ASSESSMENT OF BIOMEDICAL WASTE MANAGEMENT IN INDIA DURING COVID-19

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ABSTRACT

Our nation includes a gigantic medical infrastructure. With the expansion, the number of clinics, and therapeutic and dental colleges opening, inappropriate transfer of biomedical waste is leading to critical environmental and health-related hazards. In this way, adequate information about this is often essential. This think about appears that there's a need for adequate knowledge among people understudies and people dealing with such biomedical squander and its administration or reusing of such materials. For this, immediate academic assessment to extend mindfulness is required amid preparing courses. In this way, little advances ought to be made in this viewpoint to procure great and huge benefits. The preferred methods and technologies have been discussed here to cope with the challenge of acquiring and handling BMW in the best manner via understanding the governmental and World Health Organization (WHO) guidelines on BMW. During Covid-19 the establishment of modern home isolate facilities, quarantine foundations, the chances of common squander getting sullied with biomedical squander has expanded exponentially. The situation amid COVID- 19 has brought this topic to the centre due to its nature and dangerous future possibilities that could destroy the environment in many ways. Subject matters related to the environment are often being ignored or taken casually which after a while causes greater damage to humans as well as planets like constant rise in temperature, ozone layer depletion, extinction of animals and etc, therefore, to ensure a better life for the coming generation ignoring environment will not serve the purpose and hence, actions are required to make a difference. Sanitization advances for taking care of COVID-19 waste from its isolated collection to different physical and chemical treatment steps have been looked into. Besides, approach briefs on the activities carried out by the Government of India, for COVID-19 waste administration counting the applications of distinctive cleansing strategies have also been discussed with a few potential illustrations successfully connected to decrease both health and environmental risks.

Medical care is crucial for our life's health and well-being. But the waste generated from medical activities can be dangerous, poisonous, and indeed deadly because of its tall potential for illnesses transmission. The dangerous and poisonous parts of waste from health care foundations comprising irresistible, bio-medical, and radio-active material, as well as sharps (hypodermic needles, knives, surgical tools, etc.), constitute a grave chance of polluting the environment if not appropriately treated or is permitted to get blended with other municipal waste. There are some irresistible biomedical wastes that incorporate used bandages, discarded gloves, sullied used needles, discarded blood, surgical tools, amputation, lancets, etc, and numerous other gadgets which are dependable for entering the skin. Disposal of such kind of waste is of natural concern as numerous of these biomedical wastes are classified as irresistible or biohazardous which leads to the spread of infectious illness. The health care industry is one of the driving businesses around the world, and in India, it is developing by leaps and bounds. Increased life hope, more prominent wellbeing mindfulness, and expanded priority of way of life illnesses have been key donors to this development. The Indian Health care segment incorporates corporate healing hospitals, private clinics, and therapeutic and dental colleges that create biomedical squander. This incorporates human and animal anatomical squander and treatment devices such as syringes and needles, as well as different materials utilized within the well-being segment within the handle of determination, treatment, and investigation. Biomedical squander is created in hospitals, nursing homes, blood banks, and obsessive research facilities amid conclusion, treatment, or immunization of different maladies. Hence, a strict disposal mechanism should be adopted to treat such biomedical waste in order to safeguard the environment and protect people from various diseases which can be caused by exposure to such a hazardous environment.

Biomedical waste (BMW) consists of liquid waste from any contaminated area, human anatomical waste, Sharp tools like needles and syringes, chemical wastes and incineration ash, human and animal waste, wastes from research laboratories, and veterinary hospitals, etc.

Biomedical products are now a part of human life and with this acceptance, the government should make stringent laws for people involved in the healthcare sector so that proper waste handling can be done in accordance with the law and in the best interest of the environment and future. Bio-medical waste implies “any solid and/or fluid waste counting its holder and middle product, which is created amid the conclusion, treatment or immunization of human beings or animals or research activities relating thereto or within the generation or testing of

natural or in health camps. Biomedical waste poses risk due to two principal reasons, the primary is infectivity and other toxicity. The best approach towards handling biomedical waste is to avoid the generation of waste or recover as much waste as possible, rather than dispose of it. The most important principle involved in the management of (BMW) is based on the notion of 3Rs, namely, Reduce, Reuse & Recycle.

According to Biomedical Waste Management Rules,2016 (Amendment in 2018&2019) the Central Pollution Control Board initiative towards amending BWMR, 2016 has proved that the government is concerned in the matter related to biomedical waste and other related topics but being concerned is not the solution the rules has been enforced throughout India but according to several sources only a few states and authorities are following the rules and changes for a greater good.

"Mishandling" is a part of management and management of waste requires a system and a code of conduct. So, it is easy and simple for the healthcare faculty to dispose of waste without harming nature and human beings. According to Biomedical Waste Management Rules, 2016 there are six steps involved in the process of disposal of biomedical waste from any healthcare institute.

The healthcare institutes must ensure that proper bins are located and every bin is been used according to the norms of Biomedical waste management rules, 2016 every institute must function color coordination and every bin and bag should carry biohazard symbols indicating the nature of waste to people and public to conduct proper collection of waste, this way the second stage that is segregation process becomes much easier for the people engaged in collecting and labeling biomedical waste. Segregation is the process of disposing of biomedical waste hence, this stage is often known as "Point of Generation" wherein the waste is generated at the point of source and not in later stages. Effective segregation alone can ensure effective waste management. According to BMWR, 2016 manual the bags and containers should not exceed ¾ capacity, and schedule 1 of BMWR, 2016 must be followed during the segregation process. The next step after segregation is the storage and transportation of waste, in this stage, the storage of BMW should not exceed 8-10 hours in any hospital and 24 hours in nursing homes. The BMW after all these stages has to be transported. Waste must be transported for disposal by a covered trolley or wheelbarrow. Manual loading should be avoided whenever possible. BMW bags/containers must be tied/closed prior to shipping. Before shipping a bag

containing a BMW vehicle, it must be accompanied by a document signed by the nurse/doctor mentioning the date, team, quantity, and destination.

Special facilities shall be used in such a way as to prevent direct access and contact with waste by carriers, collectors and the public. Shipping containers must be properly packed. The effects of traffic accidents or major accidents must be taken into account in the design and the driver must be trained in the procedures he must follow in the event of an accidental fall. The inside of the container should also be thoroughly washed. Also, the waste can be transported by road or by railways, and by ensuring compliance to relevant provisions under Motor Vehicles Act and Indian Railways Act. And if the waste if transported via air then the authorised person must follow the WHO guidelines in such a case.

After the transportation of BMW, the treatment procedure is followed up. The treatment process consists of five kinds of technologies which are Thermal process, Chemical process, biological process, Irradiation process and Mechanical process. Herein, thermal process includes following other techniques like autoclaving, microwaving, hydroclaving, etc., in which heat is used according to the product, it further inculcates low heat system and high heat system. In the chemical process harsh chemicals are used on waste to disinfect. In the biological process enzymes are used for treatment of waste. In Irradiation process waste are exposed to ultraviolet radiation in a chamber. And in mechanical process the physical form of waste is changed by following shredding and compaction method. Other processes like autoclaving, deep burial, Incineration, Microwaving are used to treat waste, the authorities must adhere and strictly comply to schedule II of Bio medical waste management rules, 2016 in following these procedures.

According to an article from Times of India, India has produced 56,898 tonnes of Covid-19 biomedical waste between June 2020 and June 2021 this is because the virus is infectious and highly dangerous. On 26th June 2020 the Ministry of Health and Family Welfare launched Biomedical Waste Tracking App which was a great effort in tracking down COVID- 19 biomedical waste and taking up biomedical waste management matters on an urgent basis. The Central Pollution Control Board (CPCB) told the National Green Tribunal that over 1.60 lakh healthcare facilities (HCF) over the nation have not gotten essential authorization beneath Bio-medical Squander Administration (BMWM) Rules and are running without authorization.Thus, mishandling and untreated waste has been disposed off in an untraceable and wrongful manner due to which it is causing grave problems

like accumulation of toxic substances in the food chain through the plants and animals that feed on it, increase in rate of contamination of water which can further lead to various health diseases, obstruction of drains and loss of biodiversity, etc.

Novel Coronavirus disease (COVID-19) is an irresistible disease caused by the SARS-CoV-2 virus. India reported its first case in Kerela when a lady flew from China to India, and unknowingly carried the virus which resulted in the spread of virus in India, it was all those passengers who travelled from China because at that time the virus was on peak.

Most individuals who drop wiped out with COVID-19 involved mild direct side effects and recuperate without uncommon treatment. Be that as it may, a few will end up genuinely sick and require medical attention. The infection spread widely from an infected person's mouth or nose in little fluid particles when they cough, wheeze, talk, sing or breathe. These particles run from bigger respiratory droplets to littler aerosols. One could be contaminated by breathing within the infection in case you're close to someone who has COVID-19, or by touching a sullied surface and after that your eyes, nose, or mouth. The infection spreads more effortlessly inside and in swarmed settings. Coronavirus was not a single virus that led problems all around the world, it carried mutations and various variants throughout year 2020 till today which not only collapsed Health system of India but harmed environment simultaneously as many people infected were home quarantine and hence, the use of medicinal equipment's like swabs, gloves, masks, injections, etc., were used by common people who had zero knowledge about the proper disposal of such biomedical waste which ultimately led in increase of degradation of environment. Also, death rates increased in number and there was a time when cremation were done without pyre which contaminated soil and partial burnt bodies were thrown in the rivers without any prior treatment which led to water contamination. Situation amid COVID-19, was difficult for the nation as it focused to save lives which was need of the hour at that time, but the future shrinks with this thought that, "A future without nature and healthy environment is no future at all."

There is a famous saying that, "It's never too late to mend" which means, one is never too old to alter one's ways, learning is continuously conceivable. And therefore, we must now take measures to overcome the future consequences. And the environment problems cannot be resolved alone, the action must be collective and effective it must not entirely be left on the government to bring a change as change comes when it comes from within. The first step to introduce change is from education from school's curriculum to a mandatory contribution from

organizations, pharmaceutical companies, start-ups, multinational companies, etc., just like tax, something has to be done to spread awareness and passion among people to participate in eco-friendly activities without expecting anything in return. Hospitals must train their human force about disposal activities with consequences of such bio waste, treatment plants must be set up on the outskirts of the city. Currently, vaccination is on the peak which is the only cure to the virus as of today, billion tonnes of syringes and injections are being used and treatment of such waste can help create cycle of reuse, reduced and recycle which will help save resources and environment at the same time. Bio- medical waste is mostly made of plastics, carbon or stainless steel, glass for containers and rubber for gloves and other materials are used which can be treated by certain methods instructed by Ministry of Environment and Forest, Government of India under the Bio-Medical Waste Management Rules, 2016 in India also World Health Organisation (WHO) as issue an entire guide regarding handling of bio-medical waste and its treatment.

In the conclusion, India is a developing country and every facility with respect to treatment and handling of bio-medical waste is still not well-equipped from training of carriers to occupier, from educating people about proper disposal, from awareness about consequences of mishandling, from placing coloured bins in hospitals and other medical institutes holding any such activities involved with Biomedical waste every other occupation caring biomedical waste handling is not treating waste according to the norms which is causing major biomedical waste management crisis which is a serious threat to environment. Even if few are disposing the waste following procedures prescribed are either doing it correctly or they are partially caring out activity for the sake of doing it and not considering it their important duty and underdoing it. Hence, it is important to understand the logic behind the concern before educating people or spreading awareness among people the need to proper handling or disposal or such waste. One must act aptly on this notion, to not only protect environment but themselves from any kind of disease or virus which might cause a disaster just like COVID-19 which is yet not over!