Awareness and practices regarding bio-medical waste management among health care workers in a tertiary care hospital in Delhi

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Abstract

Health care institutions are generating large amount of Bio-Medical Waste (BMW), which needs to be properly segregated and treated. With this concern, a questionnaire based cross-sectional study was done to determine the current status of awareness and practices regarding BMW Management (BMWM) and areas of deficit amongst the HCWs in a tertiary care teaching hospital in New Delhi, India. The correct responses were graded as satisfactory (more than 80%), intermediate (50–80%) and unsatisfactory (less than 50%). Some major areas of deficit found were about knowledge regarding number of BMW categories (17%), mercury waste disposal (37.56%) and definition of BMW (47%).

Key words: Awareness, Bio medical waste management, Bio-medical waste mangement practices, Bio-medical waste awareness, health care worker, hospital, practice, tertiary care teaching hospital

Introduction

Health care waste is defined as the total waste stream from a health care facility.[1] Bio-medical waste (BMW) means any waste generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals, including categories mentioned in Schedule I of BMW Management (BMWM) and Handling Rules 1998.[2]

In 2011, it was estimated that gross generation of BMW in India was 4,05,702 kg/day of which only 2,91,983 kg/day was disposed, which means that almost 28% of the wastes was left untreated.[3]

In 2013, the hospitals and nursing homes in Delhi were found to generate 70 tonnes/day of BMW, out of which only 10.7 tonnes/day were being treated properly.[4]

A joint team of the Central Pollution Control Board (CPCB) and the Delhi Pollution Control Committee (DPCC), directed by the National Green tribunal (NGT) found that some hospitals of the capital were violating the BMW Rules.[5]

With this concern a study was conducted in a tertiary care teaching hospital in Delhi. with the aim to determine the current status of awareness and practices regarding BMWM among the healthcare workers (HCWs) in the hospital, to identify the areas of deficit and to forward the results to BMWM Committee (BMWMC) of the hospital to take requisite corrective action.

Materials and Methods

A cross-sectional indirect interview type of study was conducted in a 600 bedded tertiary care teaching hospital in Delhi over a period of one month, from 15th August to 14th September, 2013 through self-distributed pre-tested semi-structured questionnaires randomly distributed among four categories of HCWs: Doctors, nurses, technicians and other paramedical staff of the hospital. Each questionnaire was composed of two sections. Section A comprised of demographic profile of the subjects while Section B comprised of questions to test the awareness (Section B I) and practices (Section B II) regarding BMWM. The overall response of the participants was graded based on correct responses as: Satisfactory (more than 80%), intermediate (50–80%) and unsatisfactory (less than 50%).

Results

A total 120 questionnaires were distributed, out of which 110 (91.66%) were received back. The 110 respondents comprised of: 26 Doctors (23.64%), 29 Nurses (26.36%), 20 technicians (18.18%) and 35 other paramedical staff (31.82%). Doctors included in the study were senior residents.
(34%), interns (27%), post-graduate students (23%) and few senior doctors including teaching faculty members (4%), specialists (8%) and medical officers (4%). The paramedical staff comprised of laboratory assistants (54%), nursing orderlies (NO, 26%), Operation Theatre (OT) assistants (3%) and radiographers (17%). Period of work experience varied from less than 5 years (41.82%), 5–10 years (16.36%) and more than 10 years (41.82%) among the HCWs.

Grading of individual and overall responses is shown in Table 1 and Figure 1. The results of the study were forwarded to BMWMC to stress on the areas of deficit and to strengthen them by adequate training programmes.

**Discussion**

An active BMWMC exists in the hospital which has formulated action plans and guidelines for the BMWM and the same has been circulated to all the departments and displayed at major waste generating areas. This study was planned to check the awareness regarding BMWM among the hospital staff.

Overall only 17% of the HCWs were aware of the number of categories of BMWM [Figure 1]. Most of them categorized the wastes that had usually been generated in day care setting. This is similar to the finding of Madhukumar et al.,[6] (only 3.13% awareness). In our analysis, awareness about this was very poor amongst the technicians (0%) and nurses (0%) in contrast to the study by Madhukumar et al.,[6] and Mathew et al.,[7] where awareness about the same was quite high 62.5% and 100% amongst the technicians and paramedical staff respectively.

There was a lack of awareness regarding mercury waste disposal (62.44% unaware) [Figure 1] in our study which is in contrast to the findings of Charania et al.,[8] (only 35.2% improper disposal). This might be because his study was focused on dentists who commonly use mercury products whereas in our hospital use of mercury products has been phased out.

Among the HCWs 47% had knowledge regarding the definition of BMWM [Figure 1] which is similar to the finding of Desmukh et al.,[9] (36.9% aware) but was higher than findings of Kahn et al.,[10] (only 4.7% aware).

Overall response regarding the guidelines laid down by Government of India for BMWM was satisfactory (85%) [Figure 1]. However the awareness was least among the doctors (73%) as compared to the nurses (96.55%), technicians (90%) and other paramedical staff (88.57%) [Table 1]. This may be because majority of the doctors (86.61%) had work experience less than 5 years; moreover, 27% of the doctors were interns who had graduated outside India which could have been the reason for their lack of awareness regarding the Indian guidelines. This is in contrast with the findings of Narang et al.,[11]...

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**Table 1: Awareness and practices regarding BMWM amongst various HCWs**

<table>
<thead>
<tr>
<th>Awareness regarding BMWM (%)</th>
<th>Practices regarding BMWM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BWM</td>
<td>Def. of BWM</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Doctors (n=26)</td>
<td>96.55</td>
</tr>
<tr>
<td>Nurses (n=29)</td>
<td>90</td>
</tr>
<tr>
<td>Technicians (n=20)</td>
<td>37.50</td>
</tr>
<tr>
<td>Other paramedical staff (n=35)</td>
<td>88.57</td>
</tr>
</tbody>
</table>

**Def:** Definition, **Qnty:** Quantity, **No.:** Number, **cat.:** Categories, **HH:** Health hazards, **HS:** Hepatitis B Vaccination, **BP:** Needle prick, **BHS:** Biohazard symbol, **NSW:** Non-sharp waste.
doctors had a very casual approach towards segregation of waste (57.7%) in their previous study. In our study, only 63.46% of the doctors were aware of the same (Table 1). This is similar to the findings of Narang et al., [11] (85% dentists and 55% auxiliaries aware). Awareness regarding health hazards due to improper disposal of non-sharp waste was 68.27% and that of sharps was 86% respectively (Table 1). This is similar to the study of Narang et al., [11] (85% dentists and 55% auxiliaries aware).

Awareness regarding health hazards due to improper BMWM was found to be 60.10% [Figure 1]. In our study, only 63.46% of the doctors were aware of the same which is in contrast to the findings of Narang et al., [11] (100% aware).

Overall response regarding the practice of disposal of non-sharp waste was 68.27% and that of sharps was 86% [Figure 1]. In this regard, doctors’ response was 79.8% and 96.15% respectively followed by nurses (71.55% and 89.65% respectively) [Table 1]. This is similar to the study of Narang et al., [11] (85% dentists and 55% auxiliaries aware). Awareness regarding non-sharp waste disposal was 68.27% and that of sharps was 86% respectively (Table 1). This is similar to the findings of Narang et al., [11] (85% dentists and 55% auxiliaries aware).

Awareness regarding segregation was 53.76% among the HCWs [Figure 1]. This was in contrast to the finding of Narang et al., [11] in her previous study which was done at a private hospital (82% awareness). In our study, doctors had a very casual approach towards segregation of waste (57.7%) which is in contrast to the study of Selvaraj et al., [13] (98%). A reason for the same could be because of overloading of the patients in casualty and outpatient departments (OPD) in this government set-up with doctors prioritizing patient-care more than waste segregation.

References


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