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Biomedical Waste & Its Disposal in Ayurvedic Hospitals : Awareness and Practices

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ABSTRACT

Since beginning, the Ayurvedic hospitals are known for the treatment of sick persons but now it is a well established fact that hospital waste is a potential health hazard to the health care workers, public and ecosystem of the area. Biomedical waste disposal is an integral part of health care. The paper focuses on the identification and classification of biomedical wastes in Ayurvedic hospitals and current practices of its management in Ayurveda hospitals. Biomedical waste generated during *Panchkarma* procedures and making of Ayurvedic medicines in Rasashastra or in Ayurvedic hospitals includes discarded blood, sharps, body parts other human tissues, used bandages and dressings, discarded gloves, catheters, syringes and other medical supplies that may have been in contact with blood and body fluids, clotted blood, liquids like - oils, butter milk, plant decoction waste, waste milk, vomitus, fecal material, waste Kalka (Paste), dough, mud packs, fresh leaves, leaf extract, dead leech, Mansa Pinda (flesh), cloth, burnt ashes, heavy metals (Bhasma) like mercury, arsenic etc. BMW management is compulsory for Ayurvedic hospitals/ *Panchkarma* setups as commendable treatment approach and patient's reliability is increasing for emerging lifestyle disorders. Sixty percent of waste generated is biodegradable and environmentally accepted which can also be solved through deep burial method. Ten percent is recyclable. Only thirty percent requires management through other means. As per Ayurveda, on the basis upon its origin materials are obtained from *Jangama*, etc. Similarly, these are also the sources of waste substance. Likewise, Ayurvedic classics provide detailed knowledge of use of agro forestry waste, mining waste, and dairy industries wastes etc. to minimize the amount of waste sent to dumping grounds.

Key words: Biomedical waste *Panchkarma*, Rasashastra, *Jangama*, *Partiva*.

INTRODUCTION

Biomedical waste/hospital waste is any kind of waste containing infectious (or potentially infectious) materials.

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It may also include waste associated with the generation of biomedical waste that visually appears to be of medical or laboratory origin (e.g., packaging, unused bandages, infusion kits, etc.), as well research laboratory waste containing bio molecules or organisms that are mainly restricted from environmental release.^[1] As detailed below, discarded sharps are considered biomedical waste whether they are contaminated or not, due to the possibility of being contaminated with blood and their propensity to cause injury when not properly contained and disposed off.^[2]

According to Biomedical Waste (Management and Handling) Rules, 2016 of India, 'biomedical waste' is

defined as “Any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals or in health camps.”^[3]

Biomedical waste is a type of bio waste. Biomedical waste must be properly managed and disposed of to protect the environment, general public and workers, especially healthcare and sanitation workers who are at risk of exposure to biomedical waste as an occupational hazard. Steps in the management of biomedical waste include generation, accumulation, handling, storage, treatment, transport and disposal. This paper will put light on different type of biomedical waste generated in Ayurvedic hospital during different procedure and its management that should be environment friendly.

AIMS AND OBJECTIVES

1. To understand the bio-medical waste.
2. To know about the proper methodology of bio-medical waste disposal in Ayurveda
3. To know and understand the impact of biomedical waste on environmental health.
4. To probe into probable Ayurvedic measures for epidemiological hazards
5. Concept of biomedical waste
6. Biomedical waste in Ayurveda
7. To study the different method of biomedical waste in Ayurveda

MATERIALS AND METHODS

This study being literary review study was based on literary material available through various sources. An extensive data mining was carried out from various texts, peer reviewed journals, periodicals, websites of the concerned subjects etc. Finally, the document has been prepared by going through and utilizing the relevant portion of the reference material compiled under respective captions.

Importance of Biomedical Waste Management

Medical care is vital for our life and health, but the waste generated from medical activities represents a real problem of living nature and human world. Improper management of waste generated in health care facilities causes a direct health impact on the community, the health care workers and on the environment. Every day, relatively large amount of potentially infectious and hazardous waste are generated in the health care hospitals and facilities around the world.

Indiscriminate disposal of biomedical waste or hospital waste and exposure to such waste possess serious threat to environment and to human health that requires specific treatment and management prior to its final disposal. Unregulated biomedical waste management is a public health problem. This has posed a grave threat to not only human health and safety but also to the environment for the current and future generations. Safe and reliable methods for handling of biomedical waste are of paramount importance.^[4]

Effective Biomedical waste management is not only a legal necessity but also a social responsibility. Biomedical waste management should ideally be the subject of a national strategy with dedicated infrastructure, cradle-to-grave legislation, competent regulatory authority and trained personnel. Improving the management of biomedical waste begins with waste minimization. These standards, norms and rules on biomedical waste management in a country regulate the disposal of various categories of biomedical waste management to ensure the safety of the health-care workers, patients, public and environment.^[5]

Furthermore, developing models for the monitoring of hospital health-care waste practices and research into non-burn eco-friendly sustainable technologies, recycling and polyvinyl chloride-free devices will go in long way for safe carbon environment. Improving the management of biomedical waste begins with waste minimization.^[12] The novel waste which is generated

but not documented in rules should have a company buy back policy or should be treated as per recommended guidelines of Centres for Disease Control and Prevention or WHO.^[7]

Concept of Biomedical Waste in Ayurveda

The improper management of biomedical waste can be considered as a '*Janapadodwamsa*'. Acharya Charaka in his treatise - *Charaka Samhita*, mentions the etiological factors for *Janapadodwamsa* as inevitable and evitable. The inevitable causes include remote effects like the seasonal and environmental disturbances.^[7] Methane and carbon dioxide (CO₂) are greenhouse gases (GHG), whose presence in the atmosphere contribute to global warming and climate change. The evitable factors are those which can be prevented.

Air pollution, water pollution and soil pollution have a sudden impact in *Vayu* (air), *Udakam* (water) *Desam* (land) or impairment of ecosystem and health. It can be controlled by adopting suitable waste management techniques. One of the major problems addressed by Ayurvedic hospitals is the water mixed with oil, *Mudga Churna* (Besan powder) after the bathing of patients who underwent *Abhyanga* (oil massage) or any other therapeutic procedures may lead to clogging due to sedimentation. This water when reaches the drains will adversely affects the useful bacterial flora.

The *Kasayas* (decoctions) and liquids other than *Taila* (oils) used for *Dhara*, *Avagaha* (a type of fomentation technique like sitz bath), *Kshalana* are also disposed into drains. Most of these herbal preparations don't cause any issues unless and until they properly drained into sewage system. Otherwise, stagnant liquid wastes will emit foul odor and promote breeding of flies.

Health aspects

The need of biomedical wastes with regards to health aspects is mainly due to its capacity to produce injuries and infections. Injuries from sharps lead to infections to all categories of hospital personnel and

waste handler. Poor waste management and disinfection practices leads to nosocomial infections in patients. Suspended spores can also cause infection, for example, TB, tetanus, etc. The spread of *Aupasrgika Rogas* (communicable disease) mentioned in Ayurveda literature seems to be similar with that of nosocomial infections. *Yantras* and *Sastras* (surgical instruments) used in Ayurvedic hospitals should be properly disposed off. They should be properly disinfected, in case they are being reused. Risk associated with hazardous chemicals and drugs will affect persons handling wastes at all levels. Another important point related to health aspect is 'disposable' being repacked and sold by unscrupulous elements.^[9]

Management of Biomedical Waste generated during different Ayurvedic Procedures

There are different methods by which we can carry on the management of waste generated in Ayurveda So, there are different type of waste produced example in *Rasashastra* and *Bhaishajya Kalpana* during product of medicines: *Jangama*, *Parthiva*, *Odbhidha*. During different *Panchakarma* procedures different type of wastes are produce example tail, *Kashyam*, *Rakta*. Etc. So, let's overview briefly about different methods to manage biomedical waste in ayurveda.

- **Incineration:** Residues of decoction, bye product of *Churna*
- **Landfill:** Biomedical waste ashes after incineration
- **Proper Drainage:** Liquid waste like after *Vamana*, *Virechana*, *Rakatamooshan*, *Basti* etc.
- **Reuse of Taila (Oils):** used for *Dhara* or *Pizhichil* (type of fomentation technique) for the same person. This method is also not ideal because the medicated oil losses its potency and will be contaminated.

Some recent methods

The specific wastes from Ayurveda hospitals like *Kizhi* and oil are disposed in various eco-friendly and

productive methods. One of the interesting methods of management of used oil was found in an Ayurveda hospital at Thiruvanthapuram. The fresh oil waste after *Dhara* and *Pizhichil* is boiled along with *Kataka* seeds (*Strychnos potatorum*) till the foam subsides. It is then altered and again boiled with *Kataka* seeds and the supernatant clear oil is collected and used as fuel for lighting lamps. The used oil is given for preparing grease and coated in the base of vehicles after painting.

The wastes of various types *Kizhi* are disposed as

- *Njavara Kizhi* (Type of fomentation with *Njavara* rice) in biogas plant.
- *Naranga Kizhi* (Type of fomentation used with lemon) dried and used for fumigation as a mosquito repellent.
- *Ela kizhi* (Fomentation using various medicated leaves) and *Churna Pinda Sweda* (Fomentation using medicated powders) are either used for fumigation.^[5]

Bioremediation methods in waste management

Bioremediation is another area which needs to be focused on. It is a treatment that uses naturally occurring organisms to break down hazardous substances into less toxic or non-toxic substances. Significance of this method is that it uses no chemicals, as chemicals are very harmful to plant, animal and human life once they reach the water supply. Also, it can allow waste to be recycled. Some studies report that *Gomaya* (cow dung) as an excellent bioremediation method. Various biological organisms present in cow dung helps to destroy and reduce the amount of pollutants in the environment. Other bioremediation practices which can be rationally used are – ^[14]

- a) **Phytoremediation:** use of plants to remove contaminants from soil or water. This process can remove metals from water. It is very effective in remediating soil and organic compounds. Several studies show that planting trees like neem, which has air purification action and phytoremediation

action is an excellent idea to control pollution - migration or burned.

- b) **Bio-filtration:** effluents from the pharmaceutical industry often contain high concentrations of phenolic compounds. Bio filtration methods can be used for the removal of phenolic residues.
- c) **Bio-augmentation:** adding microbes and organisms to strengthen the same in waste to allow them to take over and decontaminate the areas.
- d) **Rhizofiltration:** the use of plants to remove metals in water.
- e) **Application of oil-eating microbes:** helps in the effective management of used oils, which are one of the important sources of waste in Ayurvedic hospitals.^[5]

DISCUSSION

Safe disposal of biomedical waste is now a legal requirement in India. India generates around three million tonnes of medical wastes every year and the amount is expected to grow at eight per cent annually.

Hence, the importance of training regarding biomedical waste management needs emphasis; lack of proper and complete knowledge about biomedical waste management impacts practices of appropriate waste disposal.^[15]

The impairment of ecosystem due to the impact of biomedical wastes on *Vayu* (air), *Udakam* (water) *Desam* (land) makes us to consider it as a '*Janapadodwamsam*'. So, the proper identification, segregation and disposal of biomedical waste is an ethical & social responsibility of health care professionals.

Strict implementation of biomedical waste management rules is the need of the hour. It should be made compulsory for healthcare facilities to get their healthcare personnel trained from accredited training centres & it should not become merely a one-time activity but should be a continuous process. The

application of proper waste management techniques and its identification in the curriculum helps to improve their understanding of good practice in Biomedical waste management. We also need a cost effective and environment friendly technology. A more coordinated effort from the pollution control authorities and better training of health care workers and administrators is required.

CONCLUSION

In ancient times, there were no such Bio-medical waste generated in the hospitals and the waste generated by Ayurvedic *Chikitsalaya* was biodegradable and most of it recyclable. Medical wastes should be classified according to their source, typology and risk factors associated with their handling, storage and ultimate disposal. The segregation of waste at source is the key step and reduction, reuse and recycling should be considered in proper perspectives. The challenge before us, therefore, is to scientifically manage growing quantities of biomedical waste that go beyond past practices. If the environment and health of community is to be protected then sensitization to this important issue has to be done, not only in the interest of health managers but also in the interest of community.^[16]

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