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SHORT COMMUNICATION

Biomedical Waste Management: A Much-Needed Thrust Area for Environmental Protection in the Present Era

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Abstract

Biomedical waste (BMW) is the waste produced during the diagnosis, treatment, vaccination of humans or animals, as well as during research activities related to the development or testing of biological products. Inappropriate disposal of BMW is a potential threat not only to humans but also to the safety of environment. Waste management issues are creating day-to-day problems as they have profound effect on drastically changing global environment including air, water and soil pollution. There is a need to handle BMW by safe and reliable methods in order to prevent it as a public health problem. At the same time safe management of BMW is social and legal obligation of the people supporting and funding health-care activities. A much-needed thrust to environmental protection has been provided in the recent past that elucidates such standards to be followed by the common BMW treatment and disposal facility operators.

Keywords: Biomedical waste; Infectious waste; Public health problem**Introduction**

Biomedical Waste (BMW) in itself is a huge problem. As developing countries are transforming into developed ones, demand for healthcare facilities is rising day-by-day. Due to such economic advancements, production of BMW waste is also escalating at a rapid pace. BMW includes all the waste generated from the Health Care Facility which possess any detrimental effect on the human health or to the environment in general if not discarded properly (WHO, 2004). BMW is generated from hospitals, nursing homes, clinics, blood banks, laboratories and animal houses. Not all the waste generated by HCF (Health Care Facilities) may be infectious waste. Majority of waste generated in HCF may be non-infectious (75-85%) which can be disposed with usual domestic and urban waste management, and it is not considered BMW. The infectious hazardous wastes only contribute to about to 15-25% of the total generated medical waste. It should be kept in mind that non-infections and infectious waste should not be mixed but should be segregated at the place of their origin (Chartier et al., 2014).

Biomedical waste is dangerous as it possesses an implicit potential for spreading infections, both nosocomial within health care settings as well as to the individuals working outside health care facilities, like scavenging staff and to the general public. It has been reported that about 60% of all hospital staff sustain injuries from discarded surgical blades and needles during various procedures undertaken in health care facilities (Acharya and Singh, 2000). A disparity in perception and practice towards BMW management across the globe, even amidst the healthcare professionals, has cropped up as an important obstacle in patient safety and hospital management. Limited interest and priority, lack of formal training and surveillance by the hospital administration has further heaped on this challenge (Diaz et al., 2008).

The 3Rs, or reduce, recycle, and reuse, are the foundational principles of good BMW behaviour. The most effective methods of waste management (BMWWM) avoid creating trash altogether or try to recover as much waste as they can. Therefore, the numerous BMW disposal strategies, in order of financial viability, are: reduce, reuse, recycle, recover, treat, and finally dump.



Therefore, rather of using the "end of pipe technique," the waste should be handled at the source (WHO, 2004)". Protecting the health care staff against occupational health hazards emanating from hospital-waste management, demands for plausible infectious waste control measures. In addition to protecting workers health, such control measures protect public health and the environment from the hazards posed by hospital waste. Proper management ensures that infectious waste is handled in accordance with established and acceptable procedures from the time of generation through treatment of the waste and its ultimate disposal. In terms of better segregation, transportation, and disposal techniques, the new BMW-2016 regulations outperform earlier ones in order to reduce environmental pollution and guarantee the safety of the staff, patients, and general public. Additionally, the development of new, environmentally friendly BMW disposal techniques and the adoption of non-PVC medical equipment should be promoted.

In a World Health Organization (WHO) meeting at Geneva, in June 2007, key fundamentals for attaining safe and sustainable management of health-care waste were developed. It was stressed that through right investment of resources and complete commitment, the harmful effects of health-care waste to the people and environment can be reduced. All stakeholders associated with financing and supporting health-care activities are morally and legally obliged to ensure the safety of others and therefore should share in the cost of proper management of BMW (Chartier et al., 2014). Additionally, it is the manufacturer's duty to create medical equipment that are safe to dispose of in the environment. WHO strengthened that government should allocate a part of the annual budget for creation, support, and maintenance of efficacious health-care waste management system. These include brand-new, cutting-edge techniques for reducing the volume and toxicity of medical waste.

In recent years, the issue of managing biological waste has become increasingly important, especially in light of the ongoing COVID-19 dilemma. It has drastically changed the practice of BMW generation and management. Various forms of masks, gloves, face shields, full body suits, and splash-proof aprons, are available for use of Medical and para-medical staff as well as for general public. The unforeseen surge in magnitude of biomedical waste generation during the pandemic has raised an element of distress among biomedical waste handlers because the virus created an unpredictable work environment and enhanced the occupational risk of exposure. The possibility of health hazards has been escalated many folds during the pandemic due to the high virulence of the virus. The evaluation of BMW practise is fundamentally more important than ever to ascertain if public health institutions adhere to the norms and have the resilience to weather the continuing COVID-19 crisis (Capoor and Parida, 2021).

Conclusion

COVID-19 pandemic has posed many public health issues which need urgent attention and biomedical waste management is one of such issues. Unified and comprehensive guidelines for the general public must be devised and notified to manage the biomedical wastes by the local Governments. Biomedical waste management should be a shared teamwork supported by local governments, good practices followed by both health-care workers and HCFs, continuous supervision of BMW practices, and strong legislature. It is our fundamental right to live in clean and safe environment. The aim should be to make improvements and gradually heading towards a sustainable system so as to accomplish a healthier environment, mind and body. It is time that our service hospitals, which are eminently known for their high standards of hygiene, good maintenance and excellent administration, should take a lead in this vital area of health care.

In addition, intensive training programs should be focussed towards empowering the healthcare professionals about efficient biomedical waste management practices with broad scope and practical knowledge in all aspects. Training the staff with checklists and regular inspections can bring about accountability in the staff. Benefits of biomedical waste management include healthy surroundings, reduction in hospital acquired infections & cost of infection control, reduction in reuse of infectious disposables & prevention of occupational health hazards.

Awareness about hazards of biomedical waste & its proper disposal is required for a safe & healthy future. All health care professionals irrespective of their designation, experience and qualification, must participate in these interventions, so as to avoid cross infections among the professionals and patients. Above all, Non-Government Organizations (NGOs) should also undertake special programs and activities that contribute in this venture.

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