ORIGINAL ARTICLE

STUDY OF HOSPITAL WASTE DISPOSAL PRACTICE IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Rapid growth in number of hospitals globally is leading to increased hospital waste production jeopardizing humans and environment. This survey was conducted to assess hospital waste disposal practice at a Tertiary Care Hospital.

Material & Methods: This descriptive cross-sectional study was carried out in Tertiary Care Hospital of D.I.Khan, from May 1, 2013 to December 7, 2013. A written consent of hospital administrator and 25 sanitary workers was obtained before hand.Twenty-five units were selected for study including five departments and 20 inpatient wards. Convenient sampling method was used. Study instrument was a checklist and interview from Medical Superintendent and all sanitary workers. Research variables were waste management plan, waste collection, waste segregation, checking reuse of disposal items, internal transport, protection of workers, infectious waste treatment, waste storage, on site disposal and offsite disposal. Data analysis plan was descriptive statistical.

Results: Waste management plan was absent. Waste segregation was practiced in 0% units. Reuse of disposal items was checked in 30% of units. Two wheeled bin containers were available in 100% of units. Zero percent of units had separate colour-coded containers for risk and non-risk waste. Zero percent % workers were provided with protective gear. Sixty percent had incomplete vaccination course against tetanus. Infectious waste treatment prior to disposal was practiced in 0% of units. No temporary central storage site protected from unauthorized scavengers was available for waste within hospital premises. Offsite disposal was done by municipal authorities on irregular basis.

Conclusion: Hospital waste disposal practice is poor and if not improved, may threaten human and environmental health.

KEY WORDS: Hospitals; Infectious waste disposal; Hazardous waste; Environment.

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INTRODUCTION

Waste means materials that are discarded and are not intended to use further.[1] All waste arising from health care facilities is labeled as health care waste.[2] Any waste that is generated during diagnosis,treatment or immunization of human beings, animals or in research work relevant to or in production and testing of biological.[3] Hospital waste management means using such procedures that will not let disease to spread.[4] Hospital waste comprises of hazardous and non hazardous waste. First category includes pathological waste, infectious waste, sharps, pharmaceuticals, genotoxic, chemical and radioactive waste.[5] This category makes 10 to 25% of total hospital waste and is risky for health so needs proper disposal.[6] About 75% to 90% is non hazardous general health care waste comparable to domestic waste.[7,8]

Globally waste production of developed countries is 1 to 5 kg/bed/day while developing countries generate 1 to 2 kg/bed/day.[1] Hospital waste generation rate in U.S, U.K and Taiwan is approximately 7kg/bed/day, 1.67kg/bed/day and 2.5 kg/bed/day respectively.[4] Waste generation figure of Pakistan is 2 kg/bed/day out of which 0.1 to 0.5 comes under risk waste category.[9,10] About 250000 tons of medical waste is produced from all sorts of health care facilities in Pakistan.[10]

Growing number of hospitals, clinics and labs are leading to increased generation of waste and

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are threatening our environment.[11] It has created an alarming situation for local government.[12] It jeopardizes human health directly by causing diseases and injuries but also indirectly by causing environmental pollution.[10,13,14] It is also an aesthetic nuisance. [4] Safety of staff, patient and dependent community is related to proper waste disposal so it is mandatory for protection of all.[6,15] Disposal of hospital waste is an extremely serious problem in Pakistan.[16] By applying proper medical waste management system, risks from these wastes can be decreased.[16] Despite this, concerned people are not aware of the gravity of situation.[10] In Pakistan, studies regarding hospital waste disposal practice have been done in a number of hospitals in different cities but local data regarding this practice in our district is not available.

This study was conducted to get first-hand information about hospital waste disposal practice in our local set up and draw recommendations in the light of our findings.

MATERIAL AND METHODS

It was a descriptive cross-sectional study carried out in Tertiary Care Hospital of Dera Ismail Khan from May 1, 2013 to December 7, 2013. Sampling method was convenient sampling technique. Prior written consent of hospital administrator and all sanitary workers was sought for study. Study instrument was a checklist filled by observations and interviews from administrator and all sanitary workers. Twenty-five units including 20 inpatient male/female wards (Surgery, Eye, ENT, Orthopaedic, Gynae& Obstetrics, Medicine, Paeds, Nephrorology,Urology, ICU) and 5 departments (Casualty, OPD, Operation theatre, Laboratory, Labour room) were selected for study. Our research variables were waste management plan, waste collection, waste segregation, checking reuse of disposable items, internal transport, protection of workers, infectious waste treatment, temporary waste storage, onsite disposal, offsite disposal. Variables were checked on the basis of attributes that need to be followed according to guidelines laid down by ministry of environment in consultation with ministry of health. Data was analyzed by descriptive statistical analysis plan and presented in percentages.

RESULTS

Plan for hospital waste management was absent. Hospital waste management team was not formed. Waste management officer was not designated. Written record of waste generation was not available. Waste audit is not done by any external agency. No training is ever organized for workers regarding proper hospital waste disposal and personal protection. Out of 25 units under survey, display of guidelines for health care waste management was absent in all units (0%), time table for frequency of waste collection was absent in all units (0%). Waste disposal points were indicated in 100% of units but 0% units displayed separate disposal points for risk and non-risk waste. Availability of different colour-coded containers for waste segregation is 0% in all units surveyed.In 100% units all waste was thrown whether risk or non risk in blue coloured container. Blue container was lined by plastic bag in 0% of units. Regarding reuse of disposable items, 30% units used needle cutter, punctured infusion bags and shredded plastic tubings. In 100% units expired or unused medicine were returned to pharmacy store. Two wheeled blue containers that were used for waste collection, also used for internal transport of waste in 100% of units. Containers fulfilled the criteria of dedicated trolleys for internal transport but 100% waste is unsegregated in these containers. 25 workers are doing the job of sanitation, none (0%) of sanitary workers were provided with protective gear. 15 out of 25 (6o%) of workers had incomplete vaccination course of tetanus toxoid and 6 out of 25 (24%) of workers had incomplete vaccination against hepatitis B. In 100% of units prior treatment

Table 1: Hospital waste disposal, administrative functions.

S. No.	Administrative functions	Yes /No
1.	Presence of hospital waste management team	No
2.	Presence of designated waste management officers	No
3.	Written record of waste generated available	No
4.	Waste audit done by the external agency	No
5.	Training program organized for concerned staff	No

Table 2: Overall review of segregation practice (n=25).

S. No.	Attributes of segregation	Yes	No
1.	Indication of separate disposal points for risk and non risk waste.	0	25
2.	Availability of different color coded contains for risk and non risk waste.	0	25
3.	Risk and non risk waste thrown in separate containers.	0	25
4.	Separate trolleys used for onsite transport of risk and non-risk waste	0	25

of infectious solid and liquid waste before disposal is not done. Human anatomical waste was returned to relatives for burial in 100% of O.Ts. No temporary central storage site for waste was available within hospital premises.Incinerator is installed but never functioned. Onsite disposal was done in large yellow open container outside but near the hospital gate. This was unprotected from unauthorized scavengers. All waste was dumped there unsegregated. Offsite disposal was done by municipal authorities on irregular basis. They finally dumped it unsegregated openly outside city.

DISCUSSION

Our study describes poor situation of hospital waste disposal practice as no plan of hospital waste management was present, waste management team was not formed,waste management officer was not designated, no record of waste generated was available. No training about proper hospital waste management practice is ever organized for concerned people. These findings are consistent with findings in a study in Colombo.[15] In a study by Khattak, 27% health facilities had plan for waste management. 30 % had teams for hospital waste management and 23% had regular training Program.[10]

In our study, segregation practice was 0%. Same is observed in studies done by Paudal et al and Kumar et al.[17,18] In our study 40% of units were using needle cutter coinciding with findings of Kumar et al study.[18]

In our study 100% units had 2 wheeled bin containers for internal transport but in study by Khattak 22% had 2 wheeled bin containers and 37% had dedicated trolleys.[10] In our study no worker was provided with protective gear. In a survey by Habibullah et al 67.9% workers were not provided with protective gear and in study by Rasheed 75% workers were not provided with protective gear.[5,19]

In our study no prior treatment of infectious solid or liquid waste was done before disposal and these results are consistent with results of study done by Rehman et al.[4] In a study by Rutla et al 80% waste is treated before disposal.[20] In our study no proper central storage area for waste was present. Same findings are of studies done by Kumar et al and Israel et al.[18,21] In our study, unsegregated waste was dumped on site, study by Gupta supports our finding.[22] Possible reasons for this poor practice can be lack of plan, lack of policy implementation, lack of monitoring and supervision by administration, lack of willingness among employees, lack of awareness about gravity of situation and proper waste disposal practices among concerned people, absence of financial mechanism for provision of supplies etc.

CONCLUSION

Hospital waste management practice is very poor in our study. Every aspect of this disposal practice needs a lot of attention and improvement.

It is recommended that every hospital should develop waste management plan following Pakistan Biosafety Rules 2005. Waste management team should be formed to supervise and monitor the implementation of plan. Responsibilities and duties of different category of staff involved from waste generation to segregation, handling, transport and storage to disposal be clearly defined. Financial mechanism be developed to buy containers, trolleys plastic bags, protective equipment and other requirements. Staff should be motivated and training should be organized for all concerned.Staff should be vaccinated against tetanus and hepatitis B.Emergency procedures should be developed in case of breakdown.

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CONFLICT OF INTEREST
Authors declare no conflict of interest.
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None declared.