices of Bio Medical Waste in three states of India. This was by far the largest & comprehensive study done in India which also pointed out the gap between training and implementation of Bio Medical Waste management. [7] AP Ananth et al took a leap forward and studied various way and aspects of Bio Medical Waste management in ASIA as whole. [8]

Since it is a global problem, studied on awareness and safe disposal of Bio Medical Waste has been undertaken individually by many countries. M. Askarian, M. Vikili did their studies in private hospitals in Iran. Their survey was instrumental in beginning of training programs of various health personally. [9] Z. Yong, X. Gang et al did a case study on 13 Min management in Nanjing China and found similar results as H. Anicetus, S.V. Manyele in Tanzania Hospitals. Everywhere there is a huge gap between knowledge and implementation. They recommended to implement the need based training programme. We also revealed the need of intervention educational sessions for improvement in knowledge, attitude and practices [10,11]

In our study we found a distinct improvement after the healthcare personnel trained in Bio Medical Waste management. This was in consensus with studies done by G.V. Patil, V. Mathur et al, Y. Saraf et al. who stressed importance of awareness of Bio Medical Waste management among health care professionals. They also observed that majority lack environmental consciousness and attitude needed to protect their environment. Similar results were obtained in pre-intervention data in our study but marked improvement was observed after intervention session. [12,13,14]

A. Mohapatra, M.K. Gupta et al did an online snapshot of doctors about Bio Medical Waste management practices [15] Baru et al did a very useful study of Bio Medical Waste management in a tertiary hospital in West Bengal [16] According to them the knowledge of waste management was not upto the mark. Also in our study, knowledge regarding rules & regulations was very low but knowledge about fundamentals was good.

D. R. Mohan et al, N. Sumi studied and then analyzed the impact of training on BIO MEDICAL WASTE management. They evaluated the benefits after implementation of remedial measures for the same. [17,18] Our study exactly finds out the benefits in knowledge and awareness of doctors, nurses & technicians after training. P. Lakshabala studied incidence of needle stick injuries amongst housekeeping staff in Iran hospitals, Y. Shiferaw, T. Abebe also studied sharps injuries & exposures to blood and blood stained products in BIO MEDICAL WASTE handlers [19,20] They found that people with higher education of knowledge have better attitude towards BIO MEDICAL WASTE Management. The comparison of knowledge with attitude and practices of groups in our study shows that people with higher education had good knowledge but not necessarily same kind of attitude and practice habits. C. C. Ho, D. R. Mohan et al also concludes the need to develop a system of continuous education. We also recommend the need for adopting measures like interactive seminars, workshops & exhibitions at regular intervals creating awareness regarding hazards of improper biomedical waste disposal [17,21]

CONCLUSION-

Knowledge regarding biomedical waste management plays a key role in safe disposal of biomedical waste. Proper intervention through training programmes at regular time interval has global influence on safe biomedical waste management practices. Training programmes not only increase knowledge and awareness among health care professionals but also develops sense of responsibility which reflects in their attitude and practices.

The publicity of the subject by departmental programs and audio-

visual aids will definitely help to achieve standard Bio Medical Waste protocols and their strict compliance by all the involved health care personnel. Interventional education programs and orientation programs for new comers will help implementing rules and regulations regarding Bio Medical Waste in new generation

REFERENCES

1. The Gazette of India: Extraordinary, ministry of Environment and forest, notification, new Delhi, 20th July 1998, [http://delhi.govt.nic.in/detp/health/Bio Medical Wastecom.pdf](http://delhi.govt.nic.in/detp/health/Bio%20Medical%20Waste.com.pdf).
2. Gupta S, Boojh R, Mishra A, Chandra H. Rules and management of biomedical waste at Vivekananda Polyclinic: A case study. *Waste management*. 2009 Feb 28;29(2):812-9.
3. Pandit NB, Mehta HK, Kartha GP, Choudhary SK. Management of bio-medical waste: awareness and practices in a district of Gujarat. *Indian J Public Health*. 2005 Oct 1;49(4):245-7.
4. Qureshi Waseem MD, NA W, Nazir K. Awareness of Biomedical Waste Management amongst Staff of the Government SMHS Hospital, Srinagar A Tertiary Level Hospital in Kashmir Valley. *JK-Practitioner*. 2007 Jan;14(1):60-1.
5. Madhukumar S, Ramesh G. Study about awareness and practices about health care waste management among hospital staff in a medical college hospital, Bangalore. *Iranian Journal of Basic Medical Sciences*. 2012 Apr;3:7-11.
6. Sharma A, Sharma V, Sharma S, Singh P. Awareness of biomedical waste management among health care personnel in Jaipur, India. *Oral Health Dent Manag*. 2013 Mar;12(1):32-40.
7. Rao PH. Report: Hospital waste management—awareness and practices: a study of three states in India. *Waste Management & Research*. 2008 Jun 1;26(3):297-303.
8. Ananth AP, Prashanthini V, Visvanathan C. Healthcare waste management in Asia. *Waste Management*. 2010 Jan 31;30(1):154-61.
9. Askarian M, Vakil M, Kabir G. Results of a hospital waste survey in private hospitals in Fars province, Iran. *Waste management*. 2004 Dec 31;24(4):347-52.
10. Yong Z, Gang X, Guanxing W, Tao Z, Dawei J. Medical waste management in China: a case study of Nanjing. *Waste management*. 2009 Apr 30;29(4):1376-82.
11. Manyele SV, Anicetus H. Management of medical waste in Tanzania hospitals. *Tanzania Journal of Health Research*. 2006;8(3).
12. Patil GV, Pokhrel K. Biomedical solid waste management in an Indian hospital: a case study. *Waste management*. 2005 Dec 31;25(6):592-9.
13. Mathur V, Dwivedi S, Hassan MA, Misra RP. Knowledge, attitude, and practices about biomedical waste management among healthcare personnel: A cross-sectional study. *Indian Journal of Community Medicine*. 2011 Apr 1;36(2):143.
14. Saraf Y, Shinde M, Tiwari SC. Study of awareness status about hospital waste management among personnel and quantification. *Indian J Community Med*. 2006 Apr 1;31(2):111.
15. Mohapatra A, Gupta MK, Shivalli S, Mishra CP, Mohapatra SC. BIOMEDICAL WASTE MANAGEMENT PRACTICES OF DOCTORS: AN ONLINE SNAPSHOT. *National Journal of Community Medicine*. 2012 Apr 1;3(2).
16. Basu M, Das P, Pal R. Assessment of future physicians on biomedical waste management in a tertiary care hospital of West Bengal. *Journal of Natural Science, Biology and Medicine*. 2012 Jan 1;3(1):38.
17. Mohan DR, Prasad MV, Kumar KS. Impact of training on Bio Medical Waste management—A study and analysis. *EXCEL International Journal of Multidisciplinary Management Studies*. 2012;2(6):69-80.
18. Sumi N. 5 Study of Biomedical waste management practices in a private hospital and evaluation of the benefits after implementing remedial measures for the same. *Journal of Communicable Diseases*. 2010;42(1):39.
19. Lakshabala P, Azar FE, Kamali H. Needlestick and sharps injuries among housekeeping workers in hospitals of Shiraz, Iran. *BMC research notes*. 2012 Jun 7;5(1):276.
20. Shiferaw Y, Abebe T, Mihret A. Sharps injuries and exposure to blood and blood-stained body fluids involving medical waste handlers. *Waste Management & Research*. 2012 Dec 1;30(12):1299-305.
21. Ho CC, Liao CJ. The use of failure mode and effects analysis to construct an effective disposal and prevention mechanism for infectious hospital waste. *Waste Management*. 2011 Dec 31;31(12):2631-7.