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Assessment of Biomedical waste management in Amravati (M.S)

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Abstract

Biomedical waste management is of great importance due to its infectious and hazardous nature that can cause undesirable effects on humans and the environment. The objective of this study was Assessment Biomedical Waste Management in Amravati City. A comprehensive Field visit, Interview and questionnaire survey method were implemented to collect information regarding different biomedical waste management aspects, including medical waste generation, segregation and collection, storage, training and education, transportation, disposal, and safety of cleaning personnel. Data was recorded by using an appropriately designed questionnaire containing 28 question regarding general information, handling, segregation, disposal and a health hazard of biomedical waste. Questionnaires were distributed amongst 40 randomly selected authorities of government and private hospitals in Amravati. Responses to the questionnaire were coded and entered into Excel Sheet. Later data was tabulated and analyzed by various statistical methods as per need and results were found out from the collected data. The study revealed that the system of biomedical waste management should be improved and there is lack of necessary knowledge and information regarding biomedical waste management system. During study it was observed that waste is not collected at regular interval. The Segregation of hospital waste plays the key role in the safe and efficient management of biomedical waste, especially infectious wastes from the noninfectious waste resulting in defining and limiting expenditures. Proper segregation of this waste at hospitals is recommended.

Keywords: Bio medical waste, health care waste, Clinical waste.

Introduction

In the present scenario the management of biomedical waste is becoming a major problem in most of the developing countries. Biomedical waste contains potential health and safety hazards. In addition to their infectious and toxic characteristics, the highly variable and inconsistent nature of biomedical waste streams has increased public concern about storage, treatment, transportation and ultimate disposal. Inadequate management of biomedical waste can be associated with risks to health care workers, patients, communities and their environment.

According to Biomedical Waste rules, 1998 of India, Biomedical waste means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in a research activities pertaining there to, or in the production or testing of biologicals, and including human anatomical waste, animal waste, microbiology and biotechnology waste, waste sharps, discarded medicines and drugs, soiled waste, solid waste, liquid waste, incineration ash, chemicals used in production

of biologicals, chemicals used in disinfection, as insecticides, etc.

Biomedical waste refers to all the waste generated by a health care establishment. It is estimated that 10-25% of biomedical waste is hazardous, with the potential for creating variety of health problems. Biomedical waste collection and proper disposal has become a significant concern for both the medical and the general community. Due to the implementation of the biomedical waste management rules every concerned health personal is expected to have proper knowledge, practice, and capacity to guide others for waste collection and management and proper handling techniques. There is an urgent need to improve upon the biomedical waste management practices in the country based on systematic and scientific planning of medical waste disposal.

Awareness regarding biomedical waste management is very less among health care personal. The health care workers play a very important role in biomedical waste management, hence they should

have thorough knowledge and practice to provide safety and safe environment including protection.

Aim and Objective of Study

Various aim and objectives of the present study was: 1. To study the biomedical waste management system in Amravati city 2.To study the various legislative aspects related to biomedical waste 3.To study the treatment and disposal methods of biomedical waste 4.To assess the quantity of Biomedical waste generated form Amravati city 5.To assess the awareness and knowledge of biomedical waste in the doctors of Amravati city 6.To propose solutions to solve the problems faced by the biomedical waste management system in Amravati City.

Methodology of Study

Amravati is a city in the state of Maharashtra, India and the seventh most populous metropolitan area in Maharashtra. Amravati is also the headquarters of the Amravati “Amravati Division” which is one of the six divisions of the state of Maharashtra (Amravati and Nagpur divisions together form Vidarbha region) Apart from Amravati district itself, following four districts also come under Amravati Division: 1. Akola, 2.Yavatmal, 3. Buldhana and 4. Washim. The city is having couple of government hospital and as many as 500 plus small to medium private hospital spread in the city. The city also has numerous homeopathic clinics. In order to accomplish this goal to present study the review of literatures were classified under following headings: 1.Literatures related to practice on biomedical waste management 2.Literatures related to knowledge and practice regarding biomedical

waste management 3.Literature related to quantity of biomedical waste generation 4.Literatures related to knowledge on biomedical waste management. A questionnaire was designed and used for data collection during the course of this project. Questionnaire contains 28 questions regarding general information, handling, segregation, disposal and a health hazard of biomedical waste was prepared. Questionnaires were distributed amongst the 40 randomly selected authorities of government and private hospitals in Amravati. Questionnaires were collected after completion and interaction regarding biomedical waste was carried out. Responses to the questionnaire were coded and entered into Excel Sheet. Later data was tabulated and analyzed by various statistical methods as per need. Site visits were carried out to the chosen hospitals and clinics to obtain the relevant information regarding the biomedical waste management system. With the site visits and interviews done in the selected hospital, ways of improving the biomedical waste management system can be proposed. To study the existing storage, collection, transportation, processing and disposal facilities a site visit to the common biomedical waste management facility at Amravati city was done which was run by “Global Eco Save System”. During the site visit information related to storage collection, transportation, processing and disposal was collected in addition to this the information related to working of plant, costing, details of hospitals, etc were collected. Analysis of the questionnaires was done to produce comments, figures and tables. Later data was tabulated and Microsoft Excel was utilized to build the graphs, pie charts,etc.

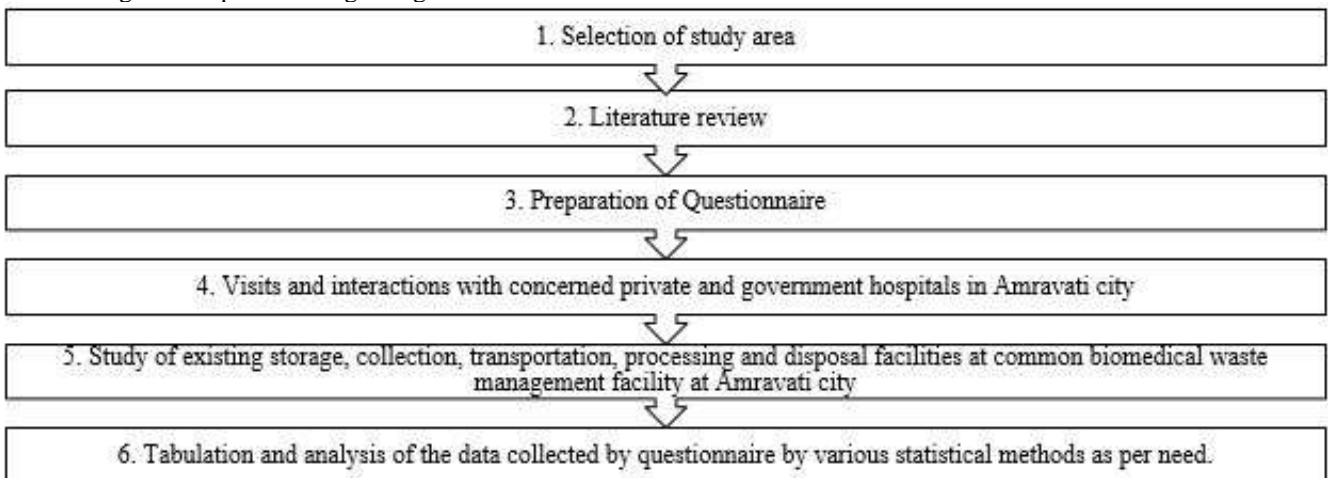


Fig 1: Methodology of Study

Existing System for Management of Biomedical Waste in Amravati

The waste from the hospitals are segregated in two colour of bags (red and yellow), yellow bags contain all the pathogenic waste whereas red bag contains plastic, sharps, cotton, etc. the collection, labeling and handling is done for all the bag through all the 5 districts. Plant contains two incineration chamber (Primary and secondary). The burner in incinerators takes 1 hr. to heat out completely. The LDO (Light Diesel oil) is used in incinerator. The quantity LDO required for 1 hour is 25 liters. The yellow bags are directly placed into primary incinerator for burning at 8500 C whereas the red bags are manual segregated.

Ash coming out of the primary incinerator are send to secondary incinerator were the ash is again burned at 10500 C. During incineration the chimney releases the harmful gases. Wetted packed towers are the simplest and most commonly used approaches to gas scrubbing. The principal of this type of scrubber is remove contaminants from the gas stream by pissing the stream through a packed

structure which provides a large wetted surface area to induce intimate contact bed and the scrubbing liquor. The contaminant is absorbed into or reacted with the scribing into or reacted with the scrubbing liquor. Wet scrubber are effective air pollution control devices for removing particulars and gases from industrial exhaust streams wet scrubbers are common in many industrial applications including pollutant reduction at petroleum refineries, chemical process acid, manufacturing plants, and steel making. The remaining ash is collected from the secondary chamber and disposed in the land and the waste water coming out of the wet scrubber is then send to the effluent treatment plant. The treated water from the effluent treatment plant is than recycled and reused.

The glass, plastic, needles form the red bag are manually segregated and disinfection is done with the help of Auto calving machine. After disinfection plastic material is send to shedding machine, glass material for recycling and sharps are send to sharp pits for deep burial.

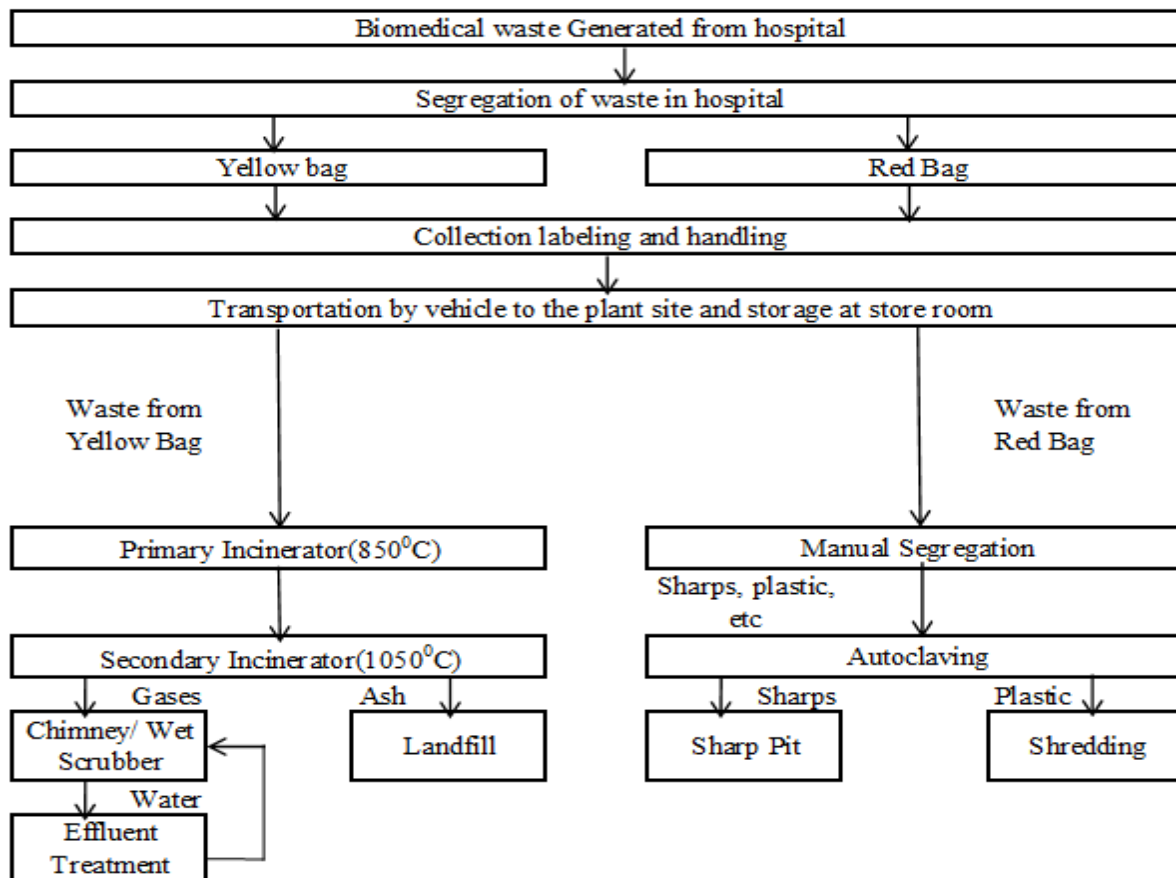


Fig 2: Flowchart for Biomedical Waste Management in Amravati

Biomedical Waste Generated per bed per day in the Hospital of Amravati city was found to be 0.5kg/bed/day in 24 (60%), 1kg/bed/day in 11(27.5%), 1.5 kg/bed/day in 1(2.5 %), 2 kg/bed/day in 3(7.5%), and 2.5kg/bed/day in 1(2.5%).

Results and Discussion

The findings of the present study showed that majority of Doctors in the study sample were Highly concerned (92%) about Biomedical waste. It was observed that 21(52.5%) of Hospital were having Waste Management Team. The Quantity of

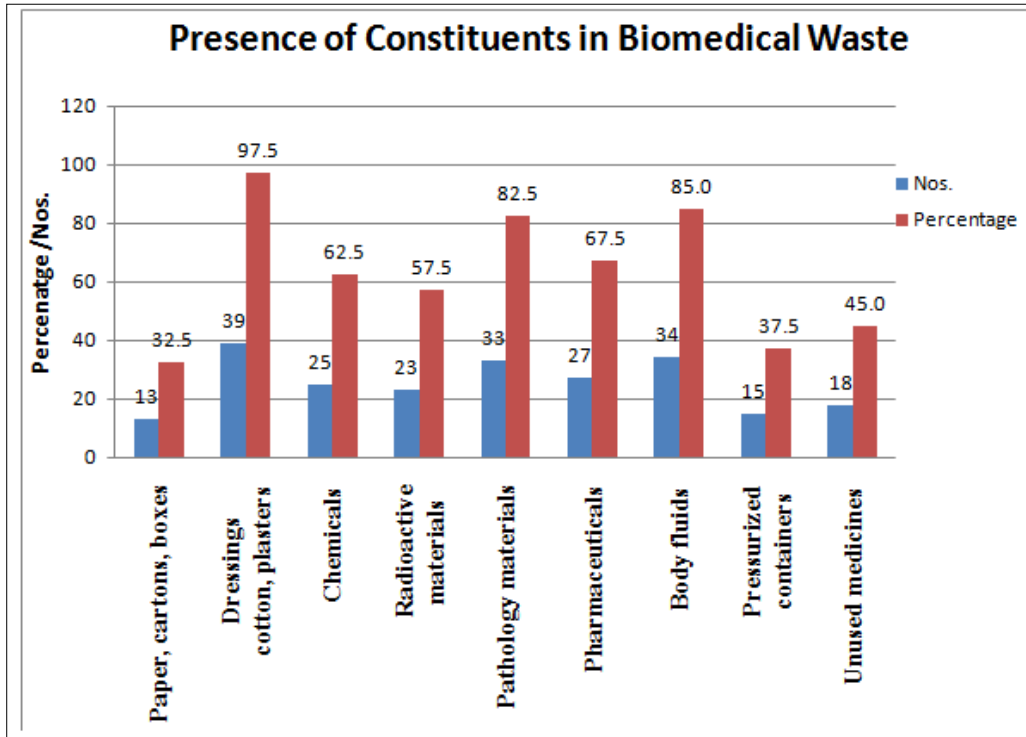


Fig 3: Presence of Constituents in Biomedical Waste

Fig. 3 represents that 13(32.5%) of the Doctors quoted that the waste coming out of their hospital also contains general waste such as paper, cartons, boxes, etc. whereas 39(97.5%) of doctors quoted that biomedical waste contains Dressings cotton and plasters. 25 (62.5%) responded that medical waste contains harmful chemicals and 23(57.5%) said that Radioactive materials may be the part of biomedical waste. 33(82.5%) replied that biomedical waste from their hospitals contains Pathological materials and 27(67.5%) said that it contains Pharmaceuticals. Most of the Doctors quoted that medical waste from their hospital contains body fluid, pressurized container and Unused medicines 34(85%), 15(37.5%) and 18(45%) respectively.

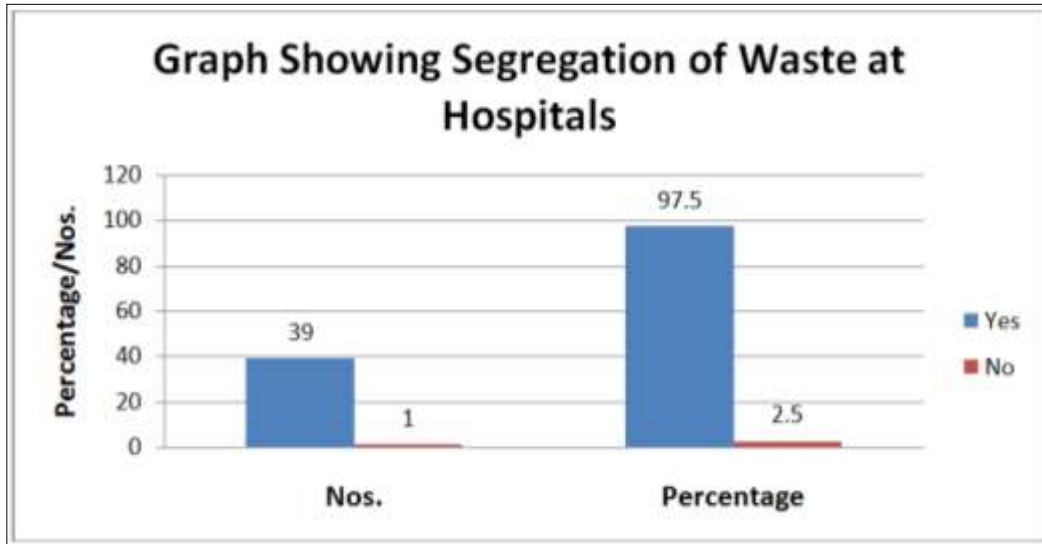


Fig 4: Graph showing segregation of waste at hospitals

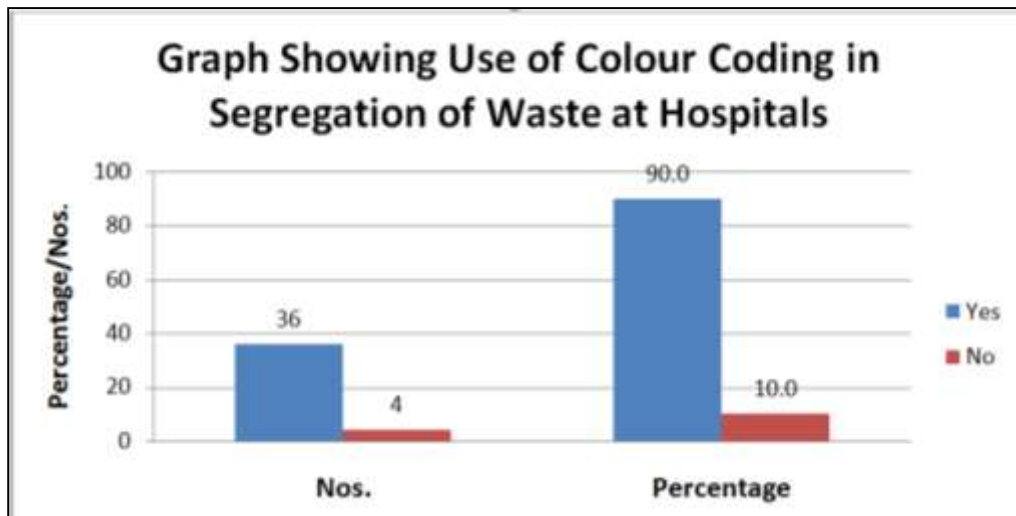


Fig 5: Graph showing use of colour coding in segregation of waste at hospitals

Fig 4. show the details of Segregation of Waste at Hospitals in which 39(97.5%) said that waste is segregated at hospital. Also Fig 5. show that Colour Coding is used in 36(90%) of hospitals for Segregation of Waste whereas 4(10%) quoted that they do not use colour coding for segregation of waste.

Conclusion and Recommendation

In the present study the assessment of biomedical waste management in Amravati city was done. The study revealed that the system of biomedical waste management should be improved and there is lack of necessary knowledge and information regarding biomedical waste management

system. During study it was observed that waste is not collected at regular interval and transported manually. The Segregation of hospital waste plays the key role in the safe and efficient management of biomedical waste, especially infectious wastes from the noninfectious waste resulting in defining and limiting expenditures. Proper segregation of this waste at hospitals is recommended. Improper disposal of infected and hazardous waste from hospitals, nursing homes and pathological laboratories lead to great risk of spread of diseases from highly contagious material and It also lead significant degradation of environment. Therefore it is important to aware staff about the hazards posed by Bio-medical waste, and its proper management to ensure that as far as possible the staff adheres to the

governmental guidelines related to Bio-Medical waste management.

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