



AN ASSESSMENT OF MEDICAL WASTE DISPOSAL METHODS IN JALINGO METROPOLIS, TARABA STATE NIGERIA

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ABSTRACT

In recent times, improper medical waste disposal presents peculiar environmental and health challenges in developing countries (Nigeria inclusive). This study assesses the medical waste disposal practices in the study area. An inventory of the waste generated in each of the sampled hospital/clinics in the study area was carried out. The type of waste generated was identified through direct observation and use of questionnaire. Three instruments, questionnaire administration, in-depth interview and participant observation strategy/discussion were adopted in this study. The result of the findings shows that there was no sanitation department or waste manager responsible for medical waste management in the private hospitals/clinics. Most of the medical waste handlers, particularly in the private hospitals/clinics do not have formal training in medical waste management techniques. The study findings show that none of the health institutions surveyed treated its medical wastes before disposing of it into the municipal dumpsites or otherwise. Waste management practices employed by the surveyed hospitals/clinics included disposing their waste through burying, burning and use of incinerator. The tertiary health institutions in the study area incinerate their wastes in open incinerators without safety devices. This study recommends the need for a legislation that will help enforce standard practices in the handling of medical waste.

KEY WORDS: Assessment, Disposal, Management, Medical waste, Sanitation.

INTRODUCTION

The management of waste poses a major problem in most developing countries of the world, especially hospital waste. Recently, medical waste disposal has posed even more difficulties with the appearance of disposable needles, syringes, and other similar items. Since the development of disposable medical products in the early 1960s, the issue of medical waste has confronted hospitals and regulators. Previously, reusable products included items such as linen, syringes, and bandages; they were sterilized or disinfected prior to reuse, and principal waste product was limited to human pathological tissue. Waste generated by hospitals/clinics includes a broad range of materials, from used needles and syringes to soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceuticals, medical devices and radioactive materials. In Nigerian medical waste falls under the category of infectious waste (FEPA, 1991). Within this category bare culture and stock infectious agents, pathological waste, waste from surgery or autopsy that were in contact with infectious agents, sharps (hypodermic needles, syringes, scalpel blades), waste from human blood and products of blood and laboratory waste (Bassey *et al.*, 2006). This class of waste require a particular type of management rather than being lumped with the rest of the lot. In recent times, medical waste because of their nature presents peculiar environmental and health challenges especially in developing countries (Nigeria inclusive). The health hazards due to improper medical waste management affect not only hospital occupants but also spread into the vicinity of a hospital. The problem of occupational health hazards arising from medical waste is not well publicized as there is a lack of

information (Manyele, 2004a). The general public's health can also be adversely affected by medical waste. Improper practices, such as dumping of medical waste in municipal dustbins, open spaces and water bodies, which is often the case in most developing countries, can lead to the spread of diseases. In most urban areas in Nigeria there are often no systematic approaches to medical waste disposal. Hospital wastes are simply mixed with the municipal waste in collecting bins at roadsides and disposed off similarly. Some wastes are simply buried without any appropriate measure. As a result, syringes are often reused, mixed in with everyday garbage, or even abandoned in public areas, exposing health workers, patients, and communities to unnecessary risk and contributing to the estimated 23.5 million new HIV, hepatitis B, and hepatitis C infections transmitted every year through needle reuse and accidental needle stick injuries. And as developing-world health systems grow stronger and better care reaches more people, castoff medical waste is increasing. Also, the emergence of an army of human scavengers in recent times who make their living from refuse dumps have added another dimension to the general concern on medical waste disposal. These youths who comb refuse dumps are prone to exposure to toxic and dangerous chemicals (Ayuba, 2008). The improper disposal of medical waste causes serious environmental problems in terms of air, water and land pollution. Manyele (2004b) observed that environmental problems can arise from the mere generation of medical waste and from the process of handling, treatment and disposal. Poor management of medical waste potentially exposes health care workers, waste handlers, patients and the community at large to infection, toxic effects and injuries, and risks polluting the

environment. It is essential that all medical waste materials are segregated at the point of generation, appropriately treated and disposed of safely to reduce its harmful impact on the environment. Various aspects of waste management has been studied but not much has been done in relation to medical waste from hospitals/clinics as an entity in Nigeria and Taraba State in particular compared to what is obtainable in developed countries. Given the increasing number of clinics and hospitals (private/public) in the Metropolis, it has become necessary to examine what happens to the medical waste generated in the clinics and hospitals in the study area. This study therefore seeks to understand what happens to medical waste generated in the health institutions (hospitals/clinics) in the study area. Particularly it seeks to know who handles the medical waste, how and where it is disposed and the safety of the observed waste disposal methods in the study area. It also seeks to know if there is elaborate system of medical waste treatment and safe disposal of medical waste in the various hospitals/clinics in the study area.

MATERIALS AND METHODS

An inventory of the waste generated in each of the sampled hospital/clinics in the study area was carried out. The type of waste generated was identified through direct observation and use of questionnaire. In addition, the pharmacists and nurses were interviewed with a view to obtaining an estimation of the number of sharp/needle items used every day. Using a list obtained from the Taraba State Health Service Management Board, 6 private hospitals/clinics and the Federal Medical centre and State Specialist Hospitals which provide tertiary health services were selected for this study. In each hospital/clinics, the questionnaire was administered to the administrative staff, doctors and nurses who were randomly selected for this purpose.

Study area

Jalingo LGA is the capital of Taraba State. It is located between latitude 8°47' to 9°01'N and longitudes 11°09' to 11°30'E in north eastern Nigeria. It is bounded to the North by Lau LGA, to the East by Yorro LGA, to the South and West by Ardo Kola LGA. It has a landmass of about 195.071 km². Jalingo LGA has a population of 139,845 people according to the 2006 population census, with a projected growth rate of 3% (Shawulu *et al*, 2008). Presently, it has a projected population of 156,606 in 2010 based on the 2006 population census. The LGA has 10 wards (Turaki 'A', Turaki 'B', Sintah 'A', Sintah 'B', Majidadi, Sarkin Dawaki, Kachalla Sembe, Barade, Kona and Yelwa). The major ethnic groups of Jalingo LGA are the Fulani, Jibu Kona and Mumuye. Other ethnic groups include Hausa, Jenjo, Wurkum and Nyandang. Hausa language is widely spoken as a medium of communication for social and economic interactions (Oruonye and Abbas, 2010). There are 2 tertiary health care centres (Federal Medical Centre and State Specialist Hospital), 6 secondary (mainly private hospitals/clinics) and 30 primary health care facilities located within Jalingo LGA with about 1004 hospital beds.

Data collection

Three instruments, questionnaire administration, in-depth interview and participant observation strategy/discussion

were adopted in this study. The questionnaires were administered to the hospital administrators, nurses, doctors and sanitation staff/cleaners where they exist. The existing waste management policy with respect to collection, storage, transportation and final disposal were evaluated. Information regarding quantities and waste types generated and profile of waste handlers were collected through administered questionnaires. The discussion was organized to obtain additional information from respondents and heads of units and wards as well as use the responses to validate some of the results from the questionnaire and in-depth interview. In total, 60 questionnaires were administered in the hospitals/clinics in the study area. Three (3) questionnaires were administered in each of the private hospitals/clinics selected (1 questionnaire each to a nurse, doctor and administrator) and 21 each for the Federal Medical Centre and State Specialist Hospital. This includes 5 administrators, 8 hospital unit/ward heads and 8 cleaners/sanitary department staff.

Secondary data were obtained from published materials, journals and magazines. The frequency counts and item analysis method were used to analyse the data collected. The number and percentage of respondents response were computed, after which the respondents response were tallied and a comparison was made of the individual items of high and low response.

RESULTS

The result of the findings shows that medical waste generated in the hospitals and clinics include used needles and syringes, soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceuticals, medical devices and non generate radioactive materials. 26.7% of the waste generated is needles and sharps. The tertiary health institutions use an average of 500-1000 sharps/needles daily while the private health institution 100-200 sharps/needles daily. The type of waste receptacles used in the hospitals/clinics in the study area, vary as shown in Table 1 below;

The method of waste disposal adopted in the hospitals/clinics include incinerator (50%), offsite commercial disposal (16.7%) and onsite disinfection (11.6%) as shown in table 2 below;

The result of the findings shows that the tertiary health institutions (91.7%) in the study area have sanitation department while the private hospitals/clinics (8.3%) do not have sanitation department. 76.7% of the hospitals and clinics claimed that they have waste management policy while 23.3% does not. The medical waste generated are disposed within the hospitals/clinics (40%). Major waste disposal site outside the hospital/clinics (26.7%) and landfill outskirts of the town (26.7%) as shown in Table 3 below; The persons responsible for waste disposal in the study area include the cleaners (73.4%) and state sanitation department as shown in Table 4 below; The findings of the study shows that 50% of the waste handlers are Secondary school certificate holders while 28.3% are graduates (Table 5) most of whom are found in the tertiary health institutions. The findings from the study shows that there are procedure for safe waste handling in the hospitals/clinics (78.3%) mainly in the tertiary health

institutions, while others (21.7%) particularly the private hospitals/clinics do not have such safe waste handling procedure. About 60% of the respondents claimed that the segregate the medical waste generated in their hospitals/clinics before disposal while 40% does not. Also,

83.3% of the respondent claimed that they employ waste minimization strategy in their hospitals/clinics, while 16.7% do not. The current management practices employed in the hospitals/clinics in the study area are presented in Table 6 below.

TABLE 1. Type of waste receptacle used in hospital/clinic

S/NO	Type of waste receptacle used in hospital/clinic	Frequency	Percentage
1	Open waste bin	4	6.7
2	Close waste bin	27	45
3	Close plastic bags	6	10
4	Disposable waste bags	2	3.3
5	Incinerator	6	10
6	Punctured proof for sharps/needles	2	3.3
7	Open and close bin	2	3.3
8	Open bin, close bin, close plastic bags	1	1.7
9	Disposable waste bags and close bin	1	1.7
10	Close bin and safety boxes	4	6.7
11	Close bin and Punctured proof for sharps/needles	5	8.3
12	Total	60	100

TABLE 2. Method of waste disposal adopted in the Hospitals/clinics in the study area

S/NO	Method of waste disposal	Frequency	Percentage
1	Use of incinerator	30	50
2	Offsite commercial disposal	10	16.7
3	Onsite disinfection	7	11.6
4	Open burning	1	1.7
5	Waste disposal container	1	1.7
6	Onsite disinfection and waste disposal container	1	1.7
7	Use of incinerator and onsite disinfection	2	3.3
8	Offsite commercial disposal and onsite disinfection	8	13.3
9	Total	60	100

TABLE 3. Sites of medical waste disposal in the study area

S/NO	Site of medical waste disposal	Frequency	Percentage
1	Within hospital premises	24	40
2	Major waste disposal outside	16	26.7
3	Landfill outskirts of town	16	26.7
4	Boys using wheelborrow	2	3.3
5	Burnt outside the clinic	2	3.3
6	Total	60	100

TABLE 4. Persons responsible for waste disposal in the hospitals/clinics

S/NO	Persons responsible for waste disposal in clinics	Frequency	Percentage
1	Cleaners	44	73.4
2	State sanitation dept.	7	11.7
3	Hired hands	1	1.7
4	Cleaners and task force on sanitation	2	3.3
5	Doctors and task force on sanitation	2	3.3
6	Nurses and cleaners	2	3.3
7	Cleaners and sanitation groups	2	3.3
8	Total	60	100

TABLE 5. Profile of medical waste handlers in hospitals/clinics in the study area

S/NO	Profile of medical waste handlers	Frequency	Percentage
1	Graduate	17	28.3
2	OND/NCE holder	2	3.3
3	SSCE/Grade II holder	30	50
4	Primary school certificate	4	6.7
5	Illiterate	4	6.7
6	Graduate and Primary school certificate	2	3.3
7	SSCE holders and Persons with informal education	1	1.7

8	Total	60	100
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TABLE 6. Current waste management practices in hospitals/clinics in the study area

S/NO	Current waste management practices	Frequency	Percentage
1	Burying	2	3.3
2	Close and open incinerator	1	1.7
3	Close bin disposal system	2	3.3
4	Dispose after collection	4	6.7
5	Incinerator	5	8.3
6	Burying	4	6.7
7	Carrying in wheelbarrow	2	3.3
8	Segregation and disposal	12	20
9	Burning and incinerator	3	5
10	Burying and incinerator	13	21.7
11	None	12	20
12	Total	60	100

DISCUSSION

The result of the findings shows that there was no sanitation department or waste manager responsible for medical waste management in the private hospitals/clinics, rather sanitation in the hospitals/clinics is overseen by junior staff, some of whom has no any formal education, while others are secondary school certificate holders. The tertiary health care centres had sanitation officers some of whom are graduate and directly responsible for handling medical waste generated in the hospitals/clinics in the study areas. Most of the medical waste handlers, particularly in the private hospitals/clinics do not have formal training in waste management techniques and hospital/clinic administrators pay very little or no attention to appropriate management and disposal of medical waste. Bassey *et al* (2006) observed that medical waste management has received very little attention in waste management process in Nigeria. Neither the government nor hospital authorities pay proper attention to its management. It is not surprising then to see many hospitals, clinics and health centres disposing medical waste any where they found convenient in public dumpsite. The poor and unregulated manner in which the clinics/hospitals dispose medical waste pose serious health hazard to the people living within the vicinity of the health care institutions in the study area. All the private hospitals/clinics surveyed dispose the medical waste generated into municipal dumpsites without pre-treatment. This situation is very unhealthy for the people living around such hospital/clinics or dumpsite as the case may be. Others, particularly the tertiary hospitals/clinics burn their waste in incinerator and open pits. Burning and incineration of medical and municipal waste have been linked to severe public health threat and pollution resulting in the release of toxic dioxin as well as mercury and other toxic substances into the environment (Bassey *et al*, 2006). These substances produce a remarkable variety of adverse effects in humans at extremely low doses (Peele *et al*. 1998). Putrefaction occurs in portions of refuse, which have not been fully burnt and add to air pollution through foul smells. Bassey *et al*,(2006) observed that sanitary landfill can lead to pollution of ground water if not properly managed. 11.6% of the hospitals/clinics surveyed adopt onsite disinfection, while 40% bury the medical waste generated within the hospital/clinic premises. This

has the potential to pollute ground water in the study area, thereby exposing the population to health hazards. Only 20% of the hospitals/clinics surveyed in the study area admit segregating the medical waste generated before disposal. Medical waste segregation is an important treatment option in the effective management of medical wastes. Segregation reduces medical waste and thus reducing the health impacts on the general public after dumping. The inability of the hospitals/clinics to adopt this method may be due to lack of trained waste managers in the hospitals/clinics surveyed.

Medical Waste Management

Treatment of medical waste constitutes a method for rendering it non infectious prior to disposal in a landfill or other solid-waste site. The treatment technologies currently used for medical waste include incineration, sterilization, chemical disinfection, and microwave, as well as others under development. Medical waste management means the management of waste produced by hospitals and health care centres using such techniques that will help to check the spread of diseases through it. (Hospital waste Factsheet).

CONCLUSION

This study has shown that none of the health institutions surveyed treated its medical wastes before disposing of it into the municipal dumpsites or otherwise.

Thus the waste management strategies employed by the surveyed hospitals/clinics included disposing their waste through burying, burning and use of incinerator. The tertiary health institutions in the study area incinerate their wastes in open incinerators without safety devices.

RECOMMENDATION

From the findings of this study, it is clear that there is no existing legislation regulating the disposal of medical waste in the country in general and the study area. This study therefore recommends the need to educate and sensitize waste generators of their responsibility to properly manage the medical waste generated in their hospitals/clinics so that their staff, patients, environment and community is protected from its potential harmful effect. This study also recommends the need for both the Federal and State Ministries of Environment and Health to put in place a legislation that will regulate medical waste

generation and management in Nigeria. This legislation will help enforce standard practices in the handling of medical waste. To be effective, this will require adequate preparedness on the part of the Federal/State governments in terms of both infrastructure and skill. There is need for public enlightenment campaign through media advocacy on the dangers associated with medical waste. There will also be need for capacity building through training of medical personnel, particularly medical waste handlers.

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