INTRODUCTION

Occupational health safety for medical practice is an important issue and Needle stick injury remains the potential source for transmission of blood borne infection and one of the main safety concerns which need to be address for the prevention of various blood borne diseases among HCWs. Reported risk associated with transmission of HBV infection by NSI is about 30%, similarly for HCV and HIV, 10 and 1% respectively.¹

Needle stick injury presents the greatest risk for medical personnel. Most people at risk for occupational exposures are in developing countries where there is paucity of reporting standard protocols.² In addition; HCWs suffer from significant anxiety and emotional distress following a Needle Stick Injury.³

Reported activities related to the majority of NSIs are administering injections, drawing blood, recapping needles, and disposing of needles, handling trash and dirty linen and transferring blood or body fluids from a syringe to a specimen container.⁴ In addition, poor knowledge and practices about the risk and hazards of NSIs substantially contribute the probability of NSIs.⁵

It is estimated that 6–8 million NSIs occur each year in developed countries, like USA and 16 million are reported annually in resource constrain countries.⁶ However, it is being decreased to 3,85,000 annually, due to implementation of multiformal approaches including safer devices.⁷–¹⁰

It is clear that serious consequence of NSIs can be markedly reduces by increasing awareness of safe needle practice. We therefore in this study assessed the knowledge and practice of NSIs among the HCWs. We also identified the various factors associated with knowledge and practice gaps among study participants.

MATERIAL AND METHODS

A cross-sectional study was conducted in two tertiary care teaching hospitals in Karachi, Pakistan. One each hospital represents public and private sector facility. In all, 497 HCWs were participated in this study after giving consent to participate in this study. No ethical issue or harm risk was involved in this questionnaire-based study, nevertheless study protocol and questionnaire was reviewed and approved by departmental research committee. Using a pre-tested and structured questionnaire, interviews were conducted during the months of January–May 2008. The variables of questionnaire include as sex, designation (doctors and nurses), years since practicing and area of practice (medicine and surgery) of study participants. In all, six knowledge related questions and ten practice related questions were included. All the responses were categorized in ‘yes’ and ‘no’ response and takes about 20 minutes to complete the questionnaire.

We analysed the data of 497 HCWs whose information was complete. SPSS-17 was used to enter,
validate and analyse the data. Frequency proportions were calculated for all variables of interest while chi-square test was used for identifying the factors associated with poor knowledge and practices among HCWs.

RESULTS

The majority of the study participants were females (64.2%) and practicing in medical units (62%). Overall, 29.6% HCWs were working for more than five years while there was slight pre-pordance of nurses (52.7%) compared to doctors (47.3%) (Table 1).

Table 1: Basic characteristics of healthcare workers (n=497)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>319</td>
<td>64.2</td>
</tr>
<tr>
<td>Female</td>
<td>178</td>
<td>35.8</td>
</tr>
<tr>
<td>Area of practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicine</td>
<td>308</td>
<td>62</td>
</tr>
<tr>
<td>Surgery</td>
<td>189</td>
<td>38</td>
</tr>
<tr>
<td>Designation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctor</td>
<td>235</td>
<td>47.3</td>
</tr>
<tr>
<td>Nurse</td>
<td>262</td>
<td>52.7</td>
</tr>
<tr>
<td>Years of practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>350</td>
<td>70.4</td>
</tr>
<tr>
<td>≥5</td>
<td>147</td>
<td>29.6</td>
</tr>
</tbody>
</table>

In Table 2, factors associated with knowledge for needle stick injuries among health care workers are described. Overall, small proportion of participants was not aware about the transmission of HBV, HCV and HIV by NSIs; generally more females and those who were working as nurses. In all, 19.1 and 12.3% of respondents had misconception that malaria and tuberculosis can be transmitted by NSI; again more females and nurses and also those who were working in surgical specialty. A huge majority of study participants were not knew that infectious mononucleosis can be transmitted by NSI again more nurses (p<0.001) and those working in surgical units (p<0.001).

Factors associated with practice gaps for needle stick injuries among health care workers are given in Table 3. Overall large numbers of study participants were not screened for HBV and HCV, significantly more females and those working as nurses. Over two-third of HCW were not completed their vaccination against HBV; again more females (p<0.002) and nurses (p<0.001) compared to their counterparts. A huge majority of study participants were not wearing protective cloths and do not us sharp containers. Similarly, pre-pordance of study subjects do not avoid breaking needle by hands and leave syringes open; these poor practices are significantly more prevalent among those working for more than five years and doctors.

Table 2: Factors associated with knowledge for needle stick injuries among healthcare workers

<table>
<thead>
<tr>
<th>Knowledge variables</th>
<th>Overall (%)</th>
<th>Gender</th>
<th>Designation</th>
<th>Area of practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBV cannot be transmitted by NSIs</td>
<td>13.1</td>
<td>3.4</td>
<td>18.5 &lt;0.001</td>
<td>11.4 17.0 0.92</td>
</tr>
<tr>
<td>HCV cannot be transmitted by NSIs</td>
<td>13.3</td>
<td>6.2</td>
<td>17.2 &lt;0.001</td>
<td>14.2 10.9 0.308</td>
</tr>
<tr>
<td>HIV cannot be transmitted by NSIs</td>
<td>11.5</td>
<td>9.6</td>
<td>12.5 0.116</td>
<td>13.7 6.1 0.015</td>
</tr>
<tr>
<td>Malaria can be transmitted by NSIs</td>
<td>19.1</td>
<td>12.4</td>
<td>22.9 0.004</td>
<td>18.0 21.8 0.329</td>
</tr>
<tr>
<td>TB can be transmitted by NSIs</td>
<td>12.3</td>
<td>6.2</td>
<td>15.7 0.002</td>
<td>8.6 21.1 &lt;0.001</td>
</tr>
<tr>
<td>Infectious mononucleosis cannot be transmitted by NSIs</td>
<td>89.3</td>
<td>86.5</td>
<td>90.9 0.128</td>
<td>90.3 87.1 0.290</td>
</tr>
</tbody>
</table>

Table 3: Factors associated with practice gaps for needle stick injuries among healthcare workers

<table>
<thead>
<tr>
<th>Practice variables</th>
<th>Overall (%)</th>
<th>Gender</th>
<th>Designation</th>
<th>Area of practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not screened for HCV</td>
<td>85.5</td>
<td>8.3</td>
<td>88.4 0.014</td>
<td>84.6 87.8 0.357</td>
</tr>
<tr>
<td>Not screened for HBV</td>
<td>55.3</td>
<td>47.2</td>
<td>59.9 0.006</td>
<td>54.6 57.1 0.599</td>
</tr>
<tr>
<td>Not completed HB vaccination</td>
<td>66.8</td>
<td>57.9</td>
<td>71.8 0.002</td>
<td>67.1 66.0 0.803</td>
</tr>
<tr>
<td>Do not use tray to carry syringes</td>
<td>46.5</td>
<td>42.1</td>
<td>48.9 0.147</td>
<td>46.5 51.7 0.130</td>
</tr>
<tr>
<td>Move with uncapped syringes</td>
<td>18.7</td>
<td>24.9</td>
<td>15.4 0.010</td>
<td>15.7 25.9 0.008</td>
</tr>
<tr>
<td>Do not use gloves</td>
<td>28.2</td>
<td>29.2</td>
<td>27.6 0.099</td>
<td>30.0 23.8 0.161</td>
</tr>
<tr>
<td>Do not wear lab coat/proective clothes</td>
<td>80.7</td>
<td>85.6</td>
<td>71.9 &lt;0.001</td>
<td>79.1 84.4 0.179</td>
</tr>
<tr>
<td>Do not use sharp containers</td>
<td>88.3</td>
<td>87.6</td>
<td>88.7 0.021</td>
<td>88.6 87.8 0.796</td>
</tr>
<tr>
<td>Do not avoid to bend or break needle by hand</td>
<td>62.8</td>
<td>61.2</td>
<td>63.6 0.596</td>
<td>56.6 72.8 0.003</td>
</tr>
<tr>
<td>Do not avoid leaving open syringes</td>
<td>55.1</td>
<td>55.8</td>
<td>56.1 0.556</td>
<td>51.7 63.5 0.018</td>
</tr>
</tbody>
</table>

DISCUSSION

In this study, large numbers of participants were aware of transmission of HBC, HCV and HIV. These results endorse other studies from developing countries regarding transmission of these infections by NSIs. Good knowledge level among HCWs reflects the fact that being more chronic and serious infections, dissemination of information about these infections is very common from various platforms by targeting different groups of people including HCWs. However, a big majority of the participants in our study reported that infectious mononucleosis cannot be transmitted by NSIs and small number of HCWs has misconception regarding malaria and tuberculosis transmission by NSIs.

In our study, compared to doctors and males, nursing staff and females had poorer knowledge and practices regarding NSIs. On the other hand, one study from a private hospital indicate that knowledge and practice on bedside while dealing with the patients were highly good in nurses compared to doctors, who strictly...

follow the protective protocols. However, that study had limitation of small sample size and confined to one
tertiary care hospital only.19 Findings of our study are similar
to other studies by Janjua and Gillan where majority of staff nurses were not following universal
precaution during their day-to-day work. These poor
practices were also identified among HCWs who were
working in surgery and allied compared to their
counterparts working in medicine and allied.14,15

As far as use for personal protection was
concerned, 28.2% of health care workers were not
wearing gloves while dealing with the patients. Usage of
gloves was lowest among the nurses compare to
doctors. Around 73% HCWs had poor practice by
moving around with uncapped syringes, and 82% of
HCWs did not use disposal containers and bending/
breaking needle by hand. This kind of practice may be
observed due to increased workload on staff, stress,
carelessness, and overflow of patients in particular at
tertiary care hospitals which are shown in our study that is
consistent with other study in Pakistan.

Two-thirds of our study participants were not
completely vaccinated for HBV and about half of the
participants did not screen for HBV infection. These
findings are very low in comparison to studies from
developed countries like USA and UK.17,18 This contrast
reflects poor accessibility and affordability issue in
developing countries. Similarly, other preventive
facilities were not up-to-mark in hospitals included in
our study. Regular screening and vaccination is mandatory for all HCWs, but it is not possible due to
limited resources in Pakistan. Active surveillance,
analysis of injury data and periodic review for
intervention are important, particularly where workload
and turnover is higher, as in teaching hospitals.19–21

RECOMMENDATIONS

Hospitals and health care facilities should be provided
will all preventive skills and instruments against
infections. Record keeping and reporting of sharp
injuries should be considered as an essential part of
the infectious control actively. Post-exposure prophylaxis
and follow-up facility should be provided by hospital
management. Infectious control training and teaching
should be an integral part of the curriculum of all
disciplines including medical, dental, nursing, and
paramedics. Immunization program should be
mandatory for every employee.

AKNOWLEDGEMENTS

We are thankful to administration and staff of the
hospitals for their permission and support to carry out
this study. We are also thankful to all Healthcare
Workers who participated in this study.

REFERENCES

1. Hsieh W, Chiu N, Lee C, Huang F. Occupational blood and
infectious body fluid exposures in a teaching hospital: a three


3. Wilburn SQ, Eijkemans G. Preventing Needle stick Injuries

4. Lee JM, Botteman MF, Xanthakos N, Nicklasson L. Needlestick
injuries in the United States —epidemiologic, economic and

5. Shen C, Jagger J. Risk of needle stick and sharp object injuries

6. Azap A, Enzongul O, Memikoglu KO, Yesiltayka A, Altunsoy
A, Bozkurt GY, et al. Occupational exposure to blood and body
fluids health care workers in Ankara, Turkey. Am J Infect

7. Taegtmeyer M, Suckling RM, Nguku PM, Meredith C, Kilbaru
J, Chakaya JM, et al. Working with risk: Occupational safety
issues among healthcare workers in Kenya. AIDS Care

8. National Institute for Occupational Safety and Health. NIOSH
Alert. Preventing needle stick injuries in health care settings.
Cincinnati, OH: US Department of Human and Health Services,
Public Health services, Center for Disease Prevention,
National Institute for Occupational Safety and Health; 1999: OH DHSS

9. Needlestick injuries Among Health Care Workers. Available at
Accessed on 19/04/10.

10. Hutton YJ, Hauri AM, Armstrong GL. Use of injection in
health care setting worldwide, 2000 literature review among regional

11. Whitty M, McLawas ML, Slater K. Needle-stick injuries in major
teaching hospitals: worth while effect of hospital-wide
replacement of conventional hollow borne needles. Am J Infect

and practices among health care workers in needle stick injuries.

13. Zafar A, Aslam N, Nasir N, Meraj R, Mehraj V. Knowledge,
attitudes and practices of health care workers regarding needle
stick injuries at a tertiary care hospital in Pakistan. J Pak Med

knowledge: predictor of non-adherence to universal precautions
for blood borne pathogens at first level care facilities in Pakistan.

al. Sharps related injuries in California healthcare facilities: pilot
study results from the Sharps Injury Surveillance Registry. Infect

W. Needle-stick injuries: A survey of doctors working at tertiary

17. Gershon RR, Mitchell C, Sherman MF, Vlahov D, Lears MK,
Feknor S, et al. Hepatitis B vaccination in correctional health

L, et al. European recommendations for the management of
healthcare workers occupationally exposed to hepatitis B virus

19. World Health Organization, Regional Office for South-East Asia
and Regional Office for Western Pacific, SEARO regional
publication no 41 WHO practical guidelines for infection control

20. Bodkin C, Bruce J. Health professionals’ knowledge of
prevention strategies and protocol following percutaneous injury.

21. Chogle NL, Chogle MN, Divatia JV, Dasgupta D. Awareness of
post-exposure prophylaxis guidelines against occupational
exposure to HIV in a Mumbai hospital. Natl Med J India

Address for Correspondence:
Dr. Ameet Kumar, Jinnah Postgraduate Medical Centre, Karachi, Pakistan, Cell: +92-333-3893418
Email: ameetkumar_22@hotmail.com