

Hospital Solid Waste Supervision in Chitrakoot, Uttar Pradesh, India

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Abstract: *The present study aimed to evaluate the management of medical waste at the hospitals and dispensaries in Chitrakoot. Hospitals which provide relief to the ailed can also create health hazards in long term. Assessment of medical waste and management in hospitals found that there was insufficient separation between hazardous and non-hazardous wastes. It was also noted that in absence of necessary rules and regulations for collection, transport and treatment of waste, a lack of training and protective equipment. Medical waste in primary health care centres and private clinics showed that most workers in the public sector did not follow correct methods of handling medical waste was also worked out.*

Keywords: hospital wastes, hazardous waste, equipment, dispensaries, medical waste

1. Introduction

The economy of the district is predominantly agricultural and a vast majority (90.44%) of people resides in the rural areas as per the 2011 census. The population of Chitrakoot is 10 lakhs, out of which 5.28 lakhs are male and 4.72 lakhs are females (Census, 2011). Waste originate from several activities of human life comprises various types, including hospital waste generated from medical facilities and practices, as a result accumulation of waste causes negative effects on human health and his environment. Hospital- waste handling is a hazardous waste activity which requires a high standard of training. It requires specific training that depends on the nature of the work in the hospital, the hazards and possibility of worker exposure, and the responsibilities of individual workers (Manyele and Anicetus, 2006).

Where it is now commonly recognized that certain types of medical waste are among the most hazardous and potentially dangerous of emerging wastes across many communities (Bdour et al., 2006) where medical waste can be classified into two major groups: general and hazardous waste (Taghipour and Mosafieri, 2009). All waste materials which is generated by hospitals are not hazardous in nature but only a part of these wastes are infectious which is laden with fatal microorganisms of many serious contagious diseases, which easily spread into the water bodies and air (Dwivedi et al., 2009).

To minimize these problems many efforts have been done or are being done at the international level. For safe and scientific management of biomedical waste, handling, segregation, mutilation, disinfection, storage, transportation and finally disposal are vital steps for any health care centre. In developed countries these vital steps are being adopted by all the institutions related to the health problem (Acharya and Singh, 2000). Most of the hospitals generate solid and liquid wastes of different natures, some of which are hazardous as well. All surveyed have not labelled collection container with colour coding (Red, Black, Yellow, White or Blue) for collection of different types of wastes, according to the nature of

wastes. Government institutions have not conducted any training program to train their staff about safe handling of biomedical waste. None of the hospitals were found to have a record for the amount of wastes they are generating.

None of the institutions have been found in practice to reduce, eliminate and recycle their toxic chemicals, equipments and materials return program. Though all the institutions have mercury containing equipment and equipments falling under universal waste (batteries, lamps, mercury, and thermostats) but none had the proper facility to prevent release of these to the environment. None of the hospitals are found to recycle their used articles like paper, aluminium cans, card board, steel cans, sharps, news paper, toner cartridges, solvent, fixers, pallets, inkjet cartridges, wood, printer ribbons, lead aprons, motor oils, pharmaceuticals, box board, computer, ice packs, coolers, glass, silver recovery, construction wastes, mercury, X-ray films, batteries, plastics, alkaline, nickel, cadmium and lead acid. Three out of the four surveyed institutions claim to have on-site incineration facility. The disposal of their red bag waste is performed through on-site incineration. Autoclaving or other methods of disposal are not in practice in any of the selected areas a record regarding the production of extremely hazardous substances, amount and the types of wastes is not maintained by any hospitals. Likewise, there is no reporting system of these records to higher authorities. Certain articles and instruments for e.g. patient dishware, employee dishware, glass ware, baking pans, metal trays, bath basins, bed pans, urinals, pillows, instruments pans, splash basins, ,medicine cups, gowns towels, drapes, ventilator tubing, pulse dosimeters, suture removal kits and vaginal speculum are reused by health institutions.

Study Area

In the light of assessment and management of hospital waste all types of like government hospitals; private hospital nursing home and clinic in the Karwi (Chitrakoot) of Uttar Pradesh were selected as the study sites. The study was carried out by collecting information through the "Self-Assessment Audit Form" in 2012-13. There are

following study site selected to observe hospital waste status:

1. District Hospital Chitrakoot - There are 1 government hospital
2. Private Hospital - 2 private hospital
3. Nursing home - 7 Nursing home
4. All clinic of Karwi - 25 clinics in the Karwi

Study sites 1, are government organizations, while the study site 2, 3, 4 are a private. The selected study sites have been surveyed regarding facilities; the main problem in the city Chitrakoot is that the waste is being dumped anywhere and everywhere. Also improper collection, transportation and disposal of waste lead to negative impact on the health, sanitation, environment and life style of the city Chitrakoot Nagar.

2. Methodology

Sampling was carried out for each category and vital information included nature of waste generation and disposal methods for both solid and liquid wastes for further, detailed analysis regarding the total hospital activities such as, total outdoors, indoors, pathological investigations etc. Data were obtained by questionnaires to

hospital staff such as consultants, nurses, cleaners, pharmacists, personnel. The questionnaires were designed in such a way as to enable respondents indicate the kind of wastes they generate and their disposal methods. Some important services were not available in the hospital like Blood bank was not there in whole district which is a major deficit in the health facilities. Major complications cannot be handled without availability of blood. This is the reason for not conducting the caesarean section deliveries in the hospital.

BMW service was outsourced by a private company. Condition of BMW was very poor, colour coded buckets were not used properly; even staff doesn't have adequate knowledge on the usage of the colour coded buckets for dumping the waste. Metal sharps were not disposed in puncture proof bags. However, waste bins were not overfilled and they uses disposable gloves and do not use them twice.

Categorisation of bio-medical wastes:

Bio-Medical waste have been categorised into ten different categories as mentioned in the table below:

Table 1: Colour coding and type of container for disposal of biomedical wastes

Colour Coding	Type of Container -I Waste category	Treatment options as Per Schedule I
Yellow	Plastic bag Cat. 1, Cat. 2, and Cat. 3, Cat. 6.	Incineration/deep burial
Red	Disinfected Container/plastic bag Cat. 3, Cat. 6, Cat.7	Autoclaving/Microwaving/ Chemical Treatment
Blue/White Translucent	Plastic bag/puncture proof Cat. 4, Cat. 7. Container	Autoclaving/Microwaving/ Chemical Treatment and
Black	Plastic bag Cat. 5 and Cat. 9, and Cat. 10. (solid)	Disposal in secured landfill

3. Results and Discussion

District Hospital is a 100 bedded hospital with 24 specialist doctor. It is working 24X7 hrs.

District women hospital is also a part of this hospital but now it attached to main hospital. All the delivery and labour related emergencies are tackled by DH.

There are only 3 nurses available in the district hospital. As such there is no FRU (First referral unit) present in the district, but 30 beds were used for MCH (Maternal & child health) care in the DH which is treated as FRU.

Table 2: Number of doctors at District Hospital, Chitrakoot

Doctor	No. of doctor
Physician	1
Orthopaedician	4
General Surgeon	2
Anaesthesiologist	2
Radiologist	1
Pathologist	1
Lab technician	3
Dentist	1
Women specialist	2
Pharmacist chief	1
Pharmacist	6
Total	24

Table 3: Total produced waste from hospitals in a year: 450.525 quintal

Types of waste	Government hospital	Private hospital-1	Private hospital-2
Infectious waste	40	10	5
Sharps	3	2	1.5
Pathological waste	15	5	3
Pharmaceutical waste	12	4	2
Waste with high content of heavy metal	10kuntal/year	40 kg/year	30 kg/year
Pressurized container	10 kg/year	-	-
Radioactive waste	-	-	-
Chemical waste	15	2	1
Cytotoxic waste	-	-	-
No. of patient/day	400	200	100
Total waste/year	320.25 quintal	84.35 quintal	45.925 quintal

Table 4: Data of produced waste from Nursing home: (in approximate)

Types of waste	NH-1	NH-2	NH-3	NH-4	NH-5	NH-6	NH-7
Infectious waste	1	4	1	3	4	-	10
Sharps	2	3	2	3	4	3kg/month	3
Pathological waste	2	-	-	-	-	1 kg/month	-
Pharmaceutical waste	3	4	1	1	2	6 kg/month	5 kg/day
Waste with high content of heavy metal	30 kg/year	40 kg/year	20 kg/year	40 kg/year	45 kg/year	-	50 kg/year
Pressurized container	-	-	-	-	-	-	-
Radioactive waste	-	-	-	-	-	-	-
Chemical waste	-	-	-	-	1	-	-
Cytotoxic waste	-	-	-	-	-	-	-
No. of patient/day	50	70	35	40	60	15	150
Total waste/year	2950	4055	1480	2595	3695	120	6620

Total produced waste from NH in a year: 21515kg (215.15 quintal)

Table 5: Data of produced waste from clinics:(in approximate)

Clinics	I.W	S.W.	PT.W.	PH.W.	HM.W./year	P.C.	R.W	C.W.	CT.W.	NO.P.
C-1	3	2	-	2	40	-	-	-	-	100
C-2	-	250g	-	500g	-	-	-	-	-	20
C-3	-	200g	-	500g	-	-	-	-	-	15
C-4	-	500g	-	1kg	-	-	-	-	-	25
C-5	-	100g	-	250g	-	-	-	-	-	15
C-6	-	200g	-	500g	-	-	-	-	-	30
C-7	-	-	-	250g	-	-	-	-	-	15
C-8	1	1kg	-	2kg	20	-	-	-	-	25
C-9	-	1kg	-	250g	-	-	-	-	-	35
C-10	500g	500g	-	2kg	20	-	-	-	-	20
C-11	-	250g	-	500g	-	-	-	-	-	15
C-12	500g	500g	-	1kg	15	-	-	-	-	25
C-13	-	100g	-	250g	-	-	-	-	-	10
C-14	-	200g	-	500g	5	-	-	-	-	60
C-15	-	100g	-	250g	-	-	-	-	-	15
C-16	-	100g	-	250g	-	-	-	-	-	10
C-17	-	200g	-	250g	2	-	-	-	-	15
C-18	-	2kg	-	4kg	-	-	-	-	-	30
C-19	-	1kg	-	2kg	-	-	-	-	-	30
C-20	-	1kg	-	2kg	-	-	-	-	-	25
C-21	-	2kg	-	4kg	-	-	-	-	-	35
C-22	-	1kg	-	2kg	-	-	-	-	-	30
C-23	-	500g	-	1kg	-	-	-	-	-	20
C-24	2kg	3kg	-	5kg	40	50	-	-	-	40
C-25	-	250g	-	500g	-	-	-	-	-	15
Total w/day	7kg	17.950kg	-	32.750kg	-	-	-	-	-	-
Total w/y	2555kg	6551.75kg	-	11953.75kg	142 kg	50	-	-	-	-

Total produced waste from clinics in a year: 21252.5kg (212.525 quintal)

Total produced waste in Karwi (Chitrakoot): 21918.175 quintal

4. Conclusion

There was poor awareness about medical waste risks and safe handling procedures among hospital administrators and most hospitals were not differentiating between domestic and medical waste. Hospital waste should not be stored or dumped without proper processing. Hospitals must be aware and follow Biomedical Waste (Management and Handling) Rules to manage their waste. Budgets were not allocated for waste management purposes, which caused shortages in waste facilities handling equipment and supplies and absence of training programmes for staff, resulting in poor knowledge and practices of waste-workers, a high rate of injuries and possible exposure of staff and visitors to hazardous waste.

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