Original article

Assessment of biomedical waste management practices in a tertiary care teaching hospital in Ludhiana

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Abstract

Objectives : A study was undertaken to assess the Biomedical waste(BMW) management practices in a tertiary care, teaching hospital of Ludhiana, Punjab.

Methods : A 10% sample was selected randomly from each of the 3 categories of staff comprising 476 doctors, 378 nurses and 142 paramedical staff, on rolls. A semi-structured questionnaire was used to obtain information from respondents.

Results *:* The study showed gaps in the knowledge of all three categories of respondents. The knowledge of the existence of the BMW Management Rules 1998 was better in doctors than in the nurses or the paramedical staff, but knowledge of the practical aspects of BMW management was better in nurses and paramedical staff. The BMW management practices in the hospital were satisfactory, except for a deficiency in supply of needle-cutters in 40.9% wards.

Key Words : Bio-medical waste management, knowledge, practices

Introduction

Biomedical waste (BMW) is waste generated during diagnosis, treatment or immunization of human beings or animals, or in research activities pertaining thereto, or in the production and testing of biologicals, and is contaminated with human fluids.[1] Though 75-80% of wastes generated from hospitals are non-infectious, 20-25% is hazardous.[2] It is a potential health hazard to health workers, public, flora and fauna of the area.[3] The Government of India has given specifications for hospital waste management under the Environment (Protection) Act Biomedical Waste (Management and Handling) Rules 1998.[4] The present study was undertaken to assess the knowledge and practices regarding BMW management amongst staff of a large tertiary care teaching hospital in Ludhiana, with about 700 beds which, according to its Chief Maintenance Officer, generates about 70 kg biomedical waste per day.

Methods

The study comprised two parts:

Assessment of the knowledge regarding BMW management amongst doctors, nurses and paramedical staff of the hospital. For this purpose, a 10% sample of each of the 3 categories of staff on rolls was randomly selected for the study, and information was obtained from the respondents through a pre-tested questionnaire. The sample consisted of 100 respondents: 48 doctors, 38 nurses and 14 paramedical staff.

Observation of the actual practices of BMW management in the facilities of the hospital. The OPDs studied were Medicine, Surgery, Pediatrics, Gynecology, Casualty, laboratories and Blood Bank. 22 wards and 14 Operation Theatres were also observed.

Result

Table-1 shows the knowledge of the respondents regarding BMW management.

Doctors : The knowledge of the doctors was least for identification of biohazard symbol (79.2%), BMW Management Rules 1998 (85.4%), and methods of segregation (87.5%); better about the fact that BMW should not be stored for more than 48 hours (91.7%), for knowledge regarding methods of waste disposal and knowledge of the color coding system (93.7% each); and best for knowledge about categories of waste (95.8%) and knowledge of the diseases transmitted through improper BMW management (98.0%).

Nurses : The knowledge of the nurses was better for the more practical aspects of BMW management. 97.4% nurses knew the categories of BMW, 92.1% knew the color coding system, 94.7% were aware of the methods of segregation, 92.1% were aware that waste should not be stored for more than 48 hours, and 100% knew the methods of waste disposal. In these aspects the knowledge of the nurses was equal to or even better than the doctors. Their knowledge was less for the more theoretical aspects. 73.7% were aware of the existence of BMW Management Rules 1998, 86.8% were able to identify bio-hazard symbol, while 92.1% knew the diseases spread by improper waste management.

Table-1: Knowledge of Respondents

	Aware of existence of BMW management rules 1998	Know categories of waste	Know color coding system	Can identify biohazard symbol	Aware of methods of segregation	Aware that waste should not be stored for > 48 hrs	Know methods of waste disposal	Know diseases spread by improper waste management
Doctors (n=48)	41 (85.4 %)	46 (95.8 %)	45 (93.7 %)	38 (79.2 %)	42 (87.5 %)	44 (91.7 %)	45 (93.7 %)	47 (97.9 %)
Nurses (n= 38)	28 (73.7 %)	37 (97.4 %)	35 (92.1 %)	33 (86.8 %)	36 (94.7 %)	35 (92.1 %)	38 (100 %)	35 (92.1 %)
Para-meds (n =14)	10 (71.4 %)	14 (100 %)	13 (92.9 %)	13 (92.9 %)	14 (100 %)	14 (100 %)	11 (78.6 %)	12 (85.7 %)
Total (n=100)	79 (79 %)	97 (97 %)	93 (93 %)	84 (84 %)	92 (92 %)	93 (93 %)	94 (94 %)	94 (94 %)

Paramedical Staff : The knowledge of the paramedical staff was also similar to the nurses, in that the knowledge regarding the practical application of BMW management was higher than the more theoretical aspects. 100% paramedical staff knew the categories of BMW, 92.9% knew the color coding system, 92.9% could identify bio-hazard symbol, 100% were aware of the methods of segregation, 100% were aware that waste should not be stored for more than 48 hours; 71.4% were aware of the existence of the BMW Management Rules 1998, 78.6% knew the methods of waste disposal, and 85.7% knew about the diseases spread by improper waste management.

The BMW management practices were satisfactory and in accordance with the prescribed rules and standards in all 7 OPDs surveyed except for one OPD where collection and segregation as prescribed was deficient. BMW management practices observed in 22 wards and 14 operation theatres were in accordance with the prescribed rules and standards in all the 14 operation theatres. In the case of the 22 in-patient wards, needle cutters were observed to be present and in use in only 13 (59.1%) wards, apart from which all the BMW management practices were in accordance with the prescribed rules and standards in all the 22 wards.

Discussion

Certain deficiencies in the knowledge of various categories of hospital employees were identified. The doctors were observed to be sounder in theoretical knowledge than in the more practical aspects of BMW management. In the case of nurses and paramedical staff the reverse was true, i.e., though their theoretical knowledge lagged behind that of doctors, their practical knowledge regarding BMW management was better. The doctors' attitude towards BMW management is casual, while nurses and paramedical staff are more meticulous and careful. These findings in our study are in agreement with those of Saini, Nagarajan & Sarma.[5] Healthcare waste management should be supported through appropriate education, training and the commitment of the healthcare staff, management and healthcare managers.[6]

The BMW management practices in the hospital were satisfactory, except for a deficiency in supply of needle-cutters in a few wards. This is a typical example of an obstacle coming in the way of a mandatory practice, due to a problem of logistics. It is incumbent upon those responsible for procurement of supplies to ensure timely replacement of such items. It would be better if the user units could be provided with a few extra needle-cutters, and for the ward in-charge to request replenishment in time when the ward stock is near depletion, allowing adequate lead time for the Procurement Department to procure the item. It should be included in the stock items like other disposables and items of regular use, which are stocked in the Hospital and provided on demand immediately without loss of time.

Periodic CME sessions in the hospital would help reinforce and update knowledge of the different categories of employees on the subject of BMW management and motivate them to comply with the rules and guidelines regarding BMW management. This should be carried at the beginning of new sessions when staff turnover occurs and new personnel join the work force. Regular inspection of the wards and other areas by senior administrators of the hospital, as well as members of the Hospital Infection Control Committee would go a long way to ensure compliance where non-compliance is due to casual attitude of the workers.

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