Hospitals & Waste: A Pilot Study of Waste Generated By a Premier Hospital in India

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***Abstract*—Background:** The field of medicine has improved by leaps & bounds. More & more critical patients are being treated by ever increasing number of hospitals. The need for sterility & infection control has lead to increased use of disposable consumables. Substantial waste generated is infectious and is a potential risk factor to the society if not properly disposed. This study was done with an aim to find waste generated by a premier public hospital in North India catering to a huge catchment area. **Methods:** All health care setups in India have to follow provisions of Biomedical Waste Handling Rules enacted in 1999. Every hospital has to submit an annual report detailing waste generated and its disposal. Annual reports submitted by the study hospital were used for data collection. **Results:** 498 tons of biomedical waste was generated in the hospital per year or 1.3 tons/day during 5 year study period. 56 % of this waste was incinerated. Infective waste generated was 0.4 kg/bed/day which is in accordance with findings of other hospitals. No significant correlation was seen between incinerable & non incinerable waste generated during the study period [r= - 0.616, n= 5, p= 0.269]. **Conclusion:** Hospital wastes are increasing day by day. Ways need to be developed to reduce waste without compromising on sterility and infection control. More environment friendly methods of disposal vis-à-vis incineration need to be developed to handle huge amounts of infectious waste.

***Keywords*—** Hospitals, waste, disposal.

I. Introduction

With increasing awareness and quality practices of medicine and safety precautions the generation of hospital waste is also increasing. More and more critical care patients are being treated by ever increasing number of hospitals. The need for sterility & infection control has lead to increased use of disposable consumables. Substantial waste generated is infectious and is a potential risk factor to the society if not properly disposed. With increasing usage of disposable materials there is a huge increase in waste generation in the form of plastic which is hazardous to environment. Along with increase in the /quantity of waste it also increases the risk. Numerous laws have been enacted to ensure proper disposal of biomedical waste. Bio-medical waste has a potential for infection and injury to healthcare worker, patient and the surrounding community. Incineration is the usual method followed for disposal of infectious biomedical waste. But incineration has its own disadvantages in the form of environmental pollution. Awareness program on proper handling and management of biomedical waste to healthcare workers reduce the quantity of infectious waste produced & can prevent the spread of infectious diseases and epidemics.[1] Recording system like waste management registers can also help but a study conducted in a group of hospitals found no such system.[2] This study was done with an aim to find waste generated by a premier public hospital in North India catering to a huge catchment area.

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II. Methods

All health care setups in India have to follow provisions of Biomedical Waste Handling Rules enacted in 1999. Every hospital has to submit an annual report detailing waste generated and its disposal. This study was conducted at Post Graduate Institute of Medical Education & Research which is a 2000 bedded tertiary care teaching hospital in North India. Annual reports submitted by the study hospital for the 5 year period from 2010 to 2014 were used for data collection. The data was entered and sorted in Microsoft Excel 2007. Correlation was used as a test of significance to find the relationship between quantities of incinerable & non incinerable waste. Statistical tests were performed at a significance level of $\alpha = 0.05$ using SPSS for Windows (version 17.0; SPSS Inc., Chicago, IL, USA).

III. Results

The hospital generated 2490039 kgs of waste during the 5 year period from 2010 to 2014 at an average of 1364.4 kg per day and 498007.8 kgs per year. That translates into 0.71 kgs of waste per bed per day. The results showed an increasing trend of biomedical waste generated in the hospital during the 5 year study period [Fig.1]. The non incinerable waste decreased during the period while the incinerable waste increased [Fig 1]. The proportion of incinerable waste increased steadily from 49% to 61% of total waste. A negative correlation was seen between incinerable & non incinerable waste generated during the study period [r= - 0.616, n= 5, p= 0.269].

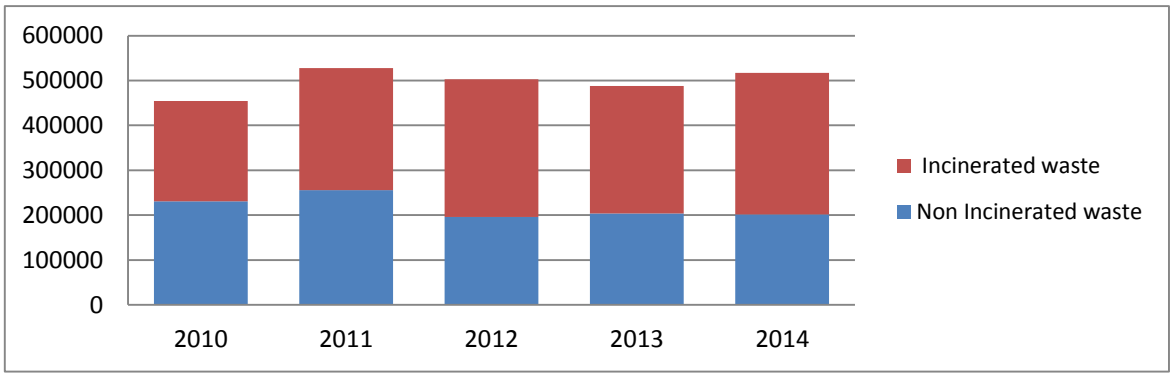

Fig 1. Biomedical waste generated by the hospital from 2010 to 2014

IV. Discussion

This study clearly showed increasing trend of biomedical waste generated. This corresponds with the findings of several such studies. [3] A similar study showed mean annual hazardous waste production per dialysis session increased by 14% during the study period: 0.640 kg per session in 2008 vs. 0.740 kg in 2012.[4]

Sterility and infection control concerns have lead to universal adoption of disposable materials. This has made recycling and waste reduction difficult for hospitals. It has been suggested that enhancing education and promoting communication between medical units and recycling industries must be implemented to prevent recyclable waste from entering the incinerator.[5] Many groups have reported the adsorption or retention of (99m) Tc-radio pharmaceuticals on injection vials and disposable plastic syringes. Such high radioactivity would result in radiation exposure, waste, and economic burdens .[6][7]

Industries and hospitals have to coordinate & come out with better disposal methods. Intensive and critical care medicine has increased tremendously & will keep increasing but these are also a huge source of waste. [8]The challenge before the world Is to ensure that hospitals which are institutions for curing pain themselves do not become source of pain for the society.

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About Author (s): The challenge before the world Is to ensure that hospitals which are institutions for curing pain themselves do not become source of pain for the society