

Knowledge of Hospital Waste Handlers Regarding Preventive Measures

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ABSTRACT

Objectives: To determine the knowledge about treatment of hospital waste, to determine the socio-economic status and vaccination status of hospital waste handlers (sanitary workers) in Sheikh Zayed Hospital (SZH), Rahim Yar Khan and to assess the knowledge regarding the preventive measures during hospital waste handling.

Methodology: This cross sectional study was conducted in Sheikh Zayed Hospital, Rahim Yar Khan in March 2011. 60 study participants (Sanitary Workers) who have given informed verbal consent were included. A pre-designed, pre-tested questionnaire was used to record different variables relevant to the objective of study, such as information on protective measures, segregation of waste, and training on hospital waste handling, its disposal and vaccination status etc. Data was entered tabulated and analyzed.

Result: Mean age of the participants was 32.82 years and majority were male (58%), Christian (87%), 42% of subjects were illiterate, 37% had education of primary, 15% had secondary level of education & 5% had education matric and above. 93% of the participants didn't have any training on hospital waste management. 15% had knowledge of Pathological waste, 63% infectious waste, 82% chemical waste, 62% General waste whereas none of the workers had any knowledge about pharmaceuticals and radioactive type of waste. 17% reported knowledge of hepatitis, 18% hepatitis and tuberculos, 7% transmission of diarrhea. When asked about knowledge of protective measures, 70% subjects have knowledge of both masks and gloves, only 3% have knowledge of all the fours that is masks gloves, gowns and long shoes. 93% have knowledge of waste collection baskets. 68% knowledge of steps of segregation of hospital waste. 62% have knowledge of storage of waste in separate areas in ward.

Conclusion: The major problem in proper waste handling is lack of awareness of the workers handling the waste. Our study showed that the waste handlers were mainly non-muslims, majority had no proper training, with low level of knowledge regarding waste types, diseases transmitted, protective measures and steps of waste handling. We suggest that there should be proper training of hospital waste handlers and administration in each hospital should take this issue on priority.

Key words: Solid waste treatment, hospital waste, echo system

INTRODUCTION

Any unwanted residual material which cannot be discharged directly, or after suitable treatment can be discharged in the atmosphere or to a receiving water source, or used for landfill is *waste*. (Wilson, 1981), Infectious wasters are all those substances which cannot be reesterilized or reused within or brought into patient care. (Rearly, 1981) Hospital waste refers to all waste, biological or non biological, that is discarded and is not intended for further use. A modern hospital is a complex multidisciplinary system which consumes thousands of items for delivery of medical care and is part of physical environment. All products consumed in hospital have some unuseable left over. i.e. Hospital waste. This waste is great

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threat to ecological balance by polluting environment.

Types of Hospital Waste:-Categories of Hospital waste as classified by the World Health Organization (WHO) are:-

- General waste, including material such as unwanted paper. This waste harmless and does not need special handling.
- Pharmaceutical waste, like drugs and chemicals.
- Sharps, which are disposable needles, syringes etc.
- Pthological waste, which includes tissues, organs, body parts, human flesh, fetuses, blood and body fluids.
- Infectious waste, which includes material which contains sufficient concentrations, tissues / swabs;
- Genotoxic waste, like chemotherapy drugs.

- Radioactive waste, contaminated with radioactive substances,
- Other waste from the offices, kitchens, rooms, including bed linen, utensils, paper etc.

Hospital waste was brought into focus in 1983 when WHO European office convened a working group at Bergen. Medical Specialists, hospital engineers, administrators from 19 countries participated & concluded that it required a system i.e. approach involving awareness, segregation & source reduction of radio-active waste.

Globally, developed countries generate 1 to 5 kg waste/bed/day and in developing countries, meager data but figures are lower. 1-2kg/patient/day. According to WHO report, composition of hospital waste: 85% non hazardous waste, 10% infective waste, 5% non-infectious but hazardous. (Chemical, Pharmaceutical etc). Regarding Pakistan, data is scarce. According to Environment Protection Agency (EPA) study on hospital waste 20% of the health care waste generated every day in city is infectious waste. In Pakistan, disposal of health care waste is not safe. Hospital waste is considered dangerous because it may possess pathogenic agents and can cause undesirable effects on human health and the environment. Hospital, or any healthcare waste, should be handled, treated or disposed of correctly; otherwise it can spread disease, poisoning people, livestock, wild animals, plants and entire ecosystem.

Exposure Routes for Hospital Waste: The routes of health care workers exposures to hazardous substances contained in hospital waste include ingestion, inhalation and dermal absorption or through skin openings. Individuals are exposed to sources of microorganisms by three primary routes:

a) Contact Transmission:

- **Direct** - Organisms is transferred directly from one person to another, e.g. scabies or herpetic whitlow.
- **Indirect** – Organisms is transferred through contaminated intermediate object or person, e.g. hands or contaminated patient care equipment.

b) Droplet Transmission: Relatively large (>5 microns) droplet.

c) Airborne Transmission: Droplet nuclei (<5 microns)

Classification of Hazardous Waste: The hazards can be classified in the following categories;

1. Biological (Bacteria such as tuberculosis, viruses)
2. Chemical Hazards (medications, solutions or gases)
3. Physical hazards (ionizing radiation, laser, noise and electricity). Sharp objects.

What Makes Hospital Waste Hazardous:

1. Chemical – medications, Solutions, or

2. Bacteria's like TB, Hepatitis B and C,
3. Gases, ethylene oxide, formaldehyde, glutaryldehyde, waste anaesthetics gases, nitrous oxide,
4. Chemotherapeutic Agents.
5. Laser smoke and
6. Aerosolized medications such as Pentamidine.
7. Physical
8. Ionizing Radiation
9. Lasers
10. Noise and
11. Electricity

Approach for Hospital Waste Management

A. Collection of bio-medical waste:

Collection of bio-medical waste should be done as per Bio-medical waste (Management and Handling) Rules. At ordinary room temperature the collected waste should not be stored for more than 24 hours.

General Waste: The 85% of the waste generated in the hospital belongs to this category. The safe disposal of this waste is the responsibility of the local authority. Through usual measures

Bio Medical Waste: It constitutes 15% of hospital waste and be disposed as:-

- Deep burial
- Autoclave and microwave treatment.
- Shredding
- Secured landfill
- Incineration

B. Safety Measures during Bio-medical waste disposal:- It should be ensured that:-

1. All handlers should be aware of the nature and risk of the waste.
2. Written Instructions, be adopted in the event of spillage / accidents.
3. Protective gloves provided and used.
4. Workers are protected by vaccination against tetanus and hepatitis B.
5. Proper training be imported to waste handlers.

Improper Hospital Waste Management Are Due To:-

- a. Improper handling; Unsafe actions:, handling without personal protective equipment.
- b. Poor Storage (e.g high temperature conditions combined with prolonged storage time before treatment),
- c. Manual Transportation for longer distances.
- d. Use of uncovered containers instead of closed plastic bags.
- e. Exposures times beyond acceptable limits and
- f. Lack of adequate worker and equipment decontamination process / procedures.

Fundamental Elements to Prevent Transmission of Infectious Agents in Healthcare Settings

- Administrative Measures.

- Education of Health Care workers, patients and families.
- Hand Hygiene.

Personal Protective Equipment (PPE)

When selecting PPE consider the highest level hazard present, the source of the hazard, and the potential for simultaneous exposures:-

- Goggles
- Proper, Tough, Long Clothing,
- Lab coat, scrub suits, gowns (long pants only, no open toad shoes),
- Proper Gloves.

Who are More Vulnerable: Most commonly the persons at risk of hospital waste include doctors, para-medicals, attendants, visitors and sanitary workers. Sanitary Workers who belong to lower class of community and are less educated are most vulnerable.

METHODOLOGY

This Cross-Sectional Study was conducted in Sheikh Zayed Hospital Rahim Yar Khan during March 2011. Study participants were members handling waste (These include ward attendants, sanitary workers and transporters of waste). A total of 40% of all 150 hospital waste handlers, which makes 60 study subjects were selected randomly in Sheikh Zayed Hospital, Rahim Yar Khan. A pre-designed, pre-tested questionnaire was used to record different variable that included demographic as well as relevant to the objective of study, such as knowledge of protective measures, disease transmitted, segregation of waste, any training on hospital waste handling, disposal and vaccination status etc. Data was collected, tabulated analyzed as sex, religion, educational status, vaccination status, knowledge of preventive measures etc.

OBJECTIVES

1. To assess the knowledge of the hospital waste handlers (Sanitary Workers) regarding the protective measures during hospital waste handling in Sheikh Zayed Hospital, Rahim Yar Khan.
2. To assess the religious and educational status of hospital waste handlers.
3. To assess the knowledge of hospital waste handlers about types of hospital waste and disease transmitted from it.
4. To determine the knowledge of hospital waste handlers regarding steps of hospital waste management.
5. To assess the status of hospital waste handlers regarding hospital waste management.

RESULTS

This cross sectional study was conducted by Batch G of 4th year MBBS under the supervision of Head of Department of Community Medicine, Dr. Hafiz Muhammad Yar Malik and Medical Superintendent, Dr. Capt ® Mushtaq Ahmad Ch. Sheikh Zayed Hospital Rahim Yar Khan. A total of 60 study subjects were included in this study. Mean age of the participants was 32.82 years and majority were male (58%), Christian (87%), 42% of subjects were illiterate, 37% had education of primary, 15% had secondary level of education & 5% had education matric and above. 93% of the participants didn't have any training on hospital waste management. 15% had knowledge of Pathological waste, 63% infectious waste, 82% chemical waste, 62% General waste whereas none of the workers had any knowledge about pharmaceuticals and radioactive type of waste. 17% reported knowledge of hepatitis, 18% hepatitis and tuberculos, 7% transmission of diarrhea. When asked about knowledge of protective measures, 70% subjects have knowledge of both masks and gloves, only 3% have knowledge of all the fours that is masks gloves, gowns and long shoes. 93% have knowledge of waste collection baskets. 68% knowledge of steps of segregation of hospital waste. 62% have knowledge of storage of waste in separate areas in ward. Mean age (32.82 years), Std. error of Mean (0.888), Median age (35 years), Mode age (35 years), Standard deviation (6.875), Variance (47.271), Skewness (0.005), Standard errors of skewness (0.309), Kurtosis (-0.308), Standard error of Kurtosis (0.608), Range (30), Minimum (20), Maximum (50).

Religion of study subjects: Islam 87% and christians are 13%.

Table: Education status

Education Status	Frequency	Percentage
Illiterate	25	41.7
Primary	22	36.7
Secondary	10	16.7
Metric +	3	5
Total	60	100

DISCUSSION

This study was aimed to assess the awareness of hospital waste handlers regarding hazards from hospital waste, especially, we focused on the workers who are at high risk of getting infected from various infectious agents while handling waste in hospital. This was a cross sectional study, in which a total of 60 study subjects were included. It was observed that 42% of the study subjects were illiterate, 37% had primary level of education and 16% had secondary

level of education where as 5% of the study subjects had education level of matric and above. In previous study, it was revealed that 46% of workers were illiterate and 49% had attended primary school. Regarding religion of the study subject, it was observed that 87% were Christian, whereas 13% were muslims. A study has reported, that usually, the sanitation staff, support staff, etc. are all people from the low socio-economic group working in this hospitals. They are unskilled, uneducated living in the nearby slum areas. Usually they have a big family to support including an average of four children, wife and two dependents (parents, brother and sister). They are mostly Hindus and Christian. It was observed that 93% of the study subjects had not got any training whereas only 7% had reported of training regarding hospital waste handling. As compared to a study conducted in combines military hospital, where none of the Sanitary Workers received any training in handling of hospital wastes, our study had reported that 7% had got some training regarding waste handling, however, majority (93%) reported that they have got no training.

Regarding knowledge of different types of hospital waste 87% have knowledge of Sharps, 15% had knowledge of Pathological waste. It was observed that 63% of the study subjects have knowledge of the infectious waste. All 100% of the study subjects reported no knowledge of Pharmaceutical waste, radioactive wastes and heavy metal wastes. When asked about the chemical waste 82% reported of having knowledge of chemical waste. It was observed that only 62% of the study subjects have knowledge of General waste category in hospital waste. This shows a low level of knowledge of different types of waste among handlers. A study conducted in Karachi, in 2007, showed similar results, however, in that study the level of knowledge was measured as aggregate as (good, not good), they reported that none of the workers had good knowledge. Additionally, in that study attitude regarding protective measures was reported as 'good' in 38%, whereas practice was reported as 'good' in just 1.5%.

When asked about the disease that are transmitted during waste handling 17% of reported of knowledge of Hepatitis, 18% reported of hepatitis and tuberculosis, 7% reported of having knowledge of transmission of diarrhea, 5% reported of having knowledge of transmission of skin disease, whereas 23% have no knowledge of any disease transmitted during waste handling. When asked about the protective measures during hospital waste handling, 70% of the subjects have only knowledge of both masks and gloves, only 3% have knowledge of all the fours that is masks, gloves, gowns and long shoes.

10% of the sanitary workers said that they were provided with protective equipment. 90% said no protective equipment was provided to them. In a previous study in Karachi, it was reported that 93% of hospital waste handlers were not provided with protective measures. These finding are comparable to our study. Regarding the steps of hospital waste management, it was observed that 93% of the study subjects have the correct knowledge of collection of waste on bedisk. In our study, 68% have correct knowledge of steps of segregation of hospital waste. 62% of the study subjects have correct knowledge of steps of storage of waste in separate areas in ward. 93% of the study subjects have correct knowledge of waste collection baskets. However, only 42% of the study subjects have knowledge of type of waste put in specific basket.

In a study in Karachi, it was reported that overall of Sanitary Workers had poor knowledge of waste handling steps, such as segregation, collection and safe transport. (Sultana Habibullah) in a similar study conducted in 5 hospital in Islamabad, on 259 Sanitary Workers it was found that the majority of sanitary workers were male and were mostly young, almost half of sanitary workers were illiterate and one fourth of them had attend primary school, the knowledge towards hospital waste management among sanitary workers was mainly in poor level, while two thirds had high attitude and more than half had good practice.

A study conducted at CMH, Rawalpindi at Health hazards of hospital waste to Sanitary Workers revealed that 46% of workers were illiterate and 49 % had attend primary school, mean age was 31.8+8.4 years, none of sanitary workers received any training in handling of hospital wastes. They were not provided with protective equipment and not vaccinated against hepatitis B, although some form of segregation of hazardous and non hazardous waste was practiced in CMH Rawalpinid. Majority of 56% of them collected and carried two kinds of wastes in same vehicle 48% of them reported of sustaining one or more injuries at work. Frequently reported injuries were cuts (47%) pricks (34%), falls (15%) and burns (4%), 26% of them reported of contracted skin disease from wastes, while 12% cough ENT disorders, 9% gastrointestinal disorders, 6% respiratory diseases and 8% hepatitis.

CONCLUSION

The major problem in proper waste handling is lack of awareness of the workers handling the waste. Our study showed that waste handlers were mainly non-muslims, majority had no proper training with low level of knowledge regarding waste types, disease transmitted, protective measures and steps of waste

handling. We suggest that there should be proper training of hospital waste handlers and administration in each hospital should take this issue on priority.

SUGGESTIONS

1. Hospital waste handlers should get proper training of waste handling before joining the hospital.
2. Hospital administration should set criteria of minimum education status of waste handlers.
3. Knowledge of waste handlers about different types of waste, its handling and disease transmitted should be improved by conducting training workshops.
4. Their knowledge about different types of disease transmitted during waste handling also needed to be improved.
5. It should be made sure that 100% workers be provided with gloves and masks.
6. All workers should be vaccinated for HBV and their blood screening of HBs Ag, Anti HCV and HIV be done.

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