SHORT COMMUNICATION

Knowledge, attitudes, and practices of anaesthesia personnel towards needle stick injuries in a tertiary care hospital

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Abstract

The cross-sectional, prospective study was conducted at the Aga Khan University Hospital, Karachi. A questionnaire was distributed amongst anaesthesia personnel, including faculty, residents, medical officers, technicians, recovery room nurses and pain nurses working in the Department of Anaesthesiology for >3 months. Knowledge, attitudes and practices were assessed according to the operational definitions. Of the 162 respondents, 106(65.4%) were males and 56(34.6%) were females. The overall mean age was 31±6.2 years. Adequate knowledge was found in 41(25%) subjects. Overall, 56(35%) respondents reported having had a needle-stick injury, and, among them, 49(87.5%) had a positive attitude. Also, 156(96.3%) participants followed good practices. Although entirely preventable, needle stick injuries were found to be common, indicating the need for proper implementation or revision of existing policies and attainment of safe needle devices.

Keywords: Health knowledge, Attitudes, Practice, Needle stick injuries, Anaesthesia.

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Introduction

Needle stick injury (NSI) in healthcare workers is a global problem. Occupational exposure to percutaneous injuries is a substantial source of infections with bloodborne pathogens among healthcare workers (HCWs). The occurrence of hepatitis B and C among the elective surgical population ranged from 9.8% to 16.4% in different studies conducted in Pakistan.[1]

NSIs in HCWs range from 45% to 77% in different studies conducted in Pakistan.[2] Anaesthesia personnel are exposed to several occupational hazards, including biological hazards. A study in Iran reported that NSI prevalence among anaesthesia personnel was as high as 56.8%.[3]

The current study was planned to determine anaesthesia personnel's knowledge, attitude and practices (KAP) towards NSIs.

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Methods and Results

The cross-sectional study was conducted in the operating theatres (OTs) and post-anaesthesia care unit (PACU) of Aga Khan University Hospital (AKUH), Karachi, from July 2018 to December 2021. The sample was raised using consecutive sampling technique. All anaesthesia personnel, including faculty, residents, medical officers, technicians, recovery room nurses and pain nurses working in the Department of Anaesthesiology for >3 months, were approached. Those not willing to participate were excluded.

Ethical approval was taken from the institutional ethics review committee, and written informed consent was obtained from all the participants who were assured of data confidentiality.

KAP variables were assessed according to the operational definitions. Respondents who gave 50% or more correct answers to knowledge-based questions were considered to have adequate knowledge. A cut-off of 50% was taken for defining a positive response based on answers to attitude and practice-based questions.

The sample size was calculated based on a study reporting that 51% participants were knowledgeable about NSIs.[4] Using the World Health Organisation (WHO) calculator[5] with 8% margin of error and 95% confidence interval (CI), the required sample size was found to be 150.

Data was analysed using SPSS 23. Mean, and standard deviation were estimated for age. Categorical variables, like gender, occupation and work experience, were reported as frequencies and percentages. NSI prevalence was also reported in similar terms. Stratification analysis was performed to control effect modifiers, like age, gender, occupation and experience, to observe effects on KAP and NSI incidence. Chi-square test was used for assessing significance of difference. P≤0.05 was considered significant.

Of the 162 respondents, 106(65.4%) were males and 56(34.6%) were females. The overall mean age was 31±6.2 years. There were 27(16.7%) faculty members, 40(24.7%) residents, 39(24.1%) technicians and 56(34.6%) nurses.

There were 78(48%) respondents with work experience >5 years.

Adequate knowledge was found in 41(25%) subjects. Most participants knew which diseases were transmitted via NSIs, and the reporting time, while knowledge regarding post-exposure prophylaxis was poor (Table 1).

Overall, 56(35%) respondents reported having had an NSI, and, among them, 51(91.1%) had a positive attitude. The highest rate 13(23.2%) of NSI was reported with needle recapping. In 37(66.1%) cases, the HCWs were unaware of the patient's disease status at the time of the injury, 38(67.9%) reported their NSIs, and 30(53.6%) reported their injury to the infectious disease officer.

Further, 156(96.3%) participants followed good practices in terms of having received hepatitis B vaccination, while 110(67.9%) had attended sessions on needle handling, usage and disposal (Table 2).

With respect to professional experience, the participants

Table-1: Responses to questions related to the knowledge and attitude of the subjects

Knowledge Questions	**Right n (%)**	**Wrong n (%)**
Diseases that can be transmitted by needle stick injury	127 (78.4)	35 (21.6)
Risk of transmission of HCV after a needle stick injury	69 (42.6)	93 (57.4)
Risk of transmission of HBV from a patient who is positive for HBeAg after a needle stick injury	52 (32.1)	110 (67.9)
Needle stick injuries reporting time	86 (53.1)	76 (46.9)
Regarding post-exposure prophylaxis of hepatitis B	20 (12.3)	142 (87.7)
Hepatitis B immunoglobulin and first dose of hepatitis B vaccine administration	58 (35.8)	104 (64.2)
Regarding post-exposure prophylaxis of hepatitis C	20 (12.3)	142 (87.7)
Regarding post-exposure prophylaxis of HIV	08 (4.9)	154 (95.1)
Attitude Questions	**Response**	**n (%)**
Have you ever had a needle stick injury?	Yes	56(34.6)
	No	106(65.4)
How many times have you suffered from a needle stick injury within the last one year?	1	21(37.5)
	2	4(7.1)
	>2	7(12.5)
When did you sustain a needle stick injury?	While performing arterial/venous cannulations	8(14.3)
	While drawing a blood sample	4(7.1)
	While injecting medicine (intramuscular/intravenous)	6(10.7)
	After using the needle, before its disposal	11(19.6)
	While recapping the needle	13(23.2)
	At the time of needle disposal	10(17.9)
	During glucose testing via the lancet	2(3.6)
What did you do after having a needle stick injury?	Let it bleed	24(42.9)
	Squeezed the injured area	20(35.7)
	Washed it with soap and water	37(66.1)
	Cleaned the injury with disinfectant	18(32.1)
	Applied occlusive bandage	6(10.7)
Were you aware of the patient's status for hepatitis and HIV?	Yes	19(33.9)
	No	37(66.1)
Did you report your needle stick injury?	Yes	38(67.9)
	No	18(32.1)
If yes, to whom did you report your needle stick injury?	Nursing or Immediate Supervisor	16(28.6)
	Colleague	3(5.3)
	Emergency department	0(0)
	Infection disease officer	30(53.6)
If no, why did you not report your needle stick injury?	I did not know the reporting procedure	2(3.6)
	I did not think it was important to report	1(1.8)
	I thought I might get into trouble for having a needle stick injury	1(1.8)
	I did not have time to report the needle stick injury	3(5.4)
	I was concerned about confidentiality	1(1.8)
	I did not report because the patient's serology was negative	1(1.8)
	Other	3(5.4)
Do you think it is important to report needle stick injury?	Yes	151(93.2)
	No	11(6.8)
Does your hospital have a needle stick injury reporting policy?	Yes	160(98.8)
	No	2(1.2)
Do you know the steps for reporting the needle stick injuries in your hospital?	Yes	143(88.3)
	No	19(11.7)

HBV: Hepatitis B virus, HCV: Hepatitis C virus, HBeAG: Hepatitis B e-Antigen, HIV: Human immunodeficiency virus, IV: Intravenous.

Table-2: Responses to questions exploring the practice of the subjects.

Practices Questions	Response	n (%)
Have you received vaccination for Hepatitis B	Yes	156(96.3)
	No	6(3.7)
Before cannulation, do you make sure that all necessary equipment is available and within arm's reach	Yes	158(97.5)
	No	4(2.5)
Do you use a tray/bin to keep syringes	Yes	162(100)
	No	0(0)
When using needles, do you keep needles pointed away from yourself	Yes	155(95.7)
	No	7(4.3)
Do you always wear gloves while performing IV cannulation	Yes	145(89.5)
	No	17(10.5)
Do you break/bend needles by hand?	Yes	21(13)
	No	141(87)
Do you move around with uncapped needles?	Yes	16(9.9)
	No	146(90.1)
Do you use sharps disposal container	Yes	154(95.1)
	No	8(4.9%)
Have you attended educational sessions on usage, handling and disposal of needles	Yes	110(67.9)
	No	52(32.1)
Do you recap needle after use?	Yes	64(39.5)
	No	98(60.5)
How do you recap a needle after use?	1 handed recap	60(37)
	2 handed recap	26(16)

IV: Intravenous.

were divided into three categories; <1 year, 1-5 years, and >5 years. Work experience and good practices showed no significant association (p=0.125).

There was no significant difference in KAP levels with respect to age and gender Even though there was a higher NSI occurrence amongst males those aged >30 years (p>0.05) Among those with an NSI, nurses and technicians had a better attitude 14(100%) compared to faculty 12(92.3%) and residents 12(75%) (p=0.05). Faculty members 9(33.3%) had better knowledge, but residents 40(100%) followed good practices.

Discussion

In the current study, participants' knowledge regarding post-exposure prophylaxis was minimal. Although this was expected in paramedical staff, residents and consultants could not answer the relevant question correctly. Poor knowledge of post-exposure prophylaxis has been pointed out in previous studies regarding to human immunodeficiency virus (HIV) exposure amongst medical students and HCWs.[6]

Previous studies[7] have noted that nurses suffer from fewer NSIs compared to doctors, and the current results endorsed such findings. However, Sabaa et al. reported contrary findings.[8] In the current study, males seem to be more prone to NSIs than females, which was also observed earlier.[3] A study found that one-third of nursing students suffered NSIs.[9] Surgical team members are more vulnerable to injuries by suture needles.[10]

A study[3] reported that 31% of the respondents did not wear gloves while inserting intravenous (IV) cannulas, whereas in the current study the corresponding value was 11%. Similarly, 55% of the participants recapped needles in the earlier study,[3] whereas the recapping rate was lower in present study. This may be related to using non-recappable cannulas in AKUH OTs.

In a study, only 33% reported NSIs to the relevant authoritiess,[2] while 78% in the current study reported their NSIs. The reasons for not reporting were lack of time, believing that reporting would lead to trouble[11] or because the patient's serology was negative.

Makary et al. reported that the incidence of NSI increased from 1.5% to 7.7 % in the 5th year among the residents.[12] The current study also showed a higher incidence of NSIs in experienced anaesthesia personnel, which may be related to longer duration of exposure to needle per year, careless behaviour and overconfidence as they progress in their career.

The current study has limitations, including a small sample size that may not represent anaesthesia personnel at large. The study was conducted at a private tertiary care hospital that may not represent public-sector hospitals where the situation is entirely different. Further studies are needed to assess the reasons for NSIs to ensure the safety of HCWs, and decrease the burden of disease transmission.

Conclusion

Most anaesthesia personnel were found to have a good attitude, and followed good practices. However, they still lacked adequate knowledge, especially about post-exposure prophylaxis.

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Author Contribution:

ST: Concept, protocol writing, data collection, management, writing.
MH: Conceived idea, final manuscript writing, editing, supervised the project.
SK: Support in protocol writing, editing, supervised the project.
All authors are accountable for all aspects of the work.