

Health care waste disposal among private dentist in an Indian city: it's time to act

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Abstract

The provision of healthcare generates waste which can be detrimental to health and environment. Staff that provide dental healthcare ought to be aware of the proper handling and the system of management of dental waste used by different dental hospitals. A survey was conducted to determine the awareness of dental practitioners on hospital generation and handling of waste. A self-administered questionnaire was used.

Lack of awareness, ignorance of policy and procedure on the handling of dental healthcare waste and failure to attend educational activities were major defects found among practitioners in the study. There is a need for a plan to improve the awareness of dental healthcare workers about hospital generated waste and its proper handling.

Key words

Medical Waste disposal, dental waste; Practice management, dental and education

Introduction

Poor waste management practices pose a huge risk to the health of the public, patients and professionals and contribute to environmental degradation. Dental practices generate large amounts of waste such as cotton, plastic, latex, glass and other materials, most of which may be contaminated with body fluids.

Dental practices also produce small amount of other types of waste, such as mercury, silver amalgam and various chemical solvents.¹ US medical waste tracking system found that dentist generate only 3% of total medical waste.² Government of India, under its gazetted notification from the Ministry of Environment and Forests, informed all concerned that no one can

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dispose of any kind of waste, general or bio-medical waste in the open. Disposal of dental biomedical waste disposal in the public bins may harm the waste collectors if they are not appropriately protected.

An anonymous questionnaire survey was conducted among private dental practitioners in order to determine the knowledge, attitude and behaviour and the awareness about waste management policy and practices. Attitude related to the issue was also ascertained. Dentists were also interviewed regarding their disposal of different forms of dental waste.

Very few studies were conducted on waste management procedures in private dental practices in India and no such studies were done in central India.

Material and Methods

A questionnaire was designed to obtain information about the procedures used for disposal of waste in and from the dental practices. The practitioners were asked to indicate their views on waste management policy, practices and their attitude related to the issue. The questionnaire was pilot tested on a small group of dentists who were requested to complete it and to indicate if any question is unclear. The questions were grouped into three sets: knowledge based, attitude based and those regarding the behaviour of dentists in relation to dental health care waste management. Dental practitioners were asked for availability of Amalgam separators, Filters, Silver recovery, Recycle film, Equipment Maintenance Schedule (EMS), and facilities like Digital Radiography in their clinics. Each dentist was given a separate copy of the questionnaire. Confidentiality regarding identity of the participants was maintained by giving codes to the questionnaire sheet. All data management and analysis were carried out using Microsoft Excel.

Results

Disposal of dental waste was investigated at 105 randomly selected clinics in Indore city. Total of 98 private practitioners and 4 public clinics were included in the study. Three forms were rejected because of ambiguity. There were 62 males and 40 females, 26% of them completed post-graduation and rest were graduates in dentistry (table I).

Table I. Demographics

	N	
Gender	Male	62
	Female	40
Qualification	Graduate	76
	Post Graduate	26
Clinics	Private	98
	Public	4

Regarding the amount of dental health care waste generated, 91% reported the weight was up to 2 kilograms and 75% disposed of it every day, 18% disposed of the waste once in two days and remaining disposed of the waste after more than two days. Regarding the disposal of wastes, majority (42%) of them dumped the wastes in corporation bin, 37% of the respondents reported that authorised waste collection was done by biomedical waste management services. House to house waste collectors, collected the waste from 21% of the respondents.

Most of the practitioners (89%) depended on clinic assistants for waste management but these assistants have never undergone any formal training. Waste segregation of materials before disposal was carried out by only 34% of respondents and the majority (89%) reported that segregation was the responsibility of auxiliary staff. Only a very small percentage (11%) were of the view that doctors have a role in segregation. The majority segregated mercury before disposal but few of them did not separate. Sixty four percent of respondents reported that they did not colour code their waste. Bio-hazard symbol was reported to be used for labelling by only 15% of them. Only 17% of respondents reported that they maintain a register for waste disposal.

Sharps were dispose in a metal box by 56% of respondents, 23% disposed with other solid waste, 21% of dentists used puncture-resistant containers, before throwing them in the general garbage and 88% of them disposed without disinfecting them. Regarding liquid wastes, all the dental clinics were found discharging their waste water directly into the sewer system, especially developer and fixers used for development of dental X-ray film.

Nearly all (90%) reported that their oral health care setting does not have any annual education programme on waste management and 92% of them were interested in attending a programme on Bio-medical waste management. Majority of the assistant had never experienced any needle prick injuries in the previous year, although very few had experienced such injuries 1-5 times.

Safe management of dental health care waste was agreed to be an issue by 80% of the study participants and 57% of the respondents were of the view that it is the responsibility of the government. However there was almost total agreement (92%) that it is an issue that require team work. On the subject of waste management policy it is alarming to note that more than half (59%) of our sample were not aware of the legislation applicable to hospital waste management. 37% reported that they followed a waste management plan in their dental clinic settings.

Very few clinics had Amalgam separators (8%), Filters, Silver recovery, Recycle film (1%), Equipment Maintenance Schedule (EMS), and facilities like Digital Radiography were used by 18% clinics. The most common problem encountered in managing the dental health care waste was extra expenses, 68% of the respondents believed that safe management efforts will increase the financial burden and 26% of them felt that it is an extra burden on work, 14% believed that there is no availability of the service in their area of practice, whereas only 2% reported no problems in managing the dental health care waste. New practitioners stated that safe management of dental health care waste is an excessive financial burden for them (table II).

Discussion

Knowledge about biomedical waste management rules among the dental practitioners was acceptable, but they are dependent on clinical staff for the waste

Table II. Answers to questionnaire

		%
Waste generated per day	Up to 2 kg	91%
	>2 -<4kg	7%
	>4kg	2%
Frequency of waste disposal	Daily	75%
	In two days	18%
	More than 2 days	7%
Waste segregation before disposal	Yes	34%
	No	66%
Colour coding of wastes	Yes	36%
	No	64%
Usage of Bio-hazard symbol	Yes	15%
	No	85%
Waste disposed	Dumped in corporation bin	42%
	To garbage collector	21%
	Bio waste management agency	37%
Register maintenance for waste disposal	Yes	17%
	No	83%
Segregation was the responsibility	Auxiliary staff	89%
	Dentist himself	11%

Table II. Answers to questionnaire (continued)

Training of Person handling the waste		0
Interest in Annual education programme on waste management	Yes	92%
	No	8%
Problems faced in waste management	extra burden on work	26%
	Financial burden	68%
	No problem	2%
	Non availability of service	14%
Disposal of sharp waste	sharp waste in metal box	56%
	disposed with other solid waste	23%
	in closed plastic bottles	21%
Segregation of mercury /amalgam	Segregates	67%
	Does not segregate	33%
Disposal of liquid waste	directly into sewer	100%
	Collected in container	0
Awareness of the legislation applicable to hospital waste management	Aware	41%
	Not aware	59%
Availability in clinic	Amalgam separators	8%
	Silver recovery	4%
	Digital radiography	18%
	Recycle films	1%
	Equipment maintenance schedule	1%
Safe management of waste is an issue	Agreed	80%
	No response	20%
Safe management of waste is a responsibility of	Practitioners	43%
	Government	57%

management, but the knowledge was low among the assistant staff. This was similar to the findings from other studies.^{3,4,5,6} Low level of knowledge is mainly attributed to poor training facilities and also to relatively low educational level of the staff. Similar findings were found in other studies too.^{3,4}

A substantial percentage of practitioners dispose the waste without segregation. No prior disinfection of such infectious waste material is done, which leads to the exposure of such materials to garbage collectors. Majority of the dentist are segregating the mercury/amalgam. These results are in comparison to other studies conducted.^{7,8}

All the surveyed set-ups were found discharging their dangerous waste directly down the drains. Disposal of

excess mercury and liquid disinfectants is a burden to the environment. Very few of the clinics have Amalgam separators, Filters, Silver recovery, Recycle film, Equipment Maintenance Schedule (EMS), and facilities like Digital Radiography are in practice in few clinics. Concerning to sharp waste, few dentists used puncture-resistant containers, discarded needles directly in the garbage after being recapped and most of them placed the used needles and blades in closed plastic bottles before throwing in the general garbage. Blood-soaked dressings and amalgam waste were also thrown in the garbage. Contaminated sharp instruments must also be considered to constitute a special hazard.⁹ In the present study, the majority of respondents did not colour code their waste. Knowledge about colour coding of containers and waste segregation is an important pivotal point.

Participants were not aware of the legal issues involved. Safe management of dental health care waste has come to be recognized as being more of a problem of attitude rather than just providing technology or facilities. A notable factor in the attitude assessment was that an overwhelming percentage agreed that it is an issue that needs to be tackled and effective management is based on team work. The safe management of dental health care waste was reported as an extra burden to their work, which showed their poor attitude towards their practice. Safe management of dental health care waste was agreed to be an issue by the majority (80%). In India there is a legislation to ensure proper disposal of clinical waste but no prosecutions of dentist for illegal disposal of clinical waste make them to disregard it.

Conclusion

Safe and effective management of waste is not only a legal necessity but also a social responsibility, but a large proportion of the dentists are not practising proper methods of dental health care waste disposal. Lack of concern, motivation, awareness and cost factor are some of the problems faced in the proper hospital waste management. Proper surveys of waste management procedures in dental practices are needed. The existence of legislation governing dental healthcare waste disposal alone is not sufficient to motivate many practitioners to comply with guidelines. Rules in the form of Acts are also inadequate and lack of commitment to implement these Acts is common. Therefore, not only the private institutions, even the government oral health institutions are not interested in proper management and disposal of their wastes in accordance to the environmental rules.

Care is required when disposing of clinical waste, to protect and maintain the immediate environment from contamination, and to ensure the safety of those who come into contact with it. It is time that the curriculum for medical, paramedical and dental education give due importance to this vital issue. So also the academic institutions and non-governmental organisations could play a vital role in disseminating information. There is a need for education as to the hazards associated with improper waste.

Also, oral health care providers should always try to reduce the waste generation in day-to-day work in the clinic or at the hospital. Strict implementation of biomedical waste management rules is recommended. It should be made compulsory for oral healthcare facilities to get their oral healthcare personnel trained from accredited training centres. These training sessions should not become merely a one-time activity but should be a continuous process depending upon the patient input in different healthcare facilities, training of non technical and housekeeping staff should be specially emphasized.

References

1. Schaefer MF. Hazardous waste management. *Dent Clin North Am* 1991; **35**: 383-390.
2. Tan R, Noble MA. Sharps utilization and disposal in British Columbia physician's office. *Can J Public Health* 1998; **84**: 31-34.
3. Mathur V, Dwivedi S, Hassan MA, Misra RP. Knowledge, attitude, and practices about biomedical waste management among healthcare personnel: A cross-sectional study. *Indian J Community Med* 2011; **36**: 143-145. <http://dx.doi.org/10.4103/0970-0218.84135>
4. 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; **49**: 245-247.
5. Rao PH. Report: Hospital waste management—awareness and practices: A study of three states in India. *Waste Manage Res* 2008; **26**: 297-303. <http://dx.doi.org/10.1177/0734242X08088693>
6. Kishore J, Goel P, Sagar B, Joshi TK. Awareness about biomedical waste management and infection control among dentists of a teaching hospital in New Delhi, India. *Indian J Dent Res* 2000; **11**(4): 157-161.
7. Sudhakar V, Chandrashekhar J. Dental health care waste disposal among dental practices in Bangalore city, India. *Int Dent J* 2008; **5**: 51-54.
8. Ogden GR, Bahrami M, Shivarajasingam V. Dental student's knowledge and compliance in cross infection control procedures at UK dental hospital. *Oral Dis* 1997; **3**: 25-30. <http://dx.doi.org/10.1111/j.1601-0825.1997.tb00005.x>
9. Turnberg WL, Forest F. Survey of occupational exposure of waste industry worker to infectious waste in Washington State. *Am J Public Health* 1990; **80**: 1263-1264. <http://dx.doi.org/10.2105/AJPH.80.10.1262>