



Prevalence of Needle Stick Injury among Surgeons

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aim: To find out the prevalence of needle stick injury, its reporting system and the reasons behind it.

Study design: Descriptive cross-sectional

Place and duration of study: Study was conducted at Jinnah post-graduate medical center (JPMC) Karachi during the period of March to September 2019

Methodology: A self-designed, self-explanatory questionnaire was used, consisting of two parts, the first part was about demographic information while second part is for information related to needle stick injury like probable cause, frequency, response after injury, post-exposure prophylaxis and about reporting of the incident. Questionnaire was validated by calculating the Cronbach's alpha which was 0.78. data was analyzed by using the Statistical Package for the Social Sciences (SPSS) version 20.

Results: Majority of the study participants were female (67.2%) and about 50% were postgraduate

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students. Out of total 134 doctors about 64.2% of the doctors had needle stick injury during their career. Finding out the most probable cause of needle stick injury during the survey it was found out that increased work load and prolonged working hours were the main reasons. Majority of the cases occurred in emergency department (41.9%). About 95.5% of the doctors didn't get any post-exposure prophylaxis. Majority of the participants (96.3%) did not report to any authority because of the lack of knowledge about the reporting policy, it was noted that about 38.8% were confused either the reporting system exist or not. Most of the injuries occur during the procedure of suturing followed by recapping syringes.

Conclusion: It has been concluded that majority of the doctors had faced needle stick injury during their career and a very negligible number of them got any post-exposure prophylaxis. Majority of them did not report to any authority. So there is a need of implication of safety measures and reporting policies for early detection and treatment of infections after needle stick injury.

Keywords: Needle stick injuries; blood borne infections; needle prick injury.

1. INTRODUCTION

There is a high incidence rate of needle stick injury worldwide [1]. Doctors especially the resident trainees are at high risk of these injuries as they are under process of learning surgical skills and to acquire technical expertise [2]. During their learning process, they used sharp surgical instruments and before getting expertise they are exposed to get frequent needle stick injuries [3]. As per data of Center for Disease Control and Prevention about 384,000 cases of needle stick injuries have been reported annually in hospitals of United States, out of which 236,000 cases are due to injuries by hollow bore needles [4]. while in United Kingdom 100,000 needle stick injuries occurs per annum [5].

Because of these needle stick injuries, surgeons are highly exposed to get the blood borne viral infections like Hepatitis B virus (HBV), hepatitis C virus (HCV) and human immune deficiency virus (HIV), during their carrier [6]. There is a risk of about 20-38% HBV, HCV and HIV infection among doctors during handling the surgical instruments in teaching hospitals [7]. These injuries can lead to severe health related complications beside psychological distress [8,9]. The guidelines given by Code of Practice suggested multiple safety factors to prevent needle stick injuries including use of double gloves, gowns and safe handling of sharp surgical instruments [10,11].

There is a need to report these injuries for proper screening and timely management plan to avoid the risk of health related complications among surgeons. The developing countries like Pakistan, where there are deficient health related facilities, there is lack of efficient system of reporting needle stick injuries. So the aims of current study are to find out the prevalence of

needle stick injury, its reporting system and the reasons behind it.

2. METHODOLOGY

A descriptive cross-sectional study was conducted at Jinnah post-graduate medical center (JPMC) Karachi during the period of March to September 2019. Convenient sampling technique was used. Sample size was calculated by using OpenEpi calculator and was 134. All the juniors and senior doctors including consultants (from senior registrar to above level), post-graduate trainees, house officers and interns, were included in the study.

A self-designed, self-explanatory questionnaire was used, which consist of two parts, the first part was about demographic information while second part is for information related to needle stick injury like probable cause, frequency, response after injury, post-exposure prophylaxis and about reporting of the incident. Questionnaire was validated by calculating the Cronbach's alpha which was 0.78. Data was analyzed by using the Statistical Package for the Social Sciences (SPSS) version 20. All the categorical variables were presented as frequency and percentages.

3. RESULTS

About 134 doctors participated in the study. The response rate was 98%. Majority of the study participants were female (67.2%) and about 50% were postgraduate students followed by house officers. Out of total 134 doctors about 64.2% of the doctors had needle stick injury during their career. Finding out the most probable cause of needle stick injury during the survey it was noted that increased work load and prolonged working hours were the main reasons with frequency of

41% and 28.4% respectively. Majority of the cases occurred in emergency department (41.9%), secondly in the operation theatre (36.8%). After the incidence of needle stick injury, the response of majority of doctors (34.4%) was allowed to bleed from the injury site, 27.6% applied spirit, 19.6% washed with soap/water while only 18.6% didn't take any step. About 95.5% of the doctors didn't get any post-exposure prophylaxis as mentioned in Table 1.

Majority of the participants (96.3%) did not report to any authority, among them 98.5% of the participants reported lack of knowledge about the reporting policy. When finding out the reason for

not reporting, it was noted that about 38.8% were confused either the reporting system exist or not, 25.3% didn't know whom to report while very few only 2.2% were afraid of positive results. Most of the injuries occur during the procedure of suturing followed by recapping syringes, blood sampling, passing cannula, disposing of used needles and very few during handling surgical instruments with frequency of 35.8%, 27.6%, 12.7%, 9.7%, 8.2% and 6% respectively as presented in Table 2. After needle stick injury about 66.4% of the didn't go for viral marker testing while 54.5% checked their HbsAg titer as reported in Table 3.

Table 1. Characteristics of study participants

Variables	n= 134 (%)
Gender	
Male	44 (32.8%)
Female	90 (67.2%)
Designation	
Consultants	23 (17.2%)
Post-graduates	67 (50%)
House officers	38 (28.3%)
Interns	6 (4.5%)
Probable cause	
Increased workload	55 (41%)
Inaccessibility of safety measures	17 (12.7%)
Colleague imprudence	6 (4.5%)
Prolonged working hours	38 (28.4%)
Inadequate light	5 (3.7%)
Lack of Patient's cooperation	9 (6.7%)
Overcrowding in ward	4 (3%)
Incidence per year	
Once	40 (29.7%)
Twice	63 (47.2%)
More than twice	31 (23.1%)
Work place of Needle stick injury	
Operation theatre	49 (36.8%)
Ward	12 (8.7%)
Emergency	56 (41.9%)
ICU	17 (12.6%)
Response after injury	
Nothing	25 (18.6%)
Allow to bleed	46 (34.4%)
Applied spirit	37 (27.6%)
Wash with soap/water	26 (19.4%)
Post-exposure prophylaxis	
Yes	6 (4.5%)
No	128 (95.5%)

Table 2. Reporting status after Needle stick injury

Reported after needle stick injury	
Yes	5 (3.7%)
No	129 (96.3%)
Knowledge of sharp policy	
Yes	2 (1.5%)
No	132 (98.5%)
Reason for not reporting	
Didn't know if system of reporting exist	52 (38.8%)
Didn't know whom to report	34 (25.3%)
Couldn't get time to report	12 (9%)
Didn't bother	21 (15.7%)
Thought of low risk	12 (9%)
Afraid of positive results	3 (2.2%)
Procedure during which injury occur	
Handling surgical instruments	8 (6%)
Suturing	48 (35.8%)
Recapping syringes	37 (27.6%)
Blood sampling	17 (12.7%)
Disposing the used needles	11 (8.2%)
Passing cannula	13 (9.7%)

Table 3. Measures taken after needle stick injury

Viral markers testing	
Yes	45 (33.6%)
No	89 (66.4%)
HbsAg antibody titer	
Yes	73 (54.5%)
No	61 (45.5%)

4. DISCUSSION

Health care workers especially those who are working in the field of Surgery and allied, frequently exposed to needle stick injuries as data presented by Makary's et.al, about 99% of postgraduate residents in surgery have faced the needle stick injuries till they reach to the completion of their training [12]. Literature review revealed that about 96.6% of doctors did not reported for needle stick injuries although its prevalence is very high [13]. There is an increasing prevalence of blood borne infections like HBV, HCV, and HIV in Pakistan [14,15], further increases the risk of transmission through surgical instruments among surgeons and delay in reporting process endanger not only the life of doctor but also increases the risk of secondary transmission [16]. So early diagnosis and treatment is helpful in reduction of the risk of infection like early treatment with anti-retroviral therapy can reduce the risk of HIV infection up to 81% [12] likewise injection of HBV vaccine in case of HBV infection, similar is the case for

HCV, early diagnosis and therapeutic measures can reduce the risk of infection up to 99% in acute cases while 50% in chronic cases [17,18].

Current study reported that the majority of cases of needle stick injury are due to increased work load followed by prolong working hours, which is also favored by other studies reporting accidental needle stick injury due to sense of hurry [13]. Beside prolong working hours, lack of sleep and stress are the other main risk factors [19,20]. Majority of cases occurred in emergency department and secondly in the operation theaters during handling the surgical instruments and the finding are similar to that presented by Berquer et al. [21].

As the current study found that very few of the cases of needle stick injury have been reported due to lack of efficient system of reporting and awareness among doctors about the protective measures and the current findings are consistent with other study in Pakistan, reporting 0.29% prevalence of needle stick injuries among

consultants, 24.5% among post-graduate residents and 44.7% among house officers [22]. There is a need of safety awareness programs including safe methods of passing instruments, use of blunt tip needles, double gloves and gowns. Beside these safety measure, there is also need of a surveillance system to minimize the risk of life threatening infection occurring because of needle stick injuries [21,23].

5. CONCLUSION

It has been concluded that majority of the doctors had faced needle stick injury during their career and a very negligible number of them got any post-exposure prophylaxis. Majority of them did not report to any authority. So there is a need of implication of safety measures and reporting policies for early detection and treatment of infections after needle stick injury.

CONSENT

Informed verbal consent was taken from the participants.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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