ORIGINAL ARTICLE

Hospital Waste Management in Teaching Hospitals of Lahore System Assessment Using New Tool

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ABSTRACT

Aims: To assess Healthcare Waste management segregation at source, interim storage, transportation, main storage, disposal and safety of waste handlers in teaching hospitals of Lahore.
Study design: Descriptive cross-sectional.
Place and duration of study: Lahore; June 2012 - June 2013.
Methodology: This was descriptive cross- sectional study conducted in five teaching hospitals of Lahore; using convenient sampling technique. A new assessment tool was developed using WHO guidelines in collaboration with a system analyst from LUMS. Data was collected by visiting all five hospitals after due permission, observations and interviews of concerned personnel was the basis.
Results: Waste management team and plans were present in 4/5(80%) hospital. Segregation of waste at source, interim storage, internal transport, main storage were not up to recommendations of WHO and guidelines of Govt. of Pakistan. Protection of staff was not considered in 80%. Inconsistent supply of resources and poor basic infrastructure for HCWM was seen in 4/5 hospitals.
Conclusion: The new assessment method was quite helpful in detection of gaps in HCWM and advising appropriate corrective measure.HCWM needs urgent attention of all stakeholders: Govt., medical professionals, public in systematic way in order to protect people from deadly infections especially hepatitis B & C.
Keywords: Healthcare waste management, system assessment, World Health Organization.

INTRODUCTION

Hospital waste management is an ever growing hazard in developing countries like Pakistan. Its poor management has been associatedwith increased risk of spread of deadly infections like HCV, HBV and HIV[1]. The dangerous component of hospital waste is the infectious waste that makes about 10% of total waste generated in a healthcare facility.Total healthcare waste generated in most developing countries ranges from 0.5-3kg per person/ year[2], while in Pakistani healthcare facilities approximately 2kg/bed/day waste is generated; of which 0.1-0.5kg is infectious waste[3], total waste generation in Punjab is 0.65kg/ bed/day, Lahore has 44 hospitals, 500 clinics, (total bed strength 12480)[4]. Most contagious of hazardous hospital waste are sharps especially used syringes, infusion sets, scalpels, knives, broken glasses. Infectious waste includes dressings, clothes, used catheters, contaminated by blood and body fluids of patients, in addition, chemical, pharmacological and radiological waste is also associated with risks to the population[5]. 2.4 billion syringes are used in Pakistan every year. Pakistan has highest injection: patient ratio and highest rate of unnecessary injections in the world[6]. 30% population is using 10 injections/person/year. Main hazard is from re-use of syringes and use of substandard syringes, needle stick injury and recapping[7]. This is not simply attitudinal problem as people lack in knowledge of the risks of re-use and use of substandard syringes and risks of unnecessary injections[8]. Existing level of community knowledge about safety of injections is 10%[9].Infecting dose of Hepatitis B & C viruses can survive for up to one week in a droplet of blood in hypodermic needle of a syringe according to Japanese Association for Research in Medical Waste.Strong evidence of HBV, HCV and HIV infections transmission via improper hospital waste management especially through injuries caused by sharps (needles, scalpel etc.) is established[10, 11,] in addition about 1 million quacks are working in the country contributing to the use of unnecessary and unsafe injections in urban as well as rural areas[12]. The risk of transmission of serious infections further increases through mixing of infectious waste with the general waste, lack of segregation of general and infectious waste at the source, covered and safe interim storage areas, covered and safe transportation to main storage depot and then to final site of disposal[13, 14]. Improper HCWM is one of the important causes of failure to prevent and control hepatitis B & C in Pakistan

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especially hepatitis C is rapidly spreading disease reaching epidemic proportions.It has become indispensable to assess HCWM systematically identifying gaps in the system, their analysis and corrective measures must be taken. For this purpose Rapid assessment tool (WHO), survey Questionnaire for hospital waste management (WHO Regional Office SEA) are available[15]. As according to Blue Book of WHO on HCWM, even a limited survey will provide useful data on local waste generation and management than any estimate based on other countries data[16].We have devised a new assessment document to ensure systematic evaluation and consistency in reporting adverse events, working as a team, and enabling decision making timely to ensure patient and staff safety at all points of care[17].

The objective of the study was to assess Healthcare Waste Management (HCWM) segregation at source, interim storage, transportation, main storage, disposal and safety of waste handlers in teaching hospitals of Lahore.

METHODOLOGY

This descriptive cross-sectional study was conducted in Lahore from June 2012 to June 2013. Five teaching hospitals in Lahore were studiedafter due permission to concerned quarters. Sampling technique used was convenient sampling. Visiting all five hospitals, observations and interviews of concerned personnel was the basis. Outcomes of survey were noted and analyzed statistically using descriptive statistics.

A document was prepared taking in to account HCWM rules as devised by WHO and Govt. of Pakistan 2005 waste management rules[18]. A new assessment tool was developed using WHO guidelines in collaboration with a system analyst from LUMS Lahore.

RESULTS

Waste management team and plans were present in 4/5(80%) hospital. Segregation of waste at source, interim storage, internal transport, main storage were not up to recommendations of WHO and guidelines of Govt. of Pakistan. Protection of staff was not considered in 80%. Inconsistent supply of resources and poor basic infrastructure for HCWM was seen in 4/5 hospitals (table)

Category	150-bedded Teaching hospital	700 bedded Teaching hospital	Cancer Hospital	500-bedded Teaching hospital	200 bedded maternity Hospital	Assessment
WM-team	Nil	Present	Present	Present	Present	80%
WM-plan	_	Present	Present	Present	Present	80%
Segregation of waste at site	Patchy	Good in some, casual in others	Best	Casual	Patchy	20%
Color coded containers	_	Present	Present	Partial	Partial	40%
Internal transport	Use of wheel chair	One trolley, unsafe	Adequate ,covered,	Wheel chairs	Unsafe	20%
Main storage	Filthy	Improper maintenance	Adequate Clean	Insecure	Improved now	40%
Transport to final destination	Unsupervisioned , vehicles to outside	Vehicles to outside	Incinerator inside	Dumping	By vehicle outside	20%
Use of protective gears	_	_	Adequate	_	Partial	20%
Immunization of workers	None	Partial	Adequate	None	Partial	20%
Accident/spillage management	None	None	Adequate	None	None	20%

DISCUSSION

Healthcare waste management (HCWM) was according to standards as devised by Govt. of Pakistan and WHO in one of five hospitals, from documentation to implementation of rules & regulations with consistency and devotion by well trained and motivated staff.Conditions were worse in district level teaching hospital, with the exception of some cosmetic measures. Although formation of HWM team, and plan was present formally in other institutions (80%), the implementation of rules

regarding color coding, segregation at source, containerization; was partial and especially at night time. The interim storage of waste, its transportation was unsafe, wheel chairs were at times used for transportation of infectious waste. The risk of spillage was high and there were no protocols to deal with such scenarios in all the 4/5 hospitals. The main storage room was small enough and filthy in 2/5(40%), non-existent in one, adequate and well maintained in 1/5(20%) institutions.Protection of waste handlers, transporters was not observed meticulously in 3/5(60%) institutions. Immunization was not mandatory for them, provision of protective gadgets (heavy duty gloves, long shoes, masks) were only provided in 1/5(20%) institutions.Incinerator was present only in one hospital for final disposal. Transportation for final disposal was not supervised and properly recorded.The situation is worse in peripheral areas and in small cities[19].No audit system was present for assessment of efficiency of HCWM system. Proper record maintenance was not done in 4/5 hospitals.Since use of contaminated needles in medical care[12], lack of responsibility sharing by medical community to educate people regarding the risks of unnecessary injections, malpractices, and quackery are rife; therefore the efforts for implementation of proper HCWM in Pakistan demand joint efforts by the Govt., political hierarchy, civil society, medical community, and public, a systematic way to tackle this huge challenge by gaining everyone's commitment and involvement[11].

CONCLUSIONS

New assessment method was quite effective in overall assessment and indicating gaps in the system and need for its remedy.

1. Provision of adequate budgets for HCWM to ensure consistent supply of resources.
2. Regular training workshops for medical, paramedical staff,
3. Active Involvement of all those responsible for HCWM according to rules.
4. Efficient record keeping and regular assessment and audit of HCWM
5. Education and training of public through media

REFERENCES

1. WHO: Hepatitis C Spread: in: Bulletin of WHO 1999, 77(10), page 790.
2. UNEP: Developing Integrated Solid Waste Management Plan (Training Manuel) vol. 2 Assessment of Current Waste Management System and Gaps therein; 2009.
3. Shahida Rasheed, Saira Iqbal, Lubna A Bag, Kehkashan Mufti: Hospital Waste Management in Teaching Hospitals of Karachi in JPMA 55:192, 2005
4. Draft Final Report: Punjab Solid Waste Management Reforms, The World Bank PPIAF : page 111-116, Aug. 2007
5. WHO: Safe Management of Wastes from Healthcare Activities :Editors:YvesChartier, et al; second edition. Page 4, 2014.
6. S A Mujeeb: unsafe injections----a potential source of HCV spread in Pakistan; Blood Transfusion Services, JPMC.
7. Zulfiqar A Gorar, Zahid A Butt, Imrana Aziz: Risk factors for blood born viral hepatitis in Healthcare Workers of Pakistan: a population based study; BMJ Open 2014; 14: e004767doc:10.1136/bmj open-2013004767.
8. Hussain M, Mushtaq MM: Awareness about Hospital waste and its effect on health of patients in District DG Khan; Asian Journal of Applied Science and Engineering, 2014, 3, 41-48.
9. Prime minister's Program for Hepatitis Prevention & Control
10. Improper Hospital Waste disposal favors transmission of viral infection(JPMA jun. 2013, BMC Addisababa 2011)
11. WHO: unsafe injections in the developing world: a review, in : Bulletin of WHO 1999, 77(10), page 791-795.
12. Furqan Ahmad: Global Perspectives on Hepatitis C: The View from Pakistan; BMJ 339:doi:10.1136/bmj.b4431, Oct 2009
13. Qadir S, Akhtar MN, Hassan M, Ahmad I, Naeem H, Rehman O. study of Hospital Waste Disposal Practice in a Tertiary care Hospital; Gomal J Med Sci 2014:12:64-67.
14. Health Services Academy Nationwide Survey on Healthcare Waste Management.
15. WHO: HEALTHCARE Waste management, Rapid Assessment Tool; available at: apps.who.int/medicinedocs/…../s15244c.pdf.
16. Yves Chartier et al WHO : Safe management of Wastes from Healthcare activities, second edition, 2014.
17. Madelyn P. Law, Rosanne Zimmerman, G. Rossbaker, Teresa Smith: Assessment of safety culture maturity in a hospital setting; Healthcare Quarterly vol 13, special issue sept. 2010 pp 110-114.
18. Hospital Waste Management Rules, 2005-Pak-EPA: available at: environment.gov.pk/act-rules/rHWMRules2005.PDF
19. Hussain M, Mushtaq MM: Awareness about Hospital Wastes and its effects on the Health of Patients in District Dera Ghazi Khan; Asian Journal of Applied Sciences & Engineering, 2014, pp: 46-48.