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A Study on Health Care Waste Management in Some Selected Hospitals of Dhaka City

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ABSTRACT

This study reviews the current situation of health care waste management (HCWM) and practices in Dhaka. The aim of the study is to investigate the present condition of hazardous waste generation, sources, types, in-house management, treatment facilities and final disposal pattern. The analysis has also assessed the application of different technological methods for the improvement of present situation with a view to evolve an efficient and improved medical waste management in Dhaka city. The methodology for this study includes empirical field observation and field level data collection through inventory, questionnaire survey, interviews and focus group discussion. The relevant secondary data for this project have been mainly collected from the published and unpublished sources. The study reveals that 80.77% of total HCW are non-infectious and the rest 19.23% are infectious wastes. The average waste generation rate for the surveyed health care establishments is 2.63 kg/bed/day. In some hospitals and health care establishments', the waste disposal practice has been found to be quite unsafe, and both clinical and non-clinical wastes have been found to be thrown together. A variety of methods have been observed in the study areas for disposal of the wastes including burning, burial, selling, dumping, and removal by municipal bins. The knowledge level of hospital staffs on the harmful impacts of improper waste disposal is not satisfactory in all cases. Some cleaners are found mishandling the generated wastes. They segregated the used sharps instruments (mainly the syringe-needles), saline bags, blood bags and test tubes and non-hazardous wastes for sale (resale) or reuse. There is an urgent need for raising awareness and education on medical waste issues. Proper waste management strategy considering all the stakeholders is recommended to ensure a pollution free Dhaka city.

Keywords: Waste management, health effect, Collection, Separation, Segregation

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INTRODUCTION

Health care centre is a complex, multidisciplinary system which consumes thousands of items for delivery of medical care. These healthcare products leave some unusable leftovers which are termed as hospital wastes. Medical waste is defined as any solid or liquid waste that is generated in the

diagnosis, treatment or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biological (BAN and HCWH, 1999). After the liberation war, a rapid growth of health care facilities has been occurred in Dhaka city both in the public and private sectors, dictated by the needs of expanding population. With the increase of health care facilities, health care waste management (HCWM) is a burning issue for Dhaka city. Health care waste (HCW) contains infectious, pathological, sharps, pharmaceuticals, hazardous, genotoxic, chemicals, and heavy metals, radioactive and other general wastes. HCW is capable of causing diseases and illnesses to people, either through direct contact or indirectly by contaminating soil, groundwater, surface water and air. The improper disposal of HCW in Dhaka city poses a high health risk to humans as well as the environment. The improvement of waste management in clinics and hospitals is essential to minimize the spread of infectious diseases.

Nowadays, the attitudes of the operators of health care facilities in Dhaka city have been changed to incorporate proper HCWM practices in their daily operations. Awareness has been created among the stakeholders that HCWM are essential to improve hospital management practices.

This study reviews the current situation of HCWM and practices in Dhaka city. The aim of the study is to investigate the present condition of hazardous waste generation, sources, types, in-house management (e.g. storage, collection, transportation and disposal) in the selected hospitals. The analysis has also assessed the application of different technological methods for the improvement of present situation with a view to evolve an efficient and improved medical waste management.

MATERIAL AND METHOD

The study is intended to focus on the mismanagement and possible threats of health care waste management in some selected establishments of Dhaka city. According to Directorate General of Health Services (DGHS), Government of Republic of Bangladesh, there are 840 registered healthcare establishments in Dhaka North and South City Corporation areas among which 21 Government Hospitals, 643private hospitals & clinics and 1109 Diagnostic centers (DGHS, 2013). For this study purpose a well-known private clinic named Holy Cross Red Crescent Hospital (Ward 35, Dhaka North City Corporation) and a government hospital named Mitford Hospital (ward 66, Dhaka South City Corporation) are chosen. No statistically rigorous sampling procedure could be followed for this study. This is an exploratory research based on qualitative and quantitative approach. Both primary and secondary data have been collected for the study. The primary data have been collected on the basis of questionnaire through formal interview of the manger, matrons, cleaners, ward masters and patients of the hospital. The secondary data have been collected from the published sources like books, journals, research reports etc. Data collected cover a wide range of information relating to the different aspects of hospital waste management system as well as the expectation of the common people regarding the well management of health care waste to ensure their rights to have a pollution free environment. The field survey has been conducted for a period starting from May 20, 2012 and ending at June 07, 2012.

STUDY SITES

Mitford Hospital established in 1820, named after Sir Robert Mitford, Collector of Dhaka and also a long serving judge of the Provincial Court of Appeal. During this time Medical facilities were inadequate. Before his death in England in 1836, he bequeathed the bulk of his property (about Rs 800,000) to the government of Bengal for benevolent works in Dhaka including building of a hospital. From the inception, the hospital was under the administration of a board accountable to Dhaka Municipal Corporation. A European ward was established in the hospital in 1887, and in

1889-90 Raja Srinath Roy of Bhagwakul set up an eye ward at a cost of Rs 3, 00,000 in memory of his mother. It got the recognition of a first grade hospital in 1917. It has 850 beds in different wards, outdoor patient capacity is 1930 and inpatients capacity is 1030. Holy Family Red Crescent Medical College Hospital was established in 1953 in Dhaka near the Ramna Thana. It has the capacity for 650 beds patients. The hospital provides average 375 indoor patients and outdoor advice to about 310 patients in a day. Table 1 shows the capacity of surveyed hospitals. Figure 1 shows a location map of surveyed hospitals.

Figure -1: Location of Surveyed Hospitals from Dhaka city Map

RESULTS AND DISCUSSIONS

The rate of waste generation differs due to geographical location, season of the year, collection frequency, availability of different treatment facilities, social status of the patient (i.e. income, living standard, awareness about diseases), hospital management, legislation etc. In middle and low-income countries, health-care waste generation is usually lower than that in high-income countries. Figure 2 and 3 show amount of waste generation in kg during the survey period of Mitford Hospital and Holy Family Red Crescent Hospital respectively. The amount of waste generated in hospitals depends upon various factors such as the number of beds, types of health services provided, economic, social and cultural status of the patients and the general condition of the area where the hospital is situated. In Mitford Hospital there is a bowl with capacity of 2-3 kg kept below the bed of various wards for collecting general waste. During the field survey, it is observed that Hospital cleaners use color containers for collecting different wastes e.g. black, green, yellow and red for general, plastic, sharp and infectious wastes respectively. The surveyed hospitals generate pathological wastes, textile stained with blood, used syringes, broken bottles and glass, paper, cans and other metals, It is also observed that surgical wastes like bandage, syringes, soiled cotton and pathological waste like body fluid, tissue, saline bags are also disposed in same manner and find their way in the DSCC bins. Percentage Distributions of different collected wastes in Mitford Hospital is shown in Figure 4.

In Holy family Red Crescent Medical College Hospital there is a bowl with capacity of 2-2.5 kg kept below the bed of various wards for collecting general waste. This general waste includes plastic, packaging, paper, food, vomit etc. Even the pharmaceutical wastes including both liquids and tablets are disposed off in the bowl making the total waste hazardous for normal disposal.

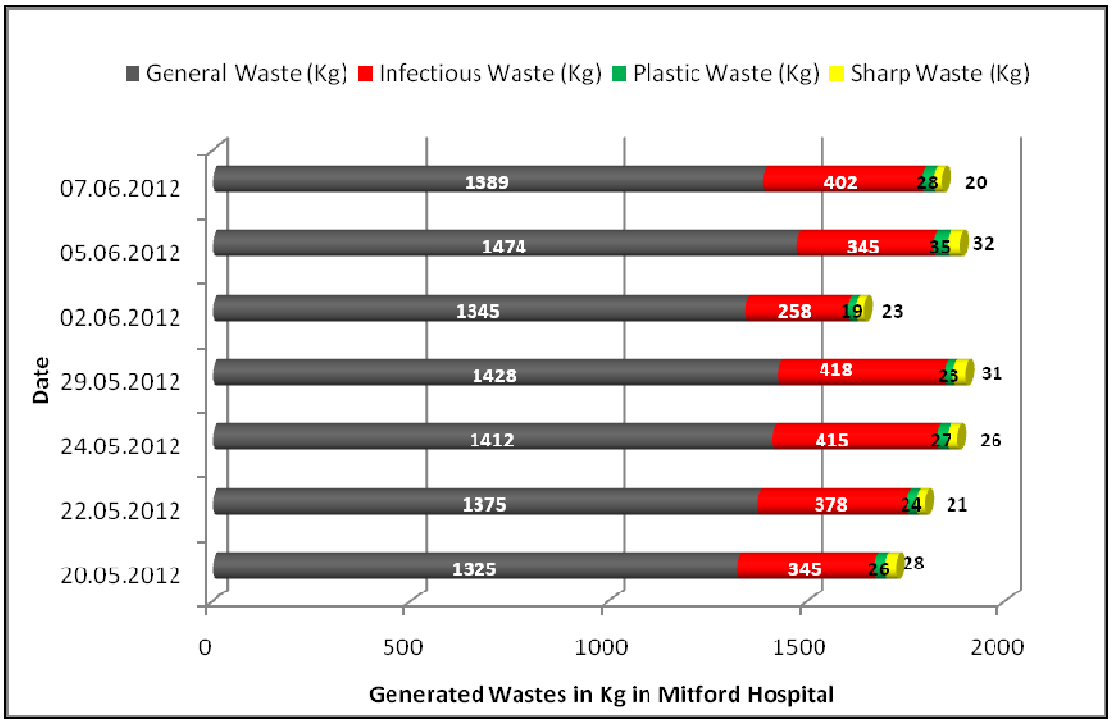

Figure 2: Waste Generation in Mitford Hospital during Survey Period

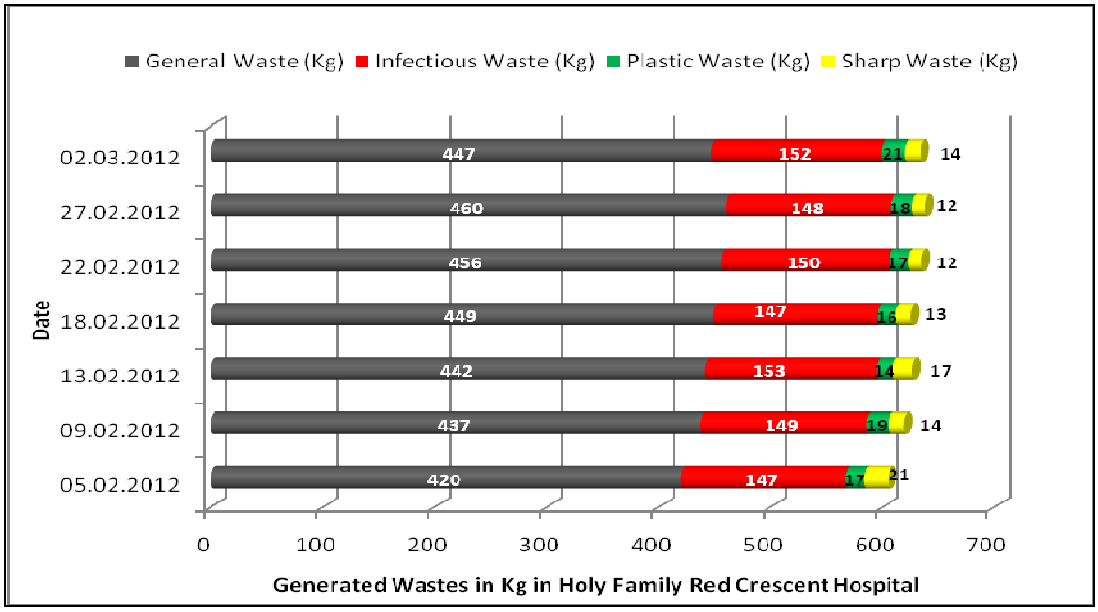

Figure 3: Waste Generation in Holy Family Red Crescent Hospital during Survey Period

These wastes are then collected by cleaners and transported to the internal dustbin for temporal storage. Waste is thus collected twice a day. Waste collected from different wards, cabins, departments and operation theaters are stored in a temporal storage bin located in the hospital premises for a whole day until they are finally disposed of to the nearest bins provided by Dhaka

North City Corporation (DNCC) outside the hospital boundary. Percentage Distributions of different collected wastes in Holy Family Red crescent Hospital is shown in Figure 5.

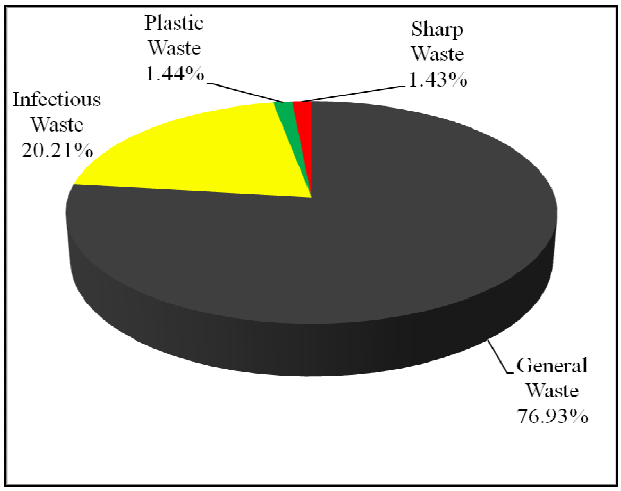

Figure 4: Distribution of Different types of Medical Wastes in Mitford Hospital

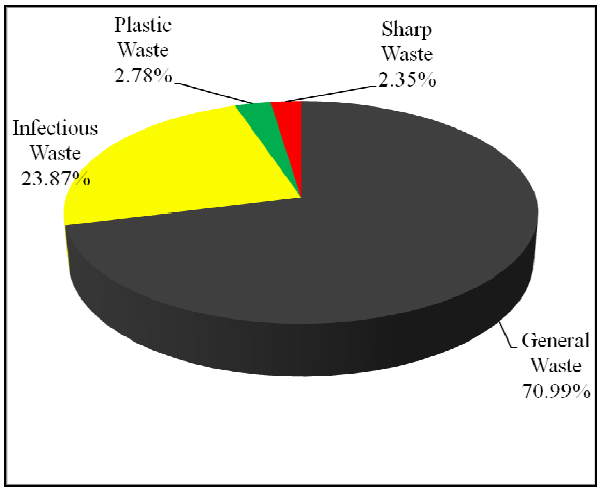

Figure 5: Distribution of Different types of Medical Wastes in Holy Family Red Crescent Hospital

The waste generation varies in different departments. Waste generation is highest in the Gynecology department/wards of both hospitals whereas it is the lowest in Urology departments/wards of both hospitals as well. In Mitford hospital, the medicine, surgery, pediatric and trauma care departments are producing nearly same amount (second highest) of wastes per bed per day. But in Holy family Red Crescent Medical College Hospital Surgery department contributes the second highest portion which is more than medicine and other departments. The general, infectious, plastic and sharp wastes are found to be highest generated in both hospitals from Gynecology ward/department. The waste generation rate in different departments/wards of Mitford and Holy Family Red Crescent Hospital is shown in Figures 6 and 7 respectively.

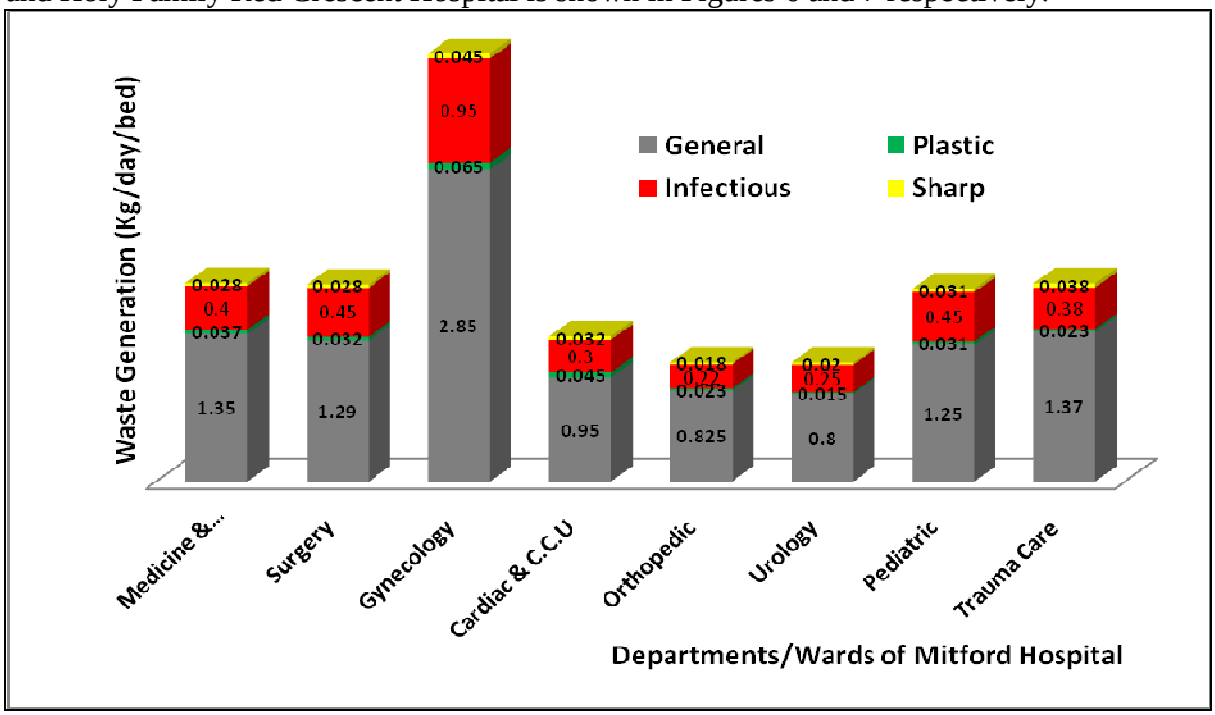

Figure 6: Waste Generation Rate in Different Departments/Wards of Mitford Hospital

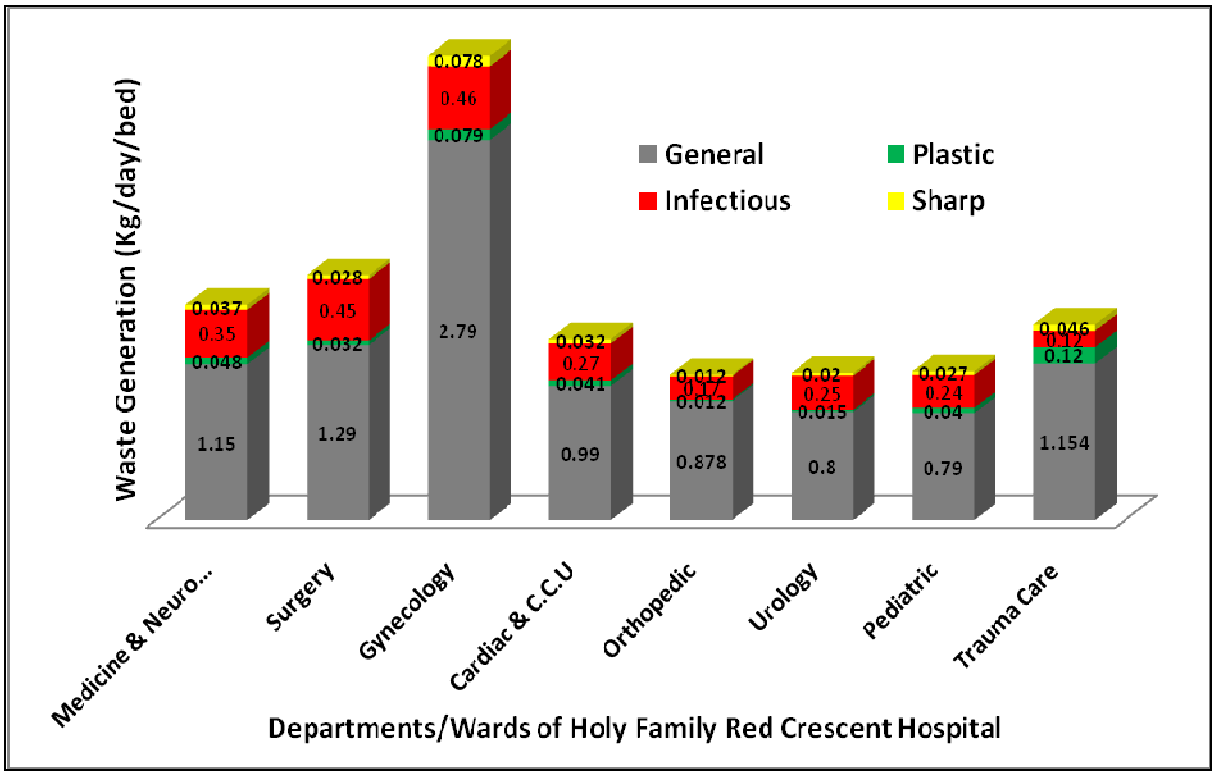

Figure 7: Waste Generation Rate in Different Departments/Wards of Mitford Hospitalof Holy Family Red crescent Hospital

The waste collector vehicles of city corporations collect health care wastes from hospitals and then transfer it to the landfill site. Syringes, needles and saline bags are claimed to be separated for the interchange with the new products from the suppliers by the ward masters and cleaner. But the real scenario is quite different. Some swindle cleaners with the help of nurses and ward masters manage to mishandle the bags and syringes for further selling to the dishonest recycling vendors who are then responsible to supply the improperly treated syringes and bags to the market. Some cleaners are involved in separating plastic and glass bottles, drinking and pharmaceuticals containers for selling to the recyclers after throwing off into the internal bin. It is noted here that infectious wastes should be packaged for protecting waste handlers and public from possible injury and disease that could result from exposure to the waste and avoiding attraction to rodents and vermin (Patil and Pokhrel, 2004). The integrity of packaging can be preserved during handling, storage, transportation and treatment. Sharp instruments are generally stored in separate refuse receptacles. Wastes are then transported by the hospital authorities to the nearest corporation bins outside the boundary. Separated sharps and infectious wastes when are stored in substantial amount (usually after 15 or 30 days) are carried to a place near the Buriganga river at a distance less than 1 km away from the hospital and locality. These wastes are burnt there openly on the sloping side of the embankment of the river and thus polluting the river. The hazardous wastes from two selected hospitals are collected once a day, preferably in the morning. The collection is done with a two crew pickup van of city corporations with the help of PRISM Bangladesh, a non- government non-profit voluntary organization, established in 1989. The collection starts with collecting waste from Mitford Hospital. The collection route has been set in such a way that the last collection point (Holy Family Hospital) to the treatment and disposal site (Matuail). Wastes of the 3 different containers has been measured before loading into the van for the business purposes so that respective values of different types of hazardous wastes can be found and charged money to the hospital authority. The wastes from the 3

different types of containers again also segregated for the final assurance that they are not mixed up. The needle from the syringe and saline bags are separated, after the needles are separated they are treated as sharp wastes. Other metallic sharps and needles are then buried into a concrete tank through a funnel shape inlet. There is a treatment plant for the treatment of the plastic wastes only.

The infectious and sharp wastes are disposed directly in the burial pit.

In the study sites, the safe disposal of medical waste is always not considered very important and handled in a very professional manner. They have lack of effective systems of tracking waste generators, and follow specified regulations for segregation, collection, treatment and disposal of medical waste. At the very generation point, the waste should be segregated into bio-hazardous, non-bio-hazardous, sharps, toxins, pharmaceuticals, carcinogens and ordinary solid waste, etc. and stored in designated bags and bins with identification tags and or barcodes. This minimizes the actual volume of potentially infectious or dangerous medical waste to almost one quarter and makes the disposal less costly and more effective. Overall the following the findings of the study are as follows:

- The level of awareness on health care wastes among the waste handlers is not satisfactory enough to manage the waste systematically; while the nurses and staffs are found that they have awareness about the health issues.
- Cleaners segregate the used sharps instruments (mainly the syringe-needles), saline bags, blood bags and test tubes from the kitchen and non-hazardous wastes for sale (resale) or reuse.
- In most cases, cleaners do not wear safety gowns, masks, gloves or protective clothing.
- Both hospitals considered in the study dispose their domestic wastes in the local bins.
- Lack of in depth training in health care waste management among some personnel of the hospitals are observed.
- The process of collection, segregation and disposal of hospital waste is not performed according to recommended standards, and hence patients, visitors, society and the environment are exposed to the dangers of such waste.
- Treatment of plastics for recycling under PRISM (Project in Agriculture, Rural Industry, Science and Medicine) is performed in the open place in Matuail land fill site which is not healthier enough for such act as flies roam around the site.

CONCLUSION

Disposal of medical wastes is one of the leading environmental issues in Bangladesh. Now a day, the management of medical wastes has received attention in most of the health care establishments due to their potential environmental hazards and public health risks. The guidelines for the proper management of medical wastes are not strictly followed in the hospitals. The segregation of wastes at the point of generation is very minimal. Some parts of the wastes are disposed off to the nearest corporation dustbins. It is also found that some medical staffs even earn some money by selling used syringes and other medical wastes. Most of the healthcare staffs are not aware of the proper management of wastes. Adequate and effective waste-management facilities are absent in the hospitals. Besides, the allocation of budget in the hospital waste management is not enough. PRISM Bangladesh, a reputed national NGO in Bangladesh, is now working for medical waste management in association with the DCC. PRISM Bangladesh is also involved in training relevant personnel of different HCE for increasing awareness and proper in-house management of medical wastes.

To avoid the risk of health effect from the wastes, it necessities to formulate rules and regulations, develop systems, and financial support. It is essential to treat the infectious waste before dumping them into the DCC dumping grounds. Within hospital, waste routes can be designated to avoid the passage of waste through patient care areas. Separate time can be earmarked for transportation of bio-medical waste to reduce chances of it's mixing with general waste. Training programme on safe handling of medical waste can be organized for medical staff. Finally, a public awareness campaign for proper management of medical waste would be effective in keeping up the city environment safe.

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