

MEDICAL WASTE AND ITS MANAGEMENT

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Abstract - A survey was conducted to study the source and management of medical waste in hospitals of Barama during 2015-16. Waste is any substance that is discarded after primary use or worthless, defective and of no use. Medical waste or hospital waste is any kind of waste materials containing infectious materials. It may also include waste material associated with the generation of biomedical waste that visually appears to be of medical or laboratory origin as well as research laboratory waste containing bio molecules or organisms which are mainly restricted from environmental release. Disposal of each waste nowadays create a serious problem in our society as they may potentially lead to the spread of different infectious disease. Therefore biomedical waste must be properly managed and disposed to protect the environment, general public and workers, especially healthcare and sanitation worker who are at risk of exposure.

Index Terms – Autoclave, Carcinogenic, Contamination, Cytotoxic, Disinfection, Genotoxic, Hazardous, Incineration, Infection, Mutagenic, Swabs.

I. INTRODUCTION:

According to WHO the waste generated during the diagnosis, testing, treatment, research or production of biological production for human or other animals is called medical waste. Generally medical waste is healthcare waste which may be contaminated by blood, body fluids or other potentially infectious materials. It may be solid or liquid. Example of infectious medical waste includes discarded blood, sharps, unwanted microbiological culture and stocks, identifiable body parts, other human tissues, used bandages and dressings, discarded gloves, different types of expired medicines, antibiotics etc.

Medical wastes may be broadly divided into the following categories-

- Sharps- This type of waste include anything that can pierce the skin including needles, scalpels, lancets, broken glass, razors, ampules, staples, wires and trocars.
- Infectious waste- Anything infectious falls in this category including swabs, tissues, excreta, equipment and lab cultures.
- Radioactive material- This type of waste includes unused radiotherapy liquid or lab research liquid.
- Pathological items- Human fluids, tissues, blood, body parts, bodily fluids and contaminated animal carcasses come under this category.
- Pharmaceuticals- It includes all unused, expired or contaminated vaccines and drugs. It also includes antibiotics, injectables and pills.
- Chemicals- This type of waste includes disinfectants, solvents used for laboratory purpose, batteries and heavy metals from medical equipment like Hg from broken thermometer.
- Genotoxic waste- It is highly hazardous form of medical waste which is carcinogenic, teratogenic or mutagenic. It includes cytotoxic drugs used in cancer treatment.
- General Non-Regulated medical waste- They are also termed as non-hazardous waste. They do not possess any particular chemical, biological, physical or radioactive danger.

This study was aimed to know the various sources of the medical wastes and its possible management.

II. METHODOLOGY:

The Field Survey Method was employed to obtain proper information regarding sources of medical wastes and their effects. Data collection was done by spot verification as well as by secondary information sources like books, papers, journals, NGO, internet etc.

III. RESULT AND DISCUSSION:

1. Sources of biomedical waste: Waste management is one of the major topics of importance to aware the hospital authorities and local bodies. The sources of biomedical waste can be categorized as primary and secondary sources according to the quantities produced. Approximately 75-90% of the biomedical waste is nonhazardous and as harmless as any other municipal waste (Ponka et al. 1996). The remaining 10-25% is hazardous and can be injurious. Apart from these the WHO classified medical waste into 8 categories such as General Waste, Pathological, Radioactive, Chemical, Infectious to potentially infectious waste, Sharps, Pharmaceuticals, Pressurized containers (Silva et al. 2004). But in India, Ministry of Environment and Forest, Government of India (1998) has notified Bio-medical Waste (Management & Handling) Rules -1998, which describes ten categories. Biomedical waste is produced in all conventional medical units where treatment of (human or animal) patients is provided, such as hospitals, clinics, dental offices, dialysis facilities, as well as analytical laboratories, blood banks, university laboratories (Mukesh, 2001). Health care waste refers to all materials, biological or non-biological, that is discarded in any health care facility and is not intended for any other use. Medical waste is the type of waste material containing infectious materials. It may be solids or liquids. Medical waste is generated from biological and medical sources and activities. Medical waste is normally generated during the diagnosis, testing, treatment, research or production of biological products for human.

2. Management of biomedical waste:

There are several methods that have been successful in the treatment of medical waste. The following are the methods that will show the treatment that may be available at hospital facilities viz. Autoclaving, Incineration, Thermal inactivation, Gas/Vapor Sterilization, Chemical Disinfection etc. Autoclaves have been used for nearly a century to sterilize medical instruments for reuse (Jang et al. 2006). Steam sterilization is most effective with low-density material such as plastics, metal pans, bottles, and flasks (Hegde, 2007). Infectious waste that contains noninfectious hazards should not be steam-sterilized (Chandra, 1999). The drawbacks to incineration include the large capital and operating costs for modern technologies. The advantage of incineration is no pretreatment is required and suitable for low heating volume. Thermal inactivation involves the treatment of waste with high temperatures to eliminate infectious agents. This method is usually used for large volumes (Patan et al. 2015). Chemical disinfection is the preferred treatment for liquid infectious wastes. Thus, there are several methods that can be applied to minimize the hazards resulting from medical wastes. Expired antibiotics, radioactive material, Genotoxic waste etc. can be considered as a threat to human civilization. Application of specific method will be more effective to minimize the hazards of medical waste. Control or medical waste management point of view we are still lagging behind. People must be aware about the danger of medical waste.

IV. CONCLUSIONS

Disposal of medical waste now-a-days create a serious problem in our society as they may potentially lead to the spread of infectious diseases. Daily exposure to the waste leads to accumulation of harmful substances in our body. That is why such waste must be properly managed and disposed to protect the environment, general public and workers, especially healthcare and sanitation workers who are at risk of exposure. Government, NGOs, leading institutions, educated people must play significant role in controlling the problem of medical waste. Common people must know about medical waste and its harmful impact on human society and how to control it; otherwise we would not be able to solve the serious problem of medical waste.

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V. REFERENCES

- [1] Adams, C.R., Zingler, D. K. and Lin, J. T. 1983. Mercury intoxication simulating any otrophic lateral Scelories. JAMA 250:642-643.
- [2] Adams, M. A., Bolger, P. M. and Caunderson, E. L. 1944. Dietary intake and hazards of arsenic.Pp 41-49 in Arsenic: Exposure and Health, W.R. Chappell, C.O. Abernathy and C.R Cothorn, ids Northwood, U.K: Science and Technology Letters.
- [3] Afonso, J.F. and de Alvarez, R. R. 1960. Effects of mercury on human gestation. Aon. J. Obstet. Crynecol. 80(1): 145-154.
- [4] AHA (American Hospital Association). 1993. An ounce of prevention: Waste Production Strategies for Health Care Facilities. American Society for HealthCare Environmental Services of American Hospital Association. Chicago: The Society.
- [5] Chandra, H. 1999. Environ News, 5(3).
- [6] Hassan, M. M., Ahmed, S. A., Rehman, K. A. and Biswas, T. K. 2008. Pattern of Medical Waste Management Existing Scenerio in Dhaka city, Bangladesh. BMC Public Health, Vol. 8, 2008, P.36, doi:10.1186/1471-2458-36
- [7] Hegde, V., Kulkarni, R. D. and Ajantha, G. S. 2007. J. Oral Maxillofac. Pathol, 11:5-9.
- [8] Jang, Y. C., C Lee, C., Yoon, O. S. and Kim, H. 2006. J. Environ. Manage, 80:107-115.
- [9] Mukesh, Y. 2001. JK-Practitioner, 8:276–202.
- [10] Patan, S. and Mathur, P. 2015. Assessment of biomedical waste management in government hospital of Ajmer city – A study.
- [11] Ponka, A. and Kaski A. 1996. J. Waste. Mange. Res. 14:145–150.
- [12] Silva, C. E., Hoppe, A. E., Ravello, M. M. and N Mello. 2004. Waste Management. 25:600-605.
- [13] Waste Made, Types of Medical Waste, 2010. <http://www.wastematerial.com/types.html>[citation time (5):1]
- [14] Madhya Pradesh Pollution Control Board, “Handling of Biomedical Waste,”2010. <http://www.mppcb.nic.in/Biocategories.html>
- [15] [https://www.researchgate.net/publication/258332243 Medical Waste Management and Control#references](https://www.researchgate.net/publication/258332243_Medical_Waste_Management_and_Control#references)
- [16] UAE Yellow Pages, "Clinics and Hospitals," 2010.<http://www.yellowpages.ae/category/clinics/>
<http://www.scribd.com/doc/4100881/>
- [17] Rutberg, G., Bratsev, N., Safronov, A., Surov, V. and Schegolev, V. 2002. The Technology and Execution of Plasma Chemical Disinfection of Hazardous Medical Waste, Plasma Science, IEEE Transactions, Vol. 30, No. 4, 2002, pp. 1445-1448.
- [18] Medical Waste Management Act (MWMA), El Dorado County, 2010. <http://www.edcgov.us/Government/EMD/Hazardous Materials/ Medical Waste Management Act.aspx>