Injection practices of healthcare professionals in a Tertiary Care Hospital

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KEYWORDS
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Abstract
Background: Unsafe injection practices are prevalent worldwide and may result in spread of infection. Thus the present study was planned to observe the injection practices of healthcare professionals (HCP), including aseptic precautions and disposal of used syringes/needle.

Materials and methods: Injection practices were observed in the outpatients and inpatients departments. Questionnaire was designed, tested and administered for this purpose.

Results: 130 patients receiving injections were observed. Overall injection practices of the HCP were satisfactory. However, unsafe practices with respect to not washing hands (95.4%), not wearing/changing gloves (61.6%), recapping of needles (12.2%), wiping of needle with swab (15.4%) and breaking of ampoule with solid object (44.4%) were observed.

Conclusion: The problem of unsafe injections can be successfully addressed by organizing continuing medical education/symposium/workshops for improving the knowledge, attitude and practices of the HCP. Periodic monitoring and such interventions may also further improve safe injection practices.

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Introduction

Unsafe injection practices coupled with overuse of injections may result in unacceptable and devastating events for patients and healthcare workers, or the community. Worldwide unsafe medical injections lead to 40% cases of hepatitis C, 32% hepatitis B, and 5% human immunodeficiency virus (HIV) infections each year [1]. Unsafe injection practices are also prevalent in India [2–4]. Recently, Epidemiology Network in India has
estimated that of the total 3–6 billion injections used each year, two-thirds were unsafe and had the potential to transmit blood-borne infections [5,6]. It has also been observed that unsafe injection practices account for 1.3 million deaths each year, a loss of 26 million years of life, and an annual burden of US$ 535 million [7].

In 2002, a healthcare worker reused the syringe and needle from a HCV positive patient, to obtain saline flush solution from an IV bag as a result nearly 100 Nebraska patients contracted HCV [8]. Similarly HCV outbreaks occurred in New York in 2002 and 2007, affecting a total of 102 patients [9]. Again in 2008, in Nevada, United States outbreak of HCV infection took place involving at least 115 patients [10]. Recently, in 2009 reuse of syringes and needle lead to outbreak of hepatitis B infecting over 125 and killing 49 people in Gujarat, India [11]. These outbreaks of HBV and HCV indicate that healthcare personnel do not adhere to basic principles of infection control, and identify a need to reinforce safe injection practices.

In this background the present study was planned to observe the injection practices of healthcare workers, including the universal aseptic precautions and disposal of used syringes/needle.

Materials and methods

The injection practices of the healthcare workers (HCW) were observed independently by two observers in the outpatients (OPDs) and inpatients (IPDs) departments of Lady Hardinge Medical College and Associated Hospitals, New Delhi. This was a cross-sectional questionnaire based study consisting of participant observation and data collection over a period of one week. A safe injection practices questionnaire with multiple options was designed, tested and administered. Questionnaire consisted of two parts, one concerned with the sterilization and waste disposal and the other was concerned with the technique employed to administer various injections. The observers went to OPDs and IPDs of the hospital and quietly observed the activity of HCW while they were preparing/administering/disposing the injection for a particular patient. The observer also interacted with the HCW to get few information, keeping in mind not to make the HCW self-conscious during the procedure. In OPDs observers visited the injection room between 9 am and 12.30 pm. Whereas in IPDs/wards they visited between 1 pm and 8 pm. Both the observers recorded their observation independently at the same time in questionnaire which was later on analyzed.

Results

A total of 130 patients receiving injections were observed. Intramuscular route (47.14%) was the commonest route in the outpatient department, whereas in indoor patients, intravenous route (76.67%) was the most common (Table 1). All injections were given using disposable syringes, at the correct site and using correct technique. Only 4.6% of health workers washed their hands before giving injection. Gloves were worn in 50 cases (38.4%). Site of administration of injection was cleaned with spirit soaked swab in 117 cases. In 44.6% multi-vials were used. In all cases it was observed that single needle was kept pierced in vial top and subsequent doses were drawn by using fresh syringes. Ampoules were opened by smashing neck with solid object in 44.6% of cases. Diluents were required in 42 cases (32.3%). Optimal amount of air was pushed before withdrawing the drug in majority (90%) of cases. After drawing the drug, syringe was put back in the tray in 70 cases (53.8%). Before injecting the needle, it was wiped with swab in 20 cases (15.4%). Plunger was drawn slightly to look for blood in 38 cases. Recapping of needles after use was done in 16 cases (12.2%), out of which 7 cases were done by single hands. Hub cutter for destroying the needle was available in 103 cases (79.2%). Bin to dispose off syringes was available in 99% cases.

Discussion

In developing countries unsafe injection practices have been reported to occur in at least 50% of cases each year [12]. Unsafe injection practices include reusing syringe or needle, changing the needle but reusing the syringe, giving injection when there are safer alternatives, leaving a needle in the vial to withdraw additional doses, touching the needle, recapping needles, placing needles on a surface or carrying them any distance prior to disposal, leaving used syringes in areas accessible to the public [13].

Overall injection practices of the healthcare workers in this study were found to be satisfactory, site of injection and the technique used were correct. All injections observed involved disposable syringes without reuse which is highly commendable. Few studies have shown that although in 100% of cases disposable syringe and needle were used,
needles were changed on the same syringe in 31% cases and syringes and needles were reused in 8% cases [14].

However unsafe practices with respect to not washing hands, not wearing/changing gloves, repeated handling of sharps like needle, wiping of needle with swab and breaking of ampoule with solid object were present. Washing hands and wearing/changing gloves have a vital role in minimizing spread of infection, this may not be feasible all the times and situations as the paucity of the facilities, higher cost of hand sanitizers and heavy patient load are some of the barriers. Providing low cost hand sanitizers may be the workable solution to the problem. It has been advocated that the need for disinfecting hands in between injections varies depending upon the settings and whether there is any contact with soil, blood or body fluids. Study done by Borders et al. has shown that injections administered in absence of hand washing did not caused infections [15]. However, it is important that healthcare worker should avoid giving injections if the skin integrity is compromised.

In our study use of multi-vials, where it was observed that single needle was kept pierced in vial top and subsequent doses were drawn by using fresh syringes, was observed in 44.6% of cases, higher than that reported from a study done in Pune [16]. This is an undesirable practice frequently implicated in transmission of blood borne viral and bacterial infections [17,18]. Whenever possible single-dose vials should be used rather than multi-dose vials, however if multi-dose vials must be used than the vial top should be pierced with sterile needle each time and needle should not be kept pierced in the vial top.

In the present study breakage of ampoule with a metal file was observed in 44.4% of cases against 28% in a Govt. Hospital in Pune [16]. In rest of the cases solid object was used to break the ampoule which might be associated with more chances of injury. Studies have shown that healthcare workers may lacerate their hands while opening the ampoules which can lead to infections [19,20]. Use of pop-open ampoules or small gauze pad as barrier to protect fingers can minimize this injury.

Wiping of needle or vial tops with swab stored wet in antiseptics before giving injections is an unnecessary practice which was also observed in the present study in 15.4% cases. Studies have shown cotton swabs or gauze pieces stored wet in a multi-use container can become contaminated and contribute to infections [17,18].

In our study in 12.2% cases, recapping was done using two hands. In contrary to our study it was observed that recapping has been reported in 17%, 31% and 58% cases, in studies done in Gujarat, Swaziland and Cambodia, respectively [14,21,22]. Recapping with two hands is frequently reported to be associated with needle stick injury. Thus avoiding recapping of used needles is essential for preventing needle stick injury. From et al. have also shown in his study that teaching one handed, scooping-resheathing method can reduce the risk of needle stick injury [23,24].

To ensure safe injection practices globally World Health Organization has established the Safe Injection Global Network (SIGN) in 1999, a voluntary coalition of stakeholders. Every year SIGN partners and stakeholders meet to analyze the data and plan the next strategy for improving implementation of injection safety programs. In recently concluded meeting (2010) in Dubai it was decided to: develop an action plan to reduce unsafe injection practices worldwide by 50% by 2015 and multi-stranded educational interventions targeting the community to ensure safe injection practices. Since the establishment of SIGN, there is a remarkable reduction in unsafe therapeutic injection frequency which has prevented 430,000 HIV infections, 5 million HBV infections and 1 million HCV infections in the developing world each year. Now SIGN is planning to involve perinatal services i.e. labor, delivery and postpartum wards in their program to benefit the newborn and their mothers and to help in improving maternal and infant mortality rates specially in the developing world [25].

Use of Auto-disable (AD) syringes with an internal one-way valve, which automatically disables the syringe after a single use appears to be workable solution to promote safe injection practices. These syringes are much safer as compared to normal

<table>
<thead>
<tr>
<th>Injection type</th>
<th>In-patients, n (%)</th>
<th>Out-patients, n (%)</th>
<th>Total, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intramuscular</td>
<td>13 (21.67)</td>
<td>33 (47.14)</td>
<td>46 (35.38)</td>
</tr>
<tr>
<td>Intravenous</td>
<td>46 (76.67)</td>
<td>9 (12.85)</td>
<td>55 (42.32)</td>
</tr>
<tr>
<td>Subcutaneous</td>
<td>1 (1.67)</td>
<td>8 (11.43)</td>
<td>9 (6.92)</td>
</tr>
<tr>
<td>Intradermal</td>
<td>0</td>
<td>20 (28.57)</td>
<td>20 (15.38)</td>
</tr>
<tr>
<td>Total</td>
<td>60 (60%)</td>
<td>70 (70%)</td>
<td>130 (100%)</td>
</tr>
</tbody>
</table>
Safe injection practice is critical to prevent microbial contamination. In our study only single use disposable syringes and needles were used, selection of site for injection administration and its technique were correct. Few unsafe injection practices viz. not washing hands, not wearing/changing gloves, repeated handling of sharps like needle, wiping of needle with swab and breaking of ampoule with solid object, frequent use of multi-dose vials were observed, which needs to be addressed. Measures like inclusion of safe injection practices into the nursing and medical curriculum, pre-service and in-service training programs, continuing medical education, periodic workshops, should be organized to promote adherence by healthcare workers to these safe practices for the safety of patients and the community. Aim to reduce the use of unnecessary injections, and to spread awareness about this serious problem amongst both the healthcare workers and the general community will act as the starting point. However, the problem is complex and thus initiative to address these should be at global, country and community levels.

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Ethical approval
Not required.

References


