

# A Comparative Study of Hospital Waste Management in Eight Hospitals with Respect to Rules 2005

M.IJAZ NASIR,<sup>1</sup> ASIF HANIF,<sup>2</sup> USMAN JAVED IQBAL,<sup>3</sup> TAHIRA ASHRAF<sup>4</sup>

<sup>1</sup>Head Chest Unit, Gulab Devi Chest Hospital Lahore. <sup>2</sup>Assistant Prof. and HOD Biostatistics Gulab Devi PGMI – Lahore. <sup>3</sup>Demonstrator Gulab Devi PGMI, M.phil Public Health\*. <sup>4</sup>Assistant Director: Statistical consultancy and Training center.

Corresponding author: Dr. M. Ijaz Nasir: pakheim@yahoo.com

## ABSTRACT

**Background:** Hospital waste management is an important issue when taken in relevance of overall environmental and public health. In Pakistan, not much attention has yet been focused to assessment of waste management in public or private sector hospitals. Hence we aimed to focus on this problem.

**Objective:** Evaluation of existing waste management situation in public and private health sectors

**Methodology:** This was a cross sectional study conducted in eight public and private hospitals of Lahore. A pre-defined comprehensive questionnaire was made on basis of literature regarding hospitals waste management. The data was entered and analyzed using SPSS 18.0. Detailed descriptive results in form of percentages and ratios were presented.

**Results:** Out of total eight hospitals 6 (75%) hospitals had written hospital waste management plan and 6 (75%) had waste management team. Seven (87.5%) were aware of hospital waste associated risks, 6 (75%) had devised training program. Post exposure procedure after injury was available to 37.5% of the hospitals only, routine surveillance for staff was present in 62.5% hospitals, reporting system on accidents of HMW was present in only 25% (2 of 8). HW weighing was available in 50% (4 of 8) hospitals. Segregation was available in all 8 (100%) hospitals. Hospital waste was disposed of (whether treated or not treated) in pits in 12.5% (1 Of 8) hospital, in municipal dumping sites in 50% hospitals and burned in 3 hospitals (37.5%).

**Conclusion:** Provision of training, reporting of accident injuries, post exposure procedure for injured staff, improvement in collection, transport, storage and safe disposal of waste are deficient areas and need to be improved in all hospitals.

**Keywords:** Environmental pollution, Public health, Hepatitis, AIDS, Disposal, Incineration.

## INTRODUCTION

Hospital waste management is an important issue when taken in relevance of overall environmental and health management.<sup>1</sup> Despite of the fact that laws for biochemical waste management in hospitals have been devised, the actual situation is still very unsatisfactory.<sup>2</sup> The basic reason for this substandard condition of waste management lies in lack of implementation of these laws. Also, deficient interest of hospital authorities in appropriate management of waste is also another main reason. Additionally, no proper check and balance for collection, management and disposal of waste is kept. This problem is particularly evident in developing countries.<sup>3</sup> The rapid urbanization in these countries, particularly Asian countries, on one hand has provided the opportunity to people for quicker access to better healthcare services that further has resulted in

improved health outcomes. On other hand however, the problem of improper waste management has also risen with further rise to associated health and environmental hazards.<sup>4</sup> On top of that, the casual attitude of staff regarding proper disposal of waste has aggravated the problem of appropriate management of this biochemical waste. A usual trend around the globe generally, and in developing countries specifically is that attitude of staff towards management of waste is of low point unless they are well aware of the importance of waste management.<sup>5</sup>

With the advent of technological advancements, most of the hospitals have started using new methods for management of infectious and non-infectious waste. Internationally, non-incineration techniques are now being used realizing the hazard of toxic emissions from incineration.<sup>6</sup> In some countries even the use of incineration has been banned for these associated

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risks.<sup>2</sup> The situation, though better, is yet not perfect in developed countries as well.<sup>7</sup> In UK, a second audit following previously done audit one year back was performed for 16 UK hospitals in 2006. The study revealed many deficiencies in overall performance on management of waste. It was concluded in the study that a poor performance in hygiene, housekeeping and safety was observed in majority of the hospitals. The storage place of waste was in very much contact of public, individual carts were lacking locks and segregation was very poor too.<sup>8</sup> It is thus quite evident that negligence of law for appropriate waste management is also observed in most of the European countries. A similar evaluation was done in two hospitals of Limpopo province of South Africa in 2007. A major implementation gap was observed between the national policies and hospital practices. Additionally, open incineration and landfills were observed to be operated that caused serious health outcomes. The technology being used was not environmental friendly and the average weight of waste was beyond the maximum standards. Overall, unsatisfactory waste management performance was observed in this case study.<sup>9</sup>

In Pakistan, not much attention has yet been focused to assess waste management in public or private sector hospitals. One study in Karachi showed that poor waste disposal is being practiced in most of the hospitals. Also special emphasis was given to training and awareness of staff about the entire waste management strategy.<sup>10</sup> Small hospitals or the community hospitals are mainly exposed to improper waste management system.<sup>11</sup> Considering the fact that small or community hospitals contribute a lot in health care facilities, it is imperative to start the appropriate management if waste from these places.<sup>12</sup> Proper segregation<sup>13</sup>, a defined committee for waste management<sup>14</sup>, repetitive audit, adoption of latest technology for appropriate landfill and incineration<sup>15</sup> are some of the steps to be taken on immediate basis for proper waste management.

Despite of the fact that laws for biochemical waste management in hospitals have been devised, the actual situation is still very unsatisfactory. The basic reason for this substandard condition of waste management is due to lack of implementation of these laws. Also, deficient interest of hospital authorities in appropriate management of waste is also another main reason. Additionally, no proper check and

balance for collection, management and disposal of waste is kept. So this study will help to assess the understanding and approach to waste management in health care system of Lahore.

## MATERIALS AND METHODS

**Design & Setting:** This was a cross sectional study conducted in eight public and private hospitals of Lahore. These hospitals included Gulab Devi Hospital Lahore, Children Hospital Lahore, Jinnah Hospital Lahore, Darbar Hospital Lahore, Gulab Devi Hospital Kasur, Iqbal Mehmooda Hospital Raiwind Road, Usman Hospital Lahore and Ittefaq Hospital Lahore.

**Data collection & Methods:** A broad search strategy was used to identify literatures on HWM and to define key parameters to be assessed in current study. Correspondence with colleagues within the Health Protection Agency, who have special interest in this area of study, was also made to identify common factors of waste management in our setting. A pre-defined comprehensive questionnaire was made on basis of literature regarding hospitals waste management. The primary goal of this questionnaire was to carry out situation analysis and document the approach to waste management in health care system in and around Lahore.

**Data Analysis:** The data was entered and analyzed using SPSS 18. Detailed descriptive results in form of percentages and ratios were presented.

## RESULTS

Out of total eight hospitals, six hospitals (75%) had written hospital waste management plan and six (75 %) had Waste Management Team. Seven hospitals (87.5%) were aware of hospital waste associated risks, six (75%) had devised training program. Post exposure procedure after injury was available in 37.5% of the hospitals, routine surveillance for staff was present in 62.5% hospitals, reporting system on accidents of hospital waste management was present in only 25% (2 of 8) and HW weighing was available in 50% (4of 8) hospitals.

Segregation was available in all 8 (100%) hospitals. Whereas 50% (4 of 8) hospitals had temporary, 37.5% (3 of 8) hospitals had central and 1 (12.5%) hospital had both temporary as well as central storage areas. Separate hazardous and general hospital waste storage areas ratio was 4:3:1.

<b>TABLE.1-HOSPITAL WASTE MANAGEMENT DIRECTORY</b>		
	<b>n = 8</b>	<b>Percentage</b>
Waste management plan	6	75%
Waste management team	6	75%
Awareness of waste related risks	7	87.5%
Waste management training programs	4	50%
Routine surveillance for staff	5	62.5%
Post exposure procedure facility	3	37.8%
Reporting system on accidents of HWM	2	25%

For on-site transport carts, trolleys and two wheel bin containers were available in ratio of 1:6:1, hospital waste bags were transported outside the hospital establishment (i.e. Off-site transportation) in 37.5% (3 of 8) hospitals on dedicated vehicles and in 62.5% (5 of 8) hospitals on municipality vehicles. On-site treatment facility was available as per follows: None 62.5% (5 of 8), Open Fire 25% (2 Of 8) and Incineration 12.5% (1

of 8) hospital waste was disposed of (whether treated or not treated) in pits in 12.5% (1 Of 8) hospital , in municipal dumping sites in 50% (4) hospitals and burned in 3 hospitals (37.5%). Record keeping was available in 6 hospitals (75%) and water was led to the sewerage system through open water source in all 8 hospitals (100%) and none had waste water treatment plant.

<b>TABLE.2-STRATEGIES FOR HOSPITAL WASTE MANAGEMENT</b>		
	<b>n = 8</b>	<b>Percentage</b>
Segregation	8	100%
Storage (Temporary &/or Central)	1	12.5%
Transportation on municipality vehicles	5	62.5%
Open fire treatment	2	25%
Incineration	1	12.5%
Disposal in pits	1	12.5%
Disposal in municipal dumping sites	4	50%
Burned	3	37.5%

## DISCUSSION

It is crucial to understand the importance of appropriate waste management in healthcare institutes, as hazardous biochemical waste can pose serious impacts to health and environment.<sup>16</sup> Not only grass root changes as implementation of laws and opting for latest safe management tools are necessary, but a widespread awareness regarding proper waste disposal is also essential.<sup>11</sup> Our study aimed to assess the existing waste management situation in public hospitals and private health sectors. Eight public and private hospitals were selected in the study out of which 6

(75%) hospitals had written hospital waste management plan and 6 (75 %) had waste management team. Seven (87.5%) were aware of hospital waste associated risks, 6 (75%) had devised training program. Another study conducted in Germany in 2009 specially emphasized on need of devising waste management plans with qualified staff and conduct regular trainings for keep them updated.<sup>17</sup>

Furthermore, in our study segregation was available in all 8 (100%) hospitals. Whereas 50%(4 of 8) hospitals had temporary, 37.5% (3 of 8) hospitals had central and 1(12.5%) hospital had both temporary as well as central storage areas.

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Many other international studies have shown that most of the management systems have poor segregation and even the perception of staff about proper segregation is casual. A study conducted in Ghana in 2011 showed that the storage system and disposal of waste was hazardously open in more than 75% hospitals under study. Almost same was the proportion for poor landfills or dumping.<sup>18</sup>

In our study on-site treatment facility was available as per follows: None 62.5% (5 of 8), Open Fire 25% (2 Of 8) and Incineration 12.5% (1 of 8), hospital waste was disposed of (whether treated or not treated) in pits in 12.5% (1 Of 8) hospital, in municipal dumping sites in 50% (4) hospitals and burned in 3 hospitals (37.5%). One study in Tanzanian hospitals showed that in 50% hospitals pit burning and in 30% hospitals burying was performed. In 71% hospitals the mode of transport of waste was dustbin without plastic bags even. And poor incineration with fire bricks was being used.

Most of the hospitals worldwide prefer on-site disposal compared to off-site waste disposal. In our study, for on-site transport carts, trolleys and two wheel bin containers were available in ratio of 1:6:1, hospital waste bags were transported outside the hospital establishment (i.e. Off-site transportation) in 37.5% (3 of 8) hospitals on dedicated vehicles and in 62.5% (5 of 8) hospitals on municipality vehicles. In Portugal, a study was conducted in on-site disposal hospitals and found that waste separation and transport was deficient whilst the transport for waste was open providing daily public contact to patients.<sup>1</sup> Additionally, another study in Iran also concluded almost same result and blamed poor separation, lack of proper temporary waste places and hazardous on-site waste disposal to be major problems in waste management system.<sup>19</sup>

Hence proper awareness about complete system of hospital waste management and hygiene, hiring of qualified staff, proper segregation and disposal are suggested on immediate grounds. Further research to gain in depth knowledge is also recommended.

## CONCLUSION

Overall, there is a low understanding of hospital waste management that endorses need to create awareness among authorities and concerned staff. Provision of training, reporting of accident injuries, post exposure procedure for injured staff,

improvement in collection, transport, storage and safe disposal of waste are some areas of special concern and need to be improved in all hospitals.

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