Dissertation TD

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Submission date: 08-Jun-2021 11:22AM (UTC+0530)
Submission ID: 1602666971
File name: Disertation_-_Copy.docx (35.9K)
Word count: 2580
Character count: 16101

Biomedical Waste Management knowledge & practices among Tertiary care Hospitals in Delhi.

Introduction

Health care waste might be a unique category of waste by the standard of its composition, source of generation, its hazardous nature and hence the requirement for suitable precautions during dealing with, treatment and disposal. Mishandle of the waste influences the generators, administrators yet in addition persons as well. 'Bio-medical waste' (BMW) implies any solid and liquid fluid waste including its container and any intermediate product, which is created during the diagnosis, treatment or vaccination of people or animals or in research relating thereto or within the production or testing thereof. Due to the rise within the strategies that are completed at the varied medical services arrangements, excessive amounts of waste are generated at the centers of care. India approximately creates 2kg/bed/day and this biomedical waste incorporates wastes like anatomical waste, cytotoxic waste, sharps, which when inadequately segregated could cause various kinds of deadly infectious disease like Human immunodeficiency virus(HIV), hepatitis C and B diseases, and so on , and furthermore cause disturbances inside the climate, and unfavorable effect on environmental equilibrium. Adequate information amongst the medical care representatives about the biomedical waste administration rules and guidelines, and their understanding of segregation, will help within the competent removal of the waste in their respective organizations. Acceptable administration of biomedical waste management starts from the underlying phase of generation of waste, segregation at the source, storage at the vicinity, sterilization, and move to the terminal disposal site plays a basic part

within the removal of waste Henceforth adequate information, attitudes and practices of the staff of the health care services plays a truly significant part. Studies recorded from various parts of the nation; actually pass on that there are gaps within the Knowledge, lacunae within the attitudinal part and inconsistency within the practice aspects which are matters of concern among the health care services experts.

There are a few guidelines for waste segregation. Waste are classified and segregated in a several color coded bags like Red, Yellow, Blue, White and Black. There is various treatment options for treating waste gathered in a several containers. For example waste gathered in yellow bag are either treated by Incineration or deep burial, waste gathered in red bag are either treated via Autoclaving and microwaving or using chemical treatment, waste formed in blue and white bag are treated via Autoclaving, shredding and chemical treatment and finally waste collected in black bag are disposed in landfill.

Many hospitals don't go with biomedical waste management act (1998) and revised guidelines for common biomedical waste treatment facilities (2016).

The aim of this study is to assess and analyze the prevailing biomedical waste management practices in recognized hospitals of Delhi.

Rationale of study

The waste generated during the course of healthcare activities carries higher chances of injury than the other waste. Improper practices of handling biomedical waste and improper disposal of those wastes can cause serious health consequence and it may have serious impact on environment. Effective management of those wastes isn't only legally necessary but also it's our social responsibility. The aim of this study is to analyze the prevailing biomedical waste management

practices of various hospitals so as to understand if guidelines are followed and waste is disposed properly creating less harmful effects on environment and posing less threat to healthcare workers.

Objective

GENERAL OBJECTIVES

To analyze the biomedical waste management practices existing in tertiary care hospitals of Delhi.

SPECIFIC OBJECTIVES

• To analyze if wastes generated in each category are segregated properly in line with the color coding of bags.

• To analyze if proper weight of biomedical waste generated in each bag is recorded on daily/monthly/yearly basis.

• To explore if there are basic waste disposal facilities available like Incinerators, plasma pyrolysis, Autoclave, shredder, Needle tip cutter, deep burial pits and concrete pits, Chemical disinfection etc.

• To explore if trainings regarding biomedical waste management is conducted for healthcare personnel at regular intervals.

• To explore if biomedical waste management procedures are recorded on site.

Methods and Materials

TYPE OF STUDY - DESCRIPTIVE STUDY

Sources of data collection

The study involved Google search engine and data was collected from annual biomedical waste management reports of varied hospitals of Delhi (both

government and private) including SOPs of hospitals. Also, report on biomedical waste management in hospitals and path labs located in Delhi by NDMC and moef was also collected and reviewed.

Keywords for search

Biomedical waste, waste management, hospitals of Delhi, annual report, BMW report, government hospitals, private hospitals etc.

Inclusion Criteria

Annual biomedical waste management report of both government and private hospitals located in several regions of Delhi mainly south Delhi, north east Delhi, central Delhi, north Delhi and north west Delhi and those starting from 70 bedded to 2000 bedded are included. Reports by hospitals of financial year 2017-18 onwards and report by NDMC and ministries of environment and climatic change are studied.

Exclusion criteria

This had to be considered in case of hospital chains which has branches in several parts of India. Reports of financial year before 2016 were excluded.

Targeted hospitals

Tertiary care settings which are known to be best hospitals in Delhi. Hospitals having best healthcare facilities and specialist doctors, having high value and known for its outstanding performance since years. Both private and government hospitals are targeted. Private hospitals are mainly top notch hospital chains having branches in several cities. Best government hospitals of Delhi are targeted. Hospitals included within the study are **AIIMS, Sri Action Balaji Paschim Vihar, Lady Harding medical college, Fortis Vasant Kunj and MAX Shalimar Bagh, Sitaram Bhartia, Aakash Healthcare Dwarka.**

Statistical data and knowledge gathered are used as secondary database and a descriptive study base has been constructed.

Result and Analysis

The biomedical waste is segregated according to color coding and generated waste is transported to central collection point of hospital. Treated or untreated waste is handed to CBMWTF provider may be public or private. Different facilities for waste disposal are present in every hospital.

A) AIIMS Delhi

TABLE: 1

BAG	Waste Generated Yearly
Yellow	3,46,459 kg/annum
Red	3.42,616 kg/annum
White	6,232 kg/annum
Blue	3,53,289 kg/annum

Findings:

Results and findings of waste management practices from table 1 and BMW report of AIIMS are combined and analyzed. It had been found that total wastes generated are categorized in different color coded bags.

They're weighted daily and Proper records are maintained at the time of onsite collection. They follow the fundamental guidelines of biomedical waste management .Details of storage, treatment, transportation, processing and disposal handled by CBMWTF.

Facilities available for waste disposal includes Incinerators, Plasma pyrolysis,Autoclaves,Microwave, Hydroclave,Shredder,Needle tip cutter, concrete pits, Deep burial pits and Chemical disinfection.

Proper training for BMW management to healthcare staff is provided at regular intervals.

B) LADY HARDING MEDICAL COLLEGE, Delhi

TABLE: 2

BAG	WASTE GENERATED DAILY
YELLOW	200.66kg/day
RED	285.36 kg/day
WHITE	60.6kg/day
BLUE	N.A

Findings:

Results and findings of waste management practices from table 2 and report of BMW management in LHMC from moef are combined and analyzed. It had been found that total wastes generated are categorized in several color coded bags. They're weighted on a daily basis and Proper records are maintained at the time of onsite collection.

Waste disposal facilities include Autoclave, Chemical disinfection, shredder and needle cutter. LHMC doesn't have facilities like plasma pyrolysis, deep burial pits, Sharp encapsulators etc. but, it has its own ETP.

Proper training on BMW management is provided to healthcare staff regularly. The training is mandatory for all staff within 1 month of joining.

Guidelines for waste management are followed. Sterilization protocols in high risk areas of hospital are maintained strictly. Surveillance of Hospital acquired infections are carried out. Healthcare staffs are vaccinated against hepatitis b.

C) Sitaram Bhartia Institute of Medical Sciences

Table: 3

BAG	WASTE GENERATED Yearly
YELLOW	6975.8 kg/annum
RED	6784.91 kg/annum
WHITE	502.4 kg/annum
BLUE	2449.6 kg/annum

Findings:

Results and findings of waste management practices from table 3 and BMW report of Sitaram Bhartia are combined and analyzed. It had been found that total wastes generated are categorized in different color coded bags.

They're weighted daily and Proper records are maintained at the time of onsite collection. They follow the fundamental guidelines of biomedical waste management .Details of storage, treatment, transportation, processing and disposal handled by CBMWTF.

Facilities available for waste disposal includes Incinerators, Plasma pyrolysis,Autoclaves,Microwave, Hydroclave,Shredder,Needle tip cutter, concrete pits, Deep burial pits and Chemical disinfection.

Proper training for BMW management to healthcare staff is provided at regular intervals.

D) Fortis Vasant Kunj

Table: 4

BAG	WASTE GENERATED Monthly
YELLOW	1947 kg/month
RED	2614 kg/month
WHITE	165 kg/month
BLUE	697 kg/month
General Solid Waste	8400 kg/month

Findings:

Results and findings of waste management practices from table 4 and BMWM report of Fortis are combined and analyzed. It had been found that total wastes generated are categorized in numerous color coded bags. They're weighted daily and Proper records are maintained but not onsite.

Waste disposal facilities includes Incinerators, Plasma pyrolysis, Autoclaves, Needle tip cutter, Sharps encapsulators, concrete and deep burial pits, chemical disinfections etc.

Fortis has biomedical waste management committee. Standards are followed for proper sterilization and disinfection of high risk areas. Proper training on BMW management is also provided for staffs.

E) Aakash Healthcare, Dwarka

Table: 5

BAG	WASTE GENERATED Monthly
YELLOW	19626.5 kg/annum
RED	34833.7 kg/annum
WHITE	1769.98 kg/annum
BLUE	8409.75 kg/annum
Cytotoxic bags	121.84 kg/annum

Findings:

Results and findings of waste management practices from table 5 and report of BMW management in Aakash Healthcare are combined and analyzed. It had been found that total wastes generated are categorized in several color coded bags. They're weighted on a daily basis and Proper records are maintained at the time of onsite collection.

Waste disposal facilities include Autoclave, Chemical disinfection, shredder and needle cutter, Sharps encapsulators. Aakash Healthcare doesn't have incinerator

but, it has its own ETP.

Proper training on BMW management is provided to healthcare staff regularly. Guidelines for waste management are followed. Sterilization protocols in high risk areas of hospital are maintained strictly. Surveillance of Hospital acquired infections are carried out.

F) Max Shalimar Bagh

Table: 6

BAG	WASTE GENERATED Monthly
YELLOW	37209 kg/annum
RED	37041 kg/annum
WHITE	2906 kg/annum
BLUE	8038 kg//annum
Cytotoxic bags	2207 kg/annum

Findings:

Results and findings of waste management practices from table 5 and BMWM report of MAX are combined and analyzed. It had been found that total wastes generated are categorized in several color coded bags. They're weighted on a daily basis and Proper records are maintained onsite.

Facilities available for waste disposal at MAX includes Incinerators, plasma pyrolysis, Autoclave, Hydroclave, shredder, Needle tip cutter. No deep burial pits and concrete pits available. Chemical disinfection is additionally not carried out here.

BMW management is roofed by hospital infection control committee. Sterilization and disinfection of high risk areas is completed strictly. Training on BMW management for healthcare staff is provided.

Discussion:

Segregation of waste is most significant step of BMW management. General waste is separated from medical waste at the waste production sites. They're stored and disposed off separately in hospitals. Waste is segregated into different color coded containers/bins and disposed off accordingly. For proper segregation of waste appropriate number of bins with proper color code should be kept at all waste generation areas. It's also important to segregate waste into infectious and non-infectious waste per rules and standards of waste management. During a study done at PDU medical government college and civil hospital, Rajkot, 86.9% healthcare staff followed proper practice of segregation of waste at workplace. In present study it had been found that waste segregation in several color coded bags was done in every hospital. Basic infrastructure for segregation was available.

Disinfection of waste is commonly ignored or overlooked by healthcare workers as direct patient care is their primary duty and rest everything comes secondarily for them. They don't appreciate the indirect health threat posed because of biomedical waste generated. During a study done at Janna government hospital Ajmer, it had been found that waste from Operation theatres, pathological labs are disposed off without sterilization and disinfection. Therefore, the requirement for good quality training to healthcare professionals regarding biomedical waste management could be a must.

Disposal of waste should be done following the protocols. it's vital to disfigure used recyclables like used syringes, plastic saline and medicine bottles etc. in line with WHO, few companies have come up which takes used syringes and recyclable waste from waste stream and circulate in unauthorized and unregulated market after processing it.

Hospitals should have basic infrastructure available for waste disposal. But, in most of the hospitals of India, Proper guidelines for BMW management aren't followed due to lack of facilities available. During a study done at tertiary care teaching hospital at Ludhiana, deficiency in supply of needle cutters in 40% of wards was found.

Medical waste generated in hospitals are collected daily and transported to temporary storage area daily in wheeled trolleys or carts made for this purpose. The healthcare staff doing this work should wear protective masks, gloves; boots etc. Hospitals should maintain records at time of onsite transportation also.

Recommendation

Specific recommendations

• Hoardings on segregation of waste in different containers should be placed in every department.

• Covered color coded containers with foot operated lids should be used rather than uncovered or open bins for segregation of waste.

• Training on BMW at regular intervals should be made mandatory for all healthcare staff.

• Common disposal facilities should be available at each healthcare setting.

• BMW management committee should be made in each hospital so that they can monitor the disposal of waste closely.

• Details of injury during BMW management mostly needle stick injury should be recorded.

General recommendations

• ETP should be constructed in each and every hospital

• Details of ETP sludge generated during treatment of waste should be recorded.

• Hospital staff should be vaccinated against hepatitis B and Tetanus

• Surveillance of HAI should be done in high risk areas.

• Waste generated shouldn't directly be dumped into STP.

• Pre-treatment of reusable items should be finished chemical sterilization methods.

REFERENCE

- (healthcare, 2019)
- healthcare, F. (2019). *Biomedical waste management annual report*. Delhi: Fortis Shalimar bagh.
- (healthcare, Biomedical waste management SOP Fortis)
- healthcare, F. (n.d.). *Biomedical waste management SOP Fortis*. Retrieved May 20, 2020, from www. Fortis healthcare.com: http://cdn.fortishealthcare.com/0.59062000_1469511231_Bio-Medical-Waste-Management-SOP_2.pdf
- BioMedical Waste Record: Aakash Healthcare [Internet]. BioMedical Waste Record | Aakash Healthcare. [cited 2021Jun6]. Available from: https://aakashhealthcare.com/bio-medical-waste-record
- https://www.sitarambhartia.org/wp-content/uploads/2020/10/DPCC-Annual-report-2019-1.pdf. Available from: https://www.sitarambhartia.org/wpcontent/uploads/2020/10/DPCC-Annual-report-2019-1.pdf
- http://moef.gov.in/wp-content/uploads/2018/04/Final-BMW-report-NDMC-1.pdf. Available from: http://moef.gov.in/wp-content/uploads/2018/04/Final-BMW-report-NDMC-1.pdf
- Bio Medical Report: Max Hospital [Internet]. Best Hospitals in India: Medical Treatment & Diagnosis. [cited 2021Jun1]. Available from: https://www.maxhealthcare.in/bio-medical-report
- https://s3-ap-southeast-1.amazonaws.com/s3.fortishealthcare.com/BMW+Annual+Report+Jan+2019+to+Dec+2019.pdf. Available from: https://www.fortishealthcare.com/india/fortis-flt-lt-rajan-dhall-hospital-in-vasant-kunj-delhi

- Kumar R, Gupta AK, Aggarwal AK, Kumar A. A descriptive study on evaluation of bio-medical waste management in a tertiary care public hospital of North India. Journal of Environmental Health Science and Engineering. 2014;12(1).

- Sharma M, Sharma M, Kapoor P, Verma S, Maheshwari R, Gupta HP. Assessment of Knowledge, Attitude and Practice Regarding Biomedical Waste Management among Health Care Personnel in Jawahar Lal Nehru Medical College and Hospital, Ajmer (Rajasthan). International Journal of Medical Research Professionals. 2016;2(4).

- MATHUR PRAVEEN, PATAN SANGEETA, SHOBHAWAT ANANDS. Need of Biomedical Waste Management System in Hospitals – An Emerging issue – A Review. Current World Environment. 2012;7(1):117–24.

- Aiims C. BIO-MEDICAL WASTE MANAGEMENT [Internet]. AIIMS NEW. [cited 2021May5]. Available from: https://www.aiims.edu/en/departments-and-centers/central-facilities/265-biomedical/7590-bio-medical-waste-management_monthly_report.html

- JRMDS editor. Biomedical Waste Management: A study of knowledge, attitude and practice among health care personnel at tertiary care hospital in Rajkot [Internet]. Indian Journal of Community Medicine. [cited 2021May6]. Available from: https://www.academia.edu/4821644/Biomedical_Waste_Management_A_study_of_knowledge_attitude_and_practice_among_health_care_personnel_at_tertiary_care_hospital_in_Rajkot

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