



Hospital wastes management at different Government and Private hospitals of Quetta city in Balochistan, Pakistan

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Abstract

Hospital waste is hazardous, infectious for human and the environment. So hospitals properly manage and dispose of their waste. This aim of this current study was to the disposals, collections and proper management of hospital wastes in Quetta, city Pakistan. Cross sectional and descriptive survey on four different government and private hospitals of Quetta were conducted for waste management practices. Questionnaire was used for the general information of the hospital staff, nurses, medical students and sanitary workers. Results show that hospital waste management segregation process was same in all government and private hospitals. Children Hospital Quetta adopted better methods of waste management like waste collection, handling dangerous waste, transportation. Private hospitals used better waste management techniques then as compare to government hospitals. However an estimated daily 2-3 tone waste was generated as clinical waste and dumped in incinerator installed at Bolan Medical College.

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Introduction

Healthcare waste management is a serious health issue in many developing countries and nearby population is exposed to health hazards due to poor management of hospital wastes. (Hossain *et al.*, 2011). Hospital waste management is an important issue of environmental pollution and the management of harmful waste requires exact knowledge, regulations and must be trained workers and specialists for waste management. According to the World Health Organization (WHO) the improper waste management of health care can direct effect on the community and human health care facilities and environment (Guddu *et al.*, 2007).

The poisonous waste produced by hospitals worldwide contains used bandages, syringes, blood bags, intravenous drip bottles, biomedical waste such as body part and medical tools. Sharp purposes are the top rates of causing injuries to hospital staff and spread of serious infections (Akhter, 2000). Researches in Pakistan illustrate that around 2.0 kg of waste/bed/day is generated out of which 0.1- 0.5 can be considered as risk waste (Hashmi and Shahab, 2003).

Hospital waste creates health problems like serious health infections and injuries. Hospital wastes are two types risk and non-risk wastes (Blenkharn, 2006). Medical waste can hypothetically use again without disinfection. Again and again use of unsterilized waste material causes a high percentage of the diseases that grow due to poor waste management (Kumar *et al.*, 2010).

Hospital waste is a like-product of health care that contains blood, body parts, sharps, non- sharps, chemicals, pharmaceuticals, medical procedures and radioactive tools (Kalia *et al.*, 2014). Private hospitals and personal clinics should make their own rules and processes for waste handling in agreement to their requirements (Manan, 2015).

Hospital waste management practices in Bahawalpur government hospitals were segregated 50% medical waste while private hospitals were only 16.6%. Government hospitals segregated in separate areas.

Disposal of waste was not proper in all government and private hospitals of Bahawalpur and there are no incinerators. They dispose all waste in different areas of hospitals (Badar *et al.*, 2014).

Hospital waste generated in the course of health care events during treating, diagnosing, and protecting human being or while doing research activities included 75-90% non-hazardous/general waste and 10-15% hazardous waste. However, developing countries waste mostly dumped empty plots and road sides. Although, untreated waste is hazardous for environment and near living peoples (Arshad *et al.*, 2011).

Hospital waste includes hazardous or harmless waste. The different types of harmful wastes are infectious waste, pathological waste, sharps, pharmaceutical waste, genotoxic waste, chemical waste and radioactive waste (Rasheed *et al.*, 2005).

Pakistan lack proper waste management technique which requires incineration, autoclaving and killing of pathogens by steams which are being practiced in all of the developed countries. Government hospital has no setup for the waste management so the hazardous waste spread in the cities. Afghanistan, China, Bangladesh, Iran and India all countries use incineration technique for waste management (Akter, 2000).

The aim of the current study is to the disposal and removal of hospital waste management as hygienically and economically as possible and by methods such as that the risk to health and environment. Storage, packing, transport and healthcare practice of handling waste products of Quetta hospitals

Materials and methods

Study design

This cross sectional design descriptive study was conducted in four different private and government hospitals of Quetta, Civil hospital Quetta , Bolan Medical Complex, Quetta, Saleem complex, Quetta and Children hospital of Quetta between 25th July 2015 to 13th August, 2016.

Data collection

There are 71 hospitals in Quetta but we were selected randomly four hospitals for this current study. Qualitative research method was used in this current study by developed a questionnaire for the collection of genuine and reliable data about hospital waste management. A random sampling method was used to select the defendants from the hospitals and discarding areas.

To gather the information concerning hospital waste management performs within the hospitals of Quetta city, 40 interviews (5 Interviews in each hospital) were conducted.

Questionnaires based survey

Questionnaires based survey was conducted among hospital management include doctors and other administrative staff members for both primary and secondary data.

Primary data was based on questionnaire and pattern of question was adopted as described by Arshad *et al.*, (2011). Secondary data was based on comparison of our finding with already available research materials.

Assessment of hospital waste

Procedures of storing and separation at ward, internal transport, and external transport and on site final disposal were studied for all 4 hospitals.

Results

Questionnaires based interview

Staff members included nurses, ward servant; laboratory assistant and sanitary workers were interviewed during current research (Table 1).

Treatment of hospital waste

Segregation of waste disposal requires damping, disposing and treatment in categories practices in Quetta city. Hospitals use waste boxes of different colors. Blue boxes contained high rate of contamination with 55% and yellow boxes contained 12% with least production of wastes (Table 2).

Colored baskets were also installed for waste collection purpose and during processing all wastes are mixed in a single container. Non-infectious wastes were not practicing and used for recycling purpose (Fig. 2).

Table 1. Detail of government and private hospitals staff members interview.

Hospitals	In charge of HWM*	Nurses	Medical student	Admin staff	Ward servant	Laboratory Assistant	Sanitary worker	Total
Government	2	3	1	2	4	2	1	15
Private	2	1	0	2	3	1	0	9
Total	4	4	1	4	7	3	1	24

* HWM (Hospital waste management).

Table 2. Segregation of hospital waste disposal in hospitals.

Color of waste boxes	Waste Material	Treatment Option*	Percentage Production
Yellow	Human body parts, Micro biological waste, and soiled cotton, dressings.	Incarnation	12%
Red	Tubings, catheters, lv sets.	Shredding after autoclave	8%
Blue	Waste sharps (needles, syringes, Scalpels, gloves and plastic wastes).	Autoclaving and destruction	55%
White	Needles and cut glasses.	Autoclaving and destruction	20%
Black	Discarded medicines, incineration ash and general waste.	Autoclaving and destruction	5%

*Facilitates are already available at selected research areas.

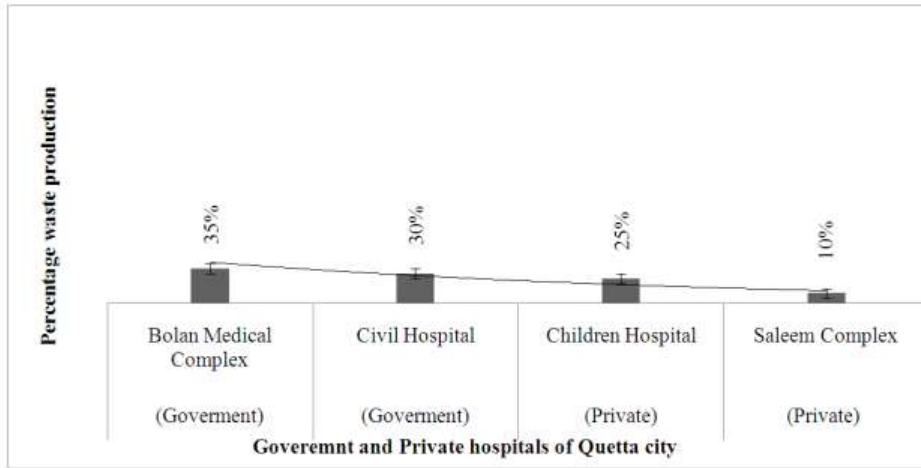


Fig. 1. Comparative analysis of monthly waste production in Government and Private hospitals.

Waste segregation

Waste segregation problem progressively increased in Quetta city due to lack of unawareness rules of health waste management in-charge and other staffs. Per month waste production was found highest (35%) in Bolan Medical complex and least (10%) was observed in Saleem complex hospitals respectively. Only one working incinerator is installed in Bolan Medical complex available for all other hospitals of this city (Fig. 3).

Management of hospital waste

Management of hazardous waste on small scales some methods are used such as disposed on hospital sites, sanitary landfill and discharge to sewer (Table 3). Different methods being used in medical waste treatment some waste disposed on hospital premises and some sites there where waste is isolated because they are safe for environment. It is well thought out when it has totally despoiled biologically, chemically, and physically. But mostly areas are waste discharge to sewer.



Fig. 2. Various waste color waste bin placed at Saleem Complex Quetta.



Fig. 3. Incinerator installed at Bolan Medical Complex.

Table 3. Medical waste treatment applying effective disposal methods.

Methods/waste	Infectious	Anatomical	Pharmaceutical	Chemicals	Radioactive
Disposed on hospital premises	Yes	Yes	S	S	No
Sanitary landfill	Yes	No	S	No	No
Discharge to sewer	No	No	S	No	L

Yes: facility available, No: facility not available, S: available in small quantities, L: waste at low level.

Discussion

Al-Sayyid (1993) reported that the solid waste management holds waste recovery (at the source, through final disposal) and public education to inspire the population to develop attitudes and

practices, which are subtle to waste issues such as source separation or waste minimization. Waste recovery denotes the deletion of waste for some type of reuse, recycling or composting. Adsavakulchai (2002) carried out a survey review medical waste management in Phitsanulok province, Thailand in order to improve waste management. The study was to classify the characteristics of waste and generate the implementation structures at hospital. The research was lead to find the average daily waste produced from hospital and clinics. Frequent factors such as type of hospital, specialism, quantity of refillable items, and waste management plan were examined in waste generation valuation. In Pakistan, around 20% of the hospital waste is observed as potentially dangerous or infectious whereas in case of India this range varies among 15-35%. This change depends on the overall amount of waste which is produced within the country (Akter 2000).

Askarian *et al.*, (2004) reported that hospital waste is measured dangerous because it may own pathogenic agents and can origin unwanted possessions on human health and the environment. Survey was carried out in all 15 private hospitals of Fars province (Iran) from the total numbers of 50 governmental and private hospitals situated in this province, in order to control the amount of dissimilar kinds of surplus produced and the present state of waste management. Separation of the different types of waste is not approved out flawlessly. Two (13.3%) of the hospitals use ampules deprived of lids for on-site transport of wastes. Nine (60%) of the hospitals are set with a heater and six of them (40%) have working difficulties with the incinerators.

In all hospitals community workers transport waste outside the hospital buildings daily or at the most on another days. In the hospitals under study, there aren't any training courses about hospital waste management and the threats associated with them. In this current study we observed that both main government hospitals of Quetta city although producing more hospital waste besides, but follow proper segregation

and infection control rules and trainings of the wastes generated on daily basis. Besides, in private hospitals municipal waste with hospital waste together from each facility was dumped in open areas due to lack of incinerator facility.

Colored waste bin were only installed at Saleem complex hospital and other hospitals single dust bin are used for collection of wastes. Anwar-ul-Haque, (2006) observation was similar to those of our finding such very few hospitals have proper waste collection bins for disposal of waste. It's due to lack of awareness and proper training of waste handlers. Government and private hospitals no proper waste collecting bins. Trolleys and color coded bags have no value for waste transportation in both private and government hospitals. Our reports in private hospitals are similar with the study conducted by (Khandelwal *et al.*, 2013) which shown that majority of hospitals was not liability color coding for bins.

Infectious hospital wastes are daily dumped in open areas causing rapid decline for the land available for agriculture. Only one working incinerator at Bolan medical complex is available for 3.5 million people which are not sufficient to cover entire population of this city. These results compare with the study conducted by Rasheed *et al.*, (2005).

Our results are reviled that survey from hospitals conducted suggested that majority of hospital staff members were not fully aware about the hospital waste management practices. Medical staff members show negligence about segregation, disposal of hospital waste more common in developing countries (Hossain. 2011).

Mismanagement of hospital waste is indirect source of environmental pollution. Most importantly during this research 55% waste material was reported as waste sharps such as needles and syringes, without autoclaving and proper destruction an increase in Hepatitis and Aids like lethal diseases can rapidly be increase in this city. Besides, the least waste 5% include discard medicine but these can alter the composition of underground water and increase the chances of few silent health hazard issues (Hossain, 2011).

Conclusion

The overall findings of this study indicate the clinical waste prevent disease transmission from waste products. Majority of government and private hospitals were transport biological waste and infectious waste to incinerator. Elastic waste products are sold which would be recycled and taking profits shortly they don't care patient condition. It is due to lack of knowledge about the practices of waste segregation, collection, selling, dumping. Children hospital waste practices are better than others. This study shows that correct waste management policy is need to confirm health and environmental safety and private hospital waste managing has better than in comparison of government hospitals.

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