A STUDY OF WASTE MANAGEMENT OF SAIDU TEACHING HOSPITAL

Bushra Iftikhar[1], Muhammad Jan[2], Khurshid Ahmad[3], Satea Arif [4],
1.Department of Community Medicine, Khyber Medical College, Peshawar
2.Department of Pharmacology, Saidu Medical College, Saidu Sharif, Swat.
3.Department of Community Medicine, Saidu Medical College, Saidu Sharif, Swat.
4.Department of Biochemistry, Khyber Medical College, Peshawar.

ABSTRACT

Objectives: The study was designed to find out the type and quantity of different type of wastes generated in the two wings of Saidu Group of teaching Hospitals. The study also aimed at finding that whether facilities are available in different units for the segregation, storage, disinfection of infectious waste at the onset and methods of disposal of waste within and outside the hospital. Also, types of items reused and their methods of sterilization and the fate of used syringes was found out.

Study Design: Observational

Methodology: The study focus was Saidu Teaching Hospital (STH), a tertiary care hospital providing services to the people of Swat, Malakand, Dir, Kohistan and areas far up to Chitral. Situated 1.5 Km apart STH consists of two administrative units, Saidu Wing and Central Wing.
A qualitative analysis of various aspects of waste management was done by reviewing the available authentic record and discussion with the sanitary and administrative staff of the hospital. All the data was collected according to, and filled in a pre-designed questionnaire.

Results: It was found that Saidu Teaching Hospital generates more than 550 Kg of solid waste and 1295 liters of liquid waste per day, which makes 1.2 Kg/bed/day. As a whole 80% of the waste generated was ordinary garbage, 12% was infectious, 4% was Pharmacological, 3% pathological and 0.8% consisted of sharps.
The provision of facilities for the segregation of waste at outpatient departments, Wards, Operation theatre and Laboratories/Blood Banks were 7.5%, 7%, 20% and 28.5% respectively and for storage of waste before disposal at outpatient departments, Wards, Operation theatre and Laboratories / Blood Banks were 22%, 8%, 0% and 28.5% respectively.
Disinfection of infectious waste at outpatient departments, wards, operation theatre and laboratories / blood banks was 10%, 12%, 0% and 17% respectively. Methods used were treatment with phenyl and burning in open air.
About the removal of waste from hospital premises, 78% mentioned sweepers, 17% said rig pickers while 5% said that there is no one to take away the waste.54% admitted that they threw the syringes as such in the bins.
The study found that 80% of the waste went to the municipal corporation land fills, the rest was either burnt or thrown as such into the water channel passing through the hospital (12% & 8% respectively). 67% blamed the administration, 25 % held the doctors responsible, 37% charged the nursing staff and 67% blamed the sweepers for the faulty management of hospital waste.

Conclusion: It is thus concluded that Saidu Teaching Hospital generates huge amount of solid and liquid waste, which is not properly disposed off currently, therefore it needs modern and scientific waste disposal systems.
Keywords: Waste Management, hospital waste management, waste disposal

INTRODUCTION

Hospital waste management is an important and necessary component of environmental health protection. Hospital waste management means the management of waste produced by hospitals using such techniques that will help to check the spread of disease through it.

The management of waste especially hospital waste poses to be a major problem in most of the countries. Disposal of hospital and other medical waste requires special attention since this is supposed to create major health hazards.[1,2] In particular, organic waste poses a serious threat, since they ferment, creating conditions favorable to the survival and growth of microbial pathogens. Hospital waste can cause diseases like diseases of the skin, blood, gastro-intestinal tract, eyes, respiratory tract, mechanical injuries, poisoning, chemical burns etc.[3]

Waste treatment and disposal sites can also create health hazards for the neighborhood. Improperly operated incineration plants cause air pollution and improperly managed and designed landfills attract all types of insects and rodents that spread disease. Recycling too carries health risks if proper precautions are not taken. When waste containing plastics is burnt, dioxin is produced which can cause cancer, birth defects, decreased psychomotor ability, hearing deficits, cognitive defects and behavioral alternations in infants.

According to the World Health Organization and World Bank reports, all the incinerators, without filters, emit a large quantity of carcinogenic gases that have a dangerous effect on environment and public health.

Conventional incineration systems for hospital waste emit large amounts of particulate matter and heavy metals, as well as dioxins, due to the large excess air ratio, so a new technology integrating drying, pyrolysis, gasification, combustion and vitrification are combined in the latest incinerators.[4]

The United States environmental protection agency (EPA) estimates that 3.4 million tons waste is produced annually by health care facilities in the united states. hospitals are the single largest generator of that waste, contributing more than 70 percent of the annual total. Only about 2% of total hospital waste needs to be incinerated to protect public health according to the centers for disease control[5].

The situation is not much different in the rest of the South Asia. In a study in Thialand it was found that the amount of medical waste was 0.41 Kilogram per bed per day. Problems identified were inadequate knowledge in management, improper practices, high incidence of sharp injury at work. Laboratory tests in dustman showed evidence of pulmonary tuberculosis in 3.4%, parasites and intestinal pathogens in stool of 5.1% and positivity for Hbs Ag in 8.5%.[1]

Hospitals in our country produce 16,000 tons of waste annually out of which 2,500 tons is considered to be highly infectious. Around 2 Kg of waste is produced per bed daily out of which 0.6 Kg is risk based. 79 percent of the syringes are being reused without sterilization in Pakistan.[5]

Hospitals, clinics, maternity homes and pathological laboratories in Karachi are estimated to be producing an average 15 tons of hospital waste per day, which comes to around 4,000 tons per year. Although a small portion of it is hazardous and infectious, not separated properly at the source by the municipal agencies, all the hospital waste becomes infectious and may cause hepatitis.[6]

Incinerators for disinfection have been recently installed in a few hospitals in Pakistan and in Peshawar too. But there is no such arrangement in other hospitals.

METHODOLOGY

It was an observational study. A qualitative analysis of various aspects of waste management was done by reviewing the available authentic record and discussion with the sanitary and administrative staff of the hospital. All the data was collected according to and filled in a predesigned questionnaire.

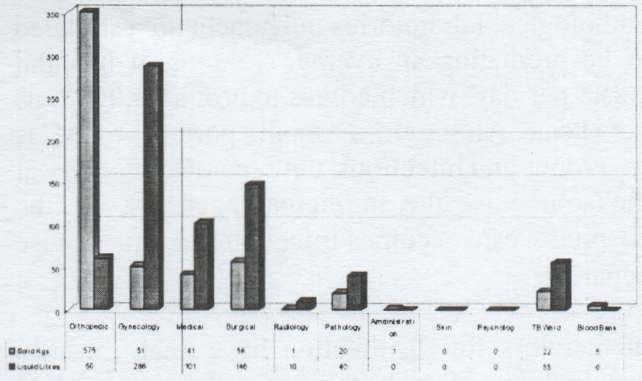
The study focus was Saidu Teaching Hospital, a tertiary care hospital providing services to the people of Swat, Malakand, Dir, Kohistan and areas far up to Chitral. Situated 1.5 Km apart STH consists of two administrative units:

A. Saidu Wing includes Medical Ward, Surgical Ward, Eye Ward, ENT Ward, Children Ward, Casualty Department, Radiology Department, Operation Theaters, ICU, CCU, Pathology Laboratory, Administrative Block, EPI Center, Dentistry Department, Medical Store, Blood Bank.
B. Central Wing includes Medical Ward, Surgical Ward, Gynaecology ward, Orthopaedic Ward, Skin Ward, Psychiatry Ward, Radiology Department ,TB Ward, Pathology Laboratory, Administrative Block, Blood Bank, Medical Store.

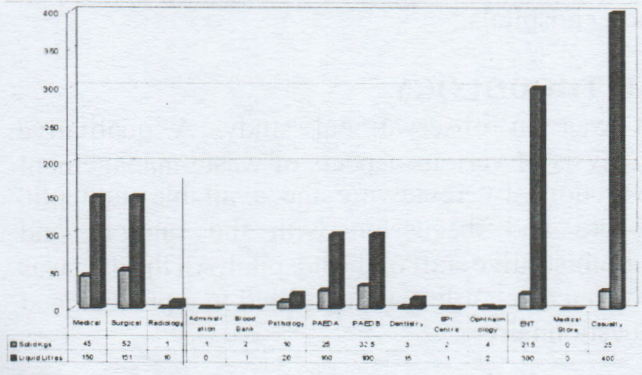
RESULTS

Saidu Teaching Hospital generates more than 550 Kg of solid waste and 1295 liters of liquid waste per day, which makes 1.2 Kg/bed/day. Waste generated at different units of Saidu wing and Central wing is given in Graph 1 & 2.

Waste Generated At Central Wing

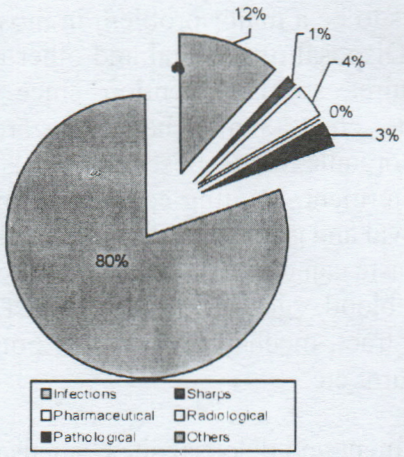


Waste Generated at Saudi Wing



As a whole 80% of the waste generated was ordinary garbage, 12% was infectious, 4% was Pharmacological, 3% pathological and 0.8% consisted of sharps (Graph 3). Only dentistry department at Saidu Wing claimed to generate a very small amount of radioactive waste as well

Percentage of Wastes

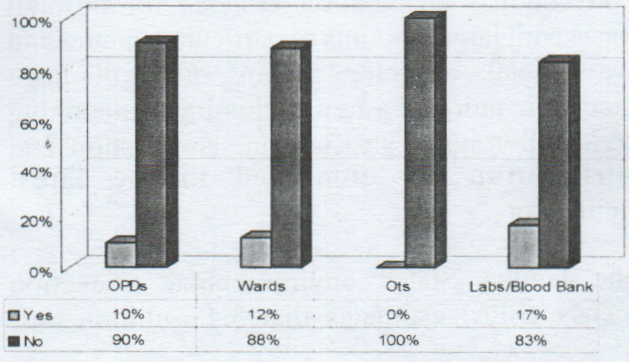


The provision of facilities for the segregation of waste at outpatient departments, Wards, Operation theatre and Laboratories/Blood Banks were 7.5%, 7%, 20% and 28.5% respectively.

The provision of facilities for the storage of waste before disposal at outpatient departments, Wards, Operating theatre and Laboratories / Blood Banks were 22%, 8%, 0% and 28.5% respectively.

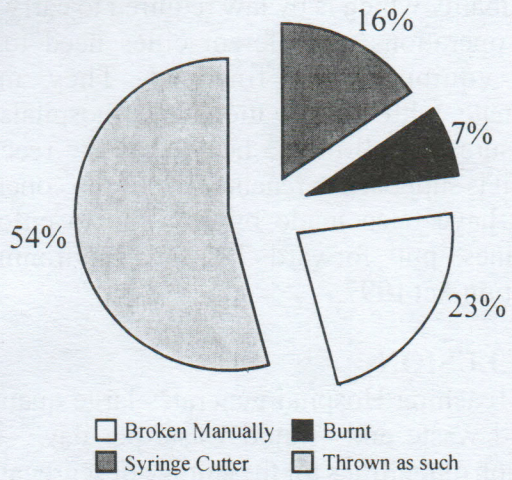
Disinfection of infectious waste at outpatient departments, Wards, Operation theatre and Laboratories / Blood Banks was 10%, 12%, 0% and 17% respectively. Methods used were treatment with phenyl and burning in open air.(Graph 4)

DISINFECTION OF WASTES



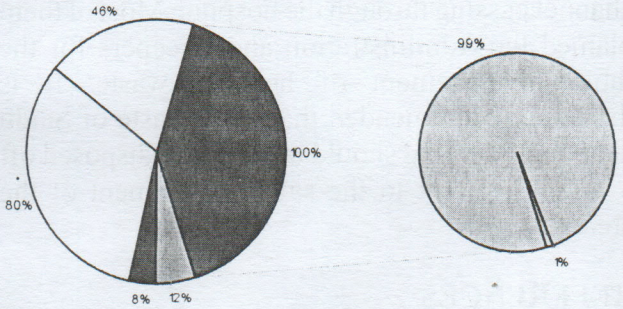
Fifty four percent admitted that they threw the syringes as such in the bins, while 23% claimed to use syringe and needle cutters. 23 % said that they break the needles manually and throw the syringes as such while 7% claimed to burn them.(Graph 5) Seventy eight percent of the departments said that the hospital sweeper on duty takes the waste away, 17% said that they had seen rig pickers taking away at least some waste outside the department. 5% said that there was no one to take away the waste until requested or they did it all by themselves.

DISPOSAL OF SYRINGES



The study found that 80% of the waste went to the Municipal Corporation land fills. The rest was either burnt or thrown as such into the water channel passing through the hospital, 12% & 8% respectively (Graph 6).

ULTIMATE DISPOSAL



Sixty seven percent blamed the Administration, 25 % held the Doctors responsible, 37% charged the Nursing staff and 67% blamed the sweepers for the faulty management of hospital waste.

Different waste items generated at Saidu Teaching Hospital includes Food waste, Paper, Plastic, Used linens, Glass, X-ray film, Cotton, Syringes, Infusion bottles, Drug containers, expired and leftover drugs; mercury, splints, POP, blood samples, slides, lancets and packing material etc. The major items reused were gloves, gowns, surgical instruments, towels, abdominal packs, anaesthesia equipment, test tubes, slides, intubation tubes, dentistry equipments, specula and tongue depressors, even Folly's catheter (in labour room).

Autoclave, Boiling and treatment with hypochlorites were the means to sterilize the above mentioned equipments.

DISCUSSION

Hospital waste management is one of the most neglected area of the managerial process in Saidu Teaching Hospital. Neither the government nor hospital authorities pay proper attention to this matter. Unhygienic waste disposal by many hospitals, clinics and healthcare centers in Saidu is posing serious health hazards to the city dwellers in general and to the people living in and within the vicinity of the hospitals in particular. Safe handling of bio-medical wastes is a matter of serious concern all over the world. It has become a grave issue in developing countries.[7] Thousands of tons of hospital waste including infectious waste are being dumped in open garbage bins. Most governments in developing countries are coming out with regulations that require hospitals to address this issue.

It appears through this study, that all wastes, such as potential infectious waste, waste from office, food, construction debris, infectious, sharps, and hazardous chemical materials are all mixed together while they are being generated, collected, transported and finally disposed of in nearby municipal waste bins without any pre-treatment whatsoever. An unhealthy and hazardous environment exists in and around these hospitals, affecting patients, hospitals staff and other people. Scavengers who collect waste from dust bins are at risk from sharps, pharmaceuticals and chemicals and from direct contact with infectious materials.

Imposing segregation practices within hospitals to

separate biological and chemical hazardous wastes (about 20% of the waste stream) will result in a clean solid waste stream. If proper segregation can be achieved through training, clear standards, and tough enforcement; it will effectively decrease infectious waste.

In a study conducted in eight tertiary teaching hospitals in Karachi it was revealed that only two (25%) hospitals were segregating sharps, pathologic waste, chemical, infectious, pharmacological and pressurized containers at source. For handling potentially dangerous waste two (25%) hospitals provided essential protective gears to its waste handlers. Only one (12.5%) hospital arranged training sessions for its waste handling staff regularly.[6]

In another study at Rawalpindi it was found that the average waste generation rate in different wards was 1.35 Kg/bed/day. The waste was neither properly segregated, nor transported and dropped in a scientific manner, while solid waste was being dumped in the open within the hospital grounds, to be removed sporadically by municipality. Untreated liquid waste was being discharged into the sewage system.[8]

It has been observed in the study that deliberate negligence and ignorance of the hazards that the wastes poses to the environment and human population are the major causes that make the staff members un-inclined to the proper handling of the waste.[9]

It is observed that doctors are aware of the risk of HIV, Hepatitis B and C whereas the auxiliary staff had very poor knowledge about it.[10]

According to another survey conducted at Faisalabad, it was revealed that the hospital staff neither had knowledge regarding infectious hospital waste nor were trained/ properly equipped in the management of such specific waste. The infectious waste was not being segregated at the source and it was observed that the infectious waste was burnt frequently with other wastes at the central hospital waste disposal facility.[11]

The proper way to dispose of hospital waste is by means of the high-tech incinerators but it requires a lot of money, and in the absence of huge funds the people at junior levels merely make it to provide basic facilities of health to people, putting aside waste management procedures.[4]

It seems evident that until the hospitals including Saidu Teaching Hospital get sufficient staff and funds, waste management will stay jeopardized.

However with the present resources they can at least manage things like segregation of wastes. The Municipality which is by law required to carry out waste operations in different cities need to be better equipped and financed. They must coordinate with organizations like hospitals to make sure that all of the hospital waste reaches where it is supposed to reach. Till now no concrete efforts have been made by any one to enforce guidelines put forward by the Environment Protection Act 1997.

CONCLUSION

Saidu Teaching Hospital generates large quantity of solid waste and liquid waste per day, The provision of facilities for the storage or segregation of waste, or provision of separate containers for different types of waste anywhere were very few. Only 1/5th of the infectious waste was disinfected before disposal & 80% of the waste went to the Municipal corporation land fills. The rest was either burnt or thrown as such into the water channel passing through the hospital. Most of them blamed the Administration and sweepers for the faulty management of hospital waste. It is therefore recommended that solid waste of Saidu Teaching Hospital should be properly disposed off to minimize risk to the safe environment of the area.

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Address for Correspondence
Dr. Bushra Iftikhar,
H. No 70, Street 4, Sector H-2,
Phase II, Hayatabad, Peshawar
Tel: 091-5818772