



Generation of biomedical waste in district hospital Udhampur, Jammu and Kashmir

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Abstract: Biomedical waste is the waste produced during diagnosis, treatment or immunization of human beings or animals. The study have been under taken to assess the Biomedical waste generation in District hospital Udhampur, J&K. The biomedical waste generated have been quantitatively estimated using spring balance on weekly basis. The waste generated have been categorized into infectious and non-infectious waste . The hospital have been monitored for the period of one month. Monthly average of infectious waste is 91.75 ± 25.3 and non-infectious waste is 1528.25 ± 128.2 respectively. Maximum amount of infectious waste have been generated in 2nd week and non-infectious waste in 4th week of the month respectively.

Keywords: Biomedical waste, Infectious, Non-Infectious, Generation.

Introduction

Wastes are defined as unwanted material which is not usable. It can also be defined as any substance which is discarded after its primary use or which is of number of uses. Wastes are produced from various sources like from houses during household activities, hospitals, agricultural fields, institutions, treatment plants, mining operation, and many more such activities. Our daily activities generate large variety of waste from various sources. Many items that can be considered as waste include household rubbish, sewage sludge, packaging items, wastes from manufacturing activities, garden waste, discarded cars, old televisions, old paint containers etc. Among all these waste one such example is Biomedical waste.

Bio-medical waste means “any wastes that generates during the diagnosis, treatment or immunization of human beings or animals, or in research activities pertaining there to, or in production or testing of biological or in health camps”. Biomedical wastes posses hazard due to two main reasons i.e. infectivity and toxicity.

Hospitals have traditionally been regarded as places where sick people go to shed off their disease, depression, disabilities and worries and come out as healthy people. But studies on hospitals have painted a very different picture of hospitals. It has been documented that hospitals don't only treat disease and infections but also do serve as places for the transmission and acquisition of infections (Lakahtria, 2011). The waste generation rate ranges from 0.5 to 2.0 Kg per day per bed. General waste is 85% remaining 15% is hazardous and infectious waste which include anatomical waste (10%), laboratory waste (3%), radioactive waste (1%) and sharps (1%).



A study at S.N medical college by S.V.S Chauhan and S.Sharma found many garbage dumps in and around the health care facilities, which have been frequently visited by rag pickers. These rag pickers collect used needles, disposed drugs, syringes and PVC items from garbage dumps. This practices not only encourages disposables being repacked and sold out without proper disinfection but also expose themselves to injuries with sharps and other infections (Choudary et al. 2017).

Bio-medical wastes is potentially infectious. Biomedical wastes may be solid or liquid. Examples include discarded blood, sharps, unwanted microbiological cultures and stocks, identifiable body parts, other human or animal tissue, used bandages and dressings, discarded gloves, other medical supplies that have been in contact with blood and body fluids, and also laboratory wastes. Sharps include contaminated used and unused discarded needles, scalpels and other devices that are capable of penetrating skin. Bio-medical waste requires a systematic and scientific approach for their disposal to make it as hygienically and economically as possible, thereby minimizing risk to health and environment (Lakahtria, 2011).

Keeping in view the hazards caused by biomedical waste generation and the associated problems, the present study have been undertaken with the following objectives-

- 1) To quantitatively estimate the amount of General/Non-infectious waste generated in District Hospital Udhampur.
- 2) To estimate the amount of infectious Biomedical waste generated in District Hospital Udhampur.

Materials and Methods

The present study conducted in District hospital Udhampur having total bed capacity of 200 beds. A thorough survey of hospital have been done to assess the type of Biomedical waste generation. The waste generated from each ward were monitored for thirty days from 17/03/2017 to 15/03/2017. Average of infectious and non-infectious waste have also been calculated. The waste generated from various wards were weighed with the help of spring balance. Waste have been collected for the study period of one month and sampling have been done at an interval of one week.



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Wards available in District hospital Udhampur are showing in Table 1:

| S.no | Wards |
|-------------|-------------------|
| 1. | Patient services |
| 2. | Medical |
| 3. | Operating theater |
| 4. | ICU |
| 5. | Emergency |
| 6. | Radiology |
| 7. | Laboratories |
| 8. | Biochemistry |
| 9. | Pathology |
| 10. | Blood Bank |
| 11. | Pharmacy |
| 12. | Laundry |
| 13. | Kitchen |
| 14. | Administration |
| 15. | Public areas |
| 16. | Surgical |

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Results and Discussion

Amount of waste generated per week (in Kg) showing in Table 2:

| Waste (in Kg) | Infectious | | | | Non-Infectious |
|---------------|------------|-----|-------|------|----------------|
| | Yellow | Red | White | Blue | Waste (in Kg) |
| Week I | 36 | 53 | 1.2 | 10 | 1,590 |
| Week II | 23 | 26 | 1 | 11 | 1,668 |
| Week III | 30 | 43 | 1.7 | 10 | 1,481 |
| Week IV | 70 | 41 | 1.1 | 9 | 1,374 |

Maximum amount of infectious waste is generated in the 4th week of the month and maximum amount non-infectious waste is in the 2nd week of the month respectively.

Weekly percentage of biomedical waste generation is showing in Table 3:

| Study Period | Infectious Waste | Non-Infectious Waste |
|--------------|------------------|----------------------|
| Week I | 5.92% | 94.07% |
| Week II | 3.52% | 96.47% |
| Week III | 5.40% | 94.59% |
| Week IV | 8.09% | 90.09% |

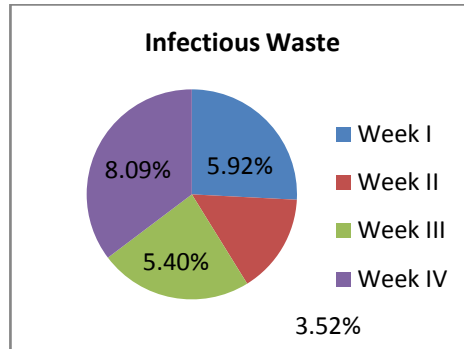


Fig. 1: Showing amount of infectious waste generated per week.

The amount of Infectious waste generated per week in District Hospital Udhampur J&K. have been reported to be 5.92% during Ist week. In 2nd week 3.52% of Infectious waste have been produced. In the 3rd week 5.40% of Infectious waste have been produced and 8.09% of Infectious waste have been produced in the 4th week of the month which is largest amount of infectious waste produced in the entire month Which may be attributed to the number of patients being attended by the doctors.

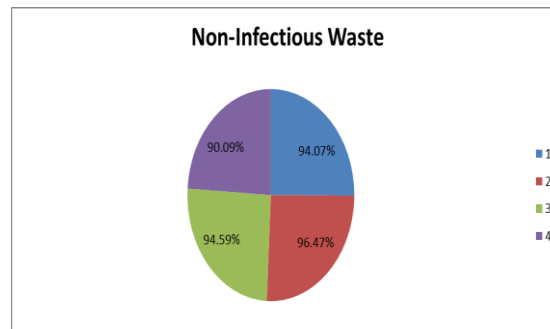


Fig. 2: Showing amount of Non- Infectious Waste generated per week.

The amount of Non-Infectious waste generated per week in District Hospital Udhampur, J&K have been reported to be 94.07% during Ist week. In 2nd week 96.47% of Non-Infectious waste have been produced. In the 3rd Week 94.59% of Non-Infectious waste have been produced and 90.09% of Non-Infectious waste have been produced in the 4th week of the month. In the 2nd week largest amount of Non-Infectious waste have been produced which may be attributed to the number of visitors who visited the patients may be more than the normal.



Monthly average of Infectious and Non-Infectious waste showing in Table 4.

| Type of waste | Average |
|----------------|--------------------------------|
| Infectious | 91.75 ± 25.3 (13.5 - 33.4) |
| Non-Infectious | 1528.25 ± 128.2 (175 - 255) |

Monthly average of Infectious waste have been recorded as 91.75 ± 25.3 and ranged from 13.5-33.4 and non-infectious waste is 1528.25 ± 128.2 and ranged from 175-255.

Conclusion

The present study conducted to determine the amount of generation of Infectious waste and Non-Infectious waste in District hospital Udhampur, J&K. Different color coded bags i.e. Yellow, Red, Blue, white, black and green are being used for waste collection. The waste generated from various wards were weighed with the help of spring balance. Waste have been collected for the study period of one month and sampling have been done at an interval of one week. Monthly average of infectious waste is 91.75 ± 25.3 and non-infectious waste is 1528.25 ± 128.2 respectively. Maximum amount of infectious waste is generated in the 4th week which may be attributed to the number of patients being attended by the doctors and maximum amount of non-infectious waste generated in the 2nd week which may be attributed to the number of visitors who visited the patients may be more than the normal. The infectious waste generated needs to be properly incinerated so that it will not cause any harm to the staff and the public nearby in the vicinity of the hospital. In case, of non-infectious waste it is divided into two categories Biodegradable and non-biodegradable. Biodegradable waste which contains food stuff, garbage should be composted and convert in the form of manure rich in nutrient and the non-biodegradable waste which contain plastic bottles, polythene bags should be recycled so that they can again be used. District hospital Udhampur, J&K has received an award named Kayakalp for patient care and host of other indicators and is considered as one of the best in J&K. Kayakalp is a national initiative launched by Ministry of Health and Family Welfare to give award to those public health facilities that demonstrate high level of cleanliness, hygiene and infection control. Other private and



Government hospitals should also follow the management and disposal practices as followed in this hospital so that Biomedical waste will not cause any harm to the public.

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