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A study of medical waste pollution in Kanpur and adjacent areas

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ABSTRACT

The last 2-3 decades have witnessed the extension of health services across the world including India. Due to this, health services are easily available to almost everyone not only in urban areas but in rural regions as well. This has resulted to a new type of environmental hazard worldwide. This hazard has been named as biomedical waste. In fact, all types of waste generated during the diagnosis, treatment or immunization of human beings or animals is known as biomedical waste. Proper management of healthcare waste or medical waste is an important part of infection control and hygiene programmes in the field of healthcare. Healthcare centers play a crucial role in community acquired infection and produce large quantities of biomedical waste. The waste generation in healthcare centers or hospitals ranges between 500 grams to 3 kilograms per bed per day. This includes 7-10% plastic waste, 5-10% disposable syringes, 3-5% used glass material, bandages, linen and other infectious waste is up to 30-35%. Other general waste ranges from 40-45%. The present study deals with medical waste pollution in Kanpur and adjacent areas, and is an effort to provide some suggestions and solutions for reducing and controlling the production of biomedical waste.

Key words: Kanpur hospitals, Biomedical waste, health hazard, waste disposal etc.

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INTRODUCTION

The rapid rate of urbanization and industrialization has created various problems worldwide. Environmental pollution is one of them. According to well known environmentalist Odum, "Pollution is an undesirable change in the physical, chemical or biological characteristics of our air land and water that may or will harmfully affect human life or other species, our industrial processes, living conditions and cultural assets, or that may or will waste or deteriorate our raw material resources." Every part of environment is heavily polluted in present times. Since the last 2-3 decades, medical waste is also polluting the natural environment and causing a serious hazard for human health.

Every part of environment is heavily polluted in present times. Since the last 2-3 decades, medical waste is also polluting the natural environment and causing a serious hazard for human health. It is frequently seen not only in metropolitan cities but also in small cities and towns.

It is observed that medical waste contains a minimum of 50% biomedical waste which comprises of human anatomical waste, blood and body fluids, animal waste, microbiological waste, highly infectious waste and waste of experimental animals used in various types of researches. Discarded medicines, glass wares, disposables, solid cottons dress, linen, x-ray films and sharps such as needles, syringes are also among medical wastes. (Agnihotri and Mohan, 2005)

Biomedical waste should not be stored or collected at a place for more than three days. Biomedical waste has been found to be contaminated with many types of diseases carrying pathogens. Pathogens like Leptospira, a type of brain infection germinate at the places where medical waste gets

mixed with household garbage. Lethal chemicals such as dioxin and furans are produced as a result of improper treatment of medical wastes. Exposure to cadmium has been associated with problems like lung cancer and kidney damage. Exposure to other heavy metals like mercury, lead and chromium are also toxic for health and environment. The present study highlights the problem of medical waste pollution in Kanpur and adjacent areas. (Agnihotri and Mohan, 2005)

Once popular as Manchester of the East and 'City of Industries', Kanpur is now facing the hazardous pollution of biomedical waste. Government and private hospitals, nursing homes, clinics and pathologies, X-ray and surgical centres are mainly responsible for hazardous biomedical pollution. The present study includes 50 government and private hospitals and nursing homes where most of them have no system for proper treatment of medical waste. At least, 20 tons of biomedical waste is produced daily in Kanpur, of which only 4-5 tons is treated appropriately while the rest of it is dumped with household and municipal garbage or burnt at open spaces. Thus, the problem of biomedical pollution needs an urgent attention to get proper rid off at Kanpur and adjacent areas.

Sources of Medical Waste Pollution

According to an analog, a bed in hospital produces 0.5-1 Kg of medical waste per day. One of the main reasons for its creation is improper disposal of untreated medical waste from government as well as private hospitals, nursing homes, clinics, dispensaries, pathologies, surgical centers etc. Such indiscriminate disposal poses a great risk for human health and environment. (Babu *et al*., 2009)

It is observed that medical waste comprises of about 50% biomedical waste which includes of human anatomical waste, blood and body fluids, animal waste, microbiological waste, highly infectious waste and waste of experimental animals used in various types of researches. Discarded medicines, glass wares, disposables, solid cottons dress, linen, x-ray films and sharps such as needles, syringes, liquid waste and waste caused by slaughter houses are also considered as medical wastes. (Manzoor and Sharma, 2019)

Effects of Medical Waste Pollution

Medical waste pollution affects nearly all aspects of environment negatively. The soil is polluted due to dumping at open spaces. Hazardous gases like Furans, Dioxins and vapours of heavy metals causes air pollution due to burning of medical waste. Water resources also get polluted after coming in contact with hazardous medical waste.

The biomedical waste should not be stored at any place fore more than 3 days. It contains several disease carrying pathogens like hepatitis, cancer, tuberculosis, AIDS etc. Pathogens like Leptospira, a type of brain infection germinates at the places where medical waste mixes with household garbage. (Ul Haque, 2006)

Lethal chemicals like Dioxins and Furans are produced as a result of improper treatment of medical wastes. Exposure of cadmium is associated with lung cancer and kidney damage. Vapours of other heavy metals like Mercury, Lead and Chromium are also toxic for health and environment. Blood and body fluids, waste organs and body parts as a result of surgical procedures and operations also create lethal infections if not treated appropriately. (WHO, 2011)

Problems related to unauthorized medical centres

Like a number of other parts of the country, there are a large number of unregistered and non-licensed hospitals, medical centres and nursing homes are being run in Kanpur and adjacent areas. Because of corruption, lack of proper regulation and negligence at administration level, rules are never followed in such medical centres. Biomedical waste or other types of waste of such medical centres is either burnt in the open or dumped at garbage grounds. A large number of such medical centres established in Kanpur, Unnao, Fatehpur, Kannauj, Kanpur Dehat, Auraiya and other adjacent areas are producing and dumping huge heaps of medical waste all the year round.

Various medical centers of Kanpur collect their medical waste at a place and burn it in large quantities after collecting. Some of the medical centers and hospitals dump medical waste with household garbage which again creates the problem of medical pollution. According to a study, only 30-40% of the medical waste produced in Kanpur everyday is properly treated and the remaining 60-70% waste is either burnt in open or is not treated in appropriate ways. Thus, pollution created by biomedical waste is a huge problem today which needs an urgent attention so that the city can get rid off this environmental and health hazard.

CONCLUSION

Unscientific and improper management of biomedical waste is very harmful and risky for the people associated to medical profession and cleaning work as well as those residing in nearby areas as they stay directly in contact with the waste. Biomedical waste causes a lot of adverse effects on environment leading to a huge loss in the quality of air, water and soil. The quantities and proportions of different types of medical waste, their handling, treatment and disposal method have been inadequate throughout a number of studies. Harmful effects associated with poor management and shortcomings in the prevalent system have been identified by various researchers. The development of waste management plans, policies and protocols were recommended in various studies. However, establishing of treatment plants, running training programs of waste management for all healthcare workers was recommended.

Proper management of Bio-medical waste is a concern that has been recognized by both government agencies and Non government organizations. Several hazards and toxic materials containing medical waste should be disposed off with proper take and care. Inadequate and inefficient segregation and transportation system may cause severe problem to the society, hence implementing of protective measures and written policies is essential to reduce the risk of exposure to biomedical hazardous waste. In order to accelerate the rate at which proper processing and management methods are designed, timely regulatory and legislative policies and procedures are needed.

To properly separate, process and isolate the waste, effective characterization is very important, which is a challenging task. Safe and effective management of bio-medical waste is not only a legal necessity but also a social responsibility. Lack of concern in persons working in that area, less motivation, awareness and cost factor are some of the problems faced in proper hospital waste management. Proper surveys of waste management procedures in various practice is also very much needed. There is apparent need for education as to the hazards associated with improper waste disposal. An effective communication strategy is imperative keeping in view the low awareness level among the different category of staff in health care establishments regarding biomedical waste management. One important direction for future research would be to project the flows of bio-medical waste worldwide and quantitatively and qualitatively assess.

Several studies have been conducted regarding recycling of biomedical waste for producing energy and other useful products, but not sufficient work in this direction has been done at government level. By removing this flaw in our system, we can effectively reduce the health risk factor caused by biomedical waste and improve our environment.

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