

# KNOWLEDGE ATTITUDE AND PRACTICES REGARDING NEEDLE STICK INJURIES AMONGST HEALTHCARE PROVIDERS

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## **ABSTRACT**

*Objective:* This study aimed to assess the knowledge, attitude and practices amongst health care workers on needle stick injuries.

*Study Design:* Cross sectional (Knowledge Attitude Practices) study.

*Setting & Duration:* Departments of Holy Family Hospital, Rawalpindi from October to December 2007.

*Methodology:* A 20-item questionnaire was provided to three hundred health care workers including doctors, nurses and paramedical staff from various to assess knowledge, attitude and practices regarding needle stick injuries. Results were calculated on the basis of frequency and percentages using SPSS 15.0.

*Results:* Results showed 282 subjects (94%) had history of needle stick injuries. Healthcare personnel working in surgery department (43.3%) were most frequently affected and the commonest place was Emergency room (42.2%). Hasty work (37.9%) and recapping needles (19.5%) were commonest causes respectively. Only 49% were in the habit of using gloves for phlebotomy procedures. 21.6% were aware of Universal Precaution Guidelines. 16.7% were aware about their immune status after being pricked while 82.7% were vaccinated against hepatitis B.

*Conclusion:* The survey reveals inadequate knowledge amongst health care workers about the risk associated with needle-stick injuries and lack of use of preventive measures. A standard protocol regarding the training as well as adapting preventive measures should be formulated in all health institutions.

**KEY WORDS:** Needle Stick Injuries, Hepatitis B, Hepatitis C, Universal Precaution Guidelines

## **INTRODUCTION**

Increase in the incidence of deadly infections due to greater exposure to micro-organisms and viruses that cause blood-borne diseases, such as the human immunodeficiency virus (HIV) and the Hepatitis B and C viruses, has led the medical community to initiate efforts to prevent and limit exposure among health care workers

(HCW). Through the 1990s, between 600,000 and 800,000 needle stick injuries (NSI) were believed to occur annually - on the order of 2000 every day. As a result, more than 1000 HCW contracted serious blood-borne diseases, such as Hepatitis C or HIV.<sup>1</sup>

Needle stick injury (NSI) means the par literal introduction into the body of healthcare worker, during the performance of their duties, of blood or other potentially hazardous material by a hollow bore needle or sharp instruments, including, but not limited to, needles, lancets, scalpels, and contaminated broken glass.<sup>2</sup>

Potential exposures are not limited to needle sticks alone, because manipulation of other sharp instruments or mucous membrane exposures to infected bodily fluids also can result in the transmission of infectious diseases. Quantifying the precise risk for disease transmission following mucocutaneous exposures is difficult because

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many go unreported. House staff; for example, fail to report between 60% and 95% of exposures.<sup>3</sup> Even though the risk of injury per use is low, so many needles are used in health care settings that even a very low injury rate translates into an imposing number of injuries.<sup>4</sup>

The World Health Organization defines ‘a safe injection’ as one that does not harm the recipient, does not expose the provider to any avoidable risk, and does not result in any waste that is dangerous to the community. Irrational and unsafe injection practices are rife in developing countries.<sup>5</sup> More than 80% of the needle stick injuries can be prevented through the use of safety devices and effective safety programmes.<sup>2</sup> Needle stick injuries can be prevented by applying “Universal precautions” as a safety measure.<sup>6</sup>

**METHODOLOGY**

After taking informed consent, epidemiology of needle stick and sharp injuries was investigated among a cross-section of 300 health care workers including doctors, nurses and paramedical staff: laboratory workers and operation theatre technicians working in various departments of Holy Family Hospital, one of the tertiary level healthcare facility and a teaching hospital of Rawalpindi Medical College, Rawalpindi, Pakistan from October 2007 to December 2007.

A 20-item questionnaire based on Universal precaution guidelines was given to the health care providers. Frequency of needle stick injuries, its causes, the commonest workplace, and department of healthcare personnel, responses after injury, prevention practices, vacci-

nation status and awareness about universal precaution guidelines was assessed.

The data was analyzed in SPSS 15 for frequency and percentages.

**RESULTS**

Three hundred subjects were included in this study amongst those 44.7% (n=134) were doctors, 30.7% (n=92) nurses and 18.7% (n=56) operation theatre technicians and 6% (n=18) laboratory workers.

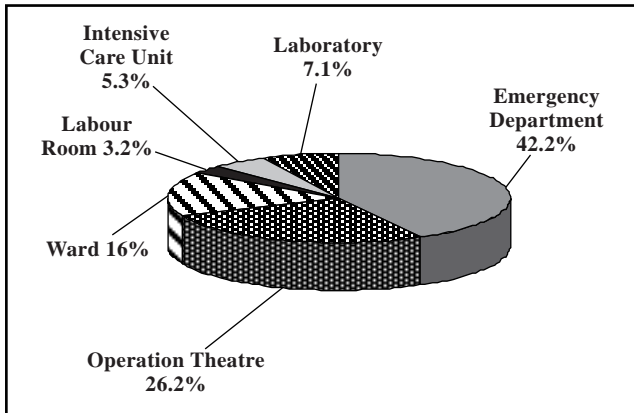
Majority of people question i.e. 73.3% (n=220) were aware about definition of needle stick injuries and the diseases caused by them, out of the total 13.3% (n=40) and 10% (n=30) HCW were unaware of the fact that Hepatitis B and hepatitis C can be transmitted by this route respectively. Only 6% (n=9) HCW were aware about transmission of HIV by this route. 82.7% (n=248) healthcare workers had vaccination against hepatitis B. 94% (n=282) subjects had history of needle stick injuries, in 28.7% (n=86) needle was sterilized, in 38% (n=115) the needle was used while in 27.3% (n=82) needle was blood stained. None of the incidence was reported to the hospital authority.

Healthcare personnel belonging to surgery department, 43.3% (n=130), were most commonly affected followed by those belonging to medical department, 23% (n=69) (Table I).

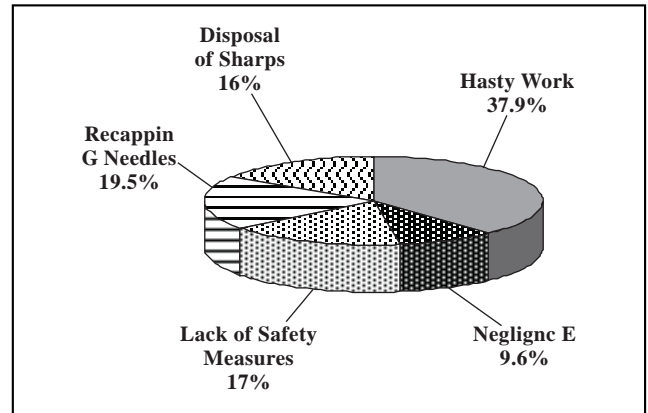
Regarding the commonest workplace where NSI were experienced was emergency department 42.2% followed by operation theatre 26.2%. (Graph 1) Most common

**Table I. Healthcare workers of various departments affected by NSI**

Department	No. of times being pricked				Total
	Once	Twice	Many Times	Never	
Surgery	27	20	83	8	138
Medicine	21	10	38	8	77
Gynae / Obs.	7	6	17	0	30
Anaesthesia	1	0	5	1	7
Orthopaedics	2	1	3	0	66
Neurosurgery	4	3	5	0	12
Pathology	9	4	4	1	18
Eye	2	2	2	0	6
Ent	3	0	3	0	6
<b>Total</b>	<b>76</b>	<b>46</b>	<b>160</b>	<b>18</b>	<b>300</b>



**Graph 1. NSI in Workplace (Healthcare setting)**



**Graph 2. Causes of Needle Stick Injury**

cause for NSI was hasty work 37.9% followed by recapping of needle 19.5% (Graph 2).

Immediate responses reported by HCW after NSI included drawing out blood, washing the pricked site with running water, application of antiseptic solution and pressing the pricked site (Table II). Nearly a quarter of HCW i.e. 24.7% (n=74) got viral serology of the patient on whom the needle was used, 20% (n=60) got their LFTs done and only 16.7% (n=50) HCW got their viral serology done after being pricked. Only 10% (n=30) knew about Post Exposure Prophylaxis (PEP).

When asked about the precautions taken to prevent NSI, all of the HCW used disposable sharps, while 49% (n=147) HCW used gloving for phlebotomies and other such procedures. 46% (n=138) people were aware about proper disposal of sharps. Regarding awareness about universal precaution guidelines only 21.6% (n=65) HCW were found to be aware.

**DISCUSSION**

Occupational Health and Safe medical practice is an

arising issue in developing countries like Pakistan. Needle stick injuries is one such issue that needs to be addressed for preventing various blood borne diseases amongst the health care workers providing their services in various healthcare institutions in Pakistan. Health care providers who have occupational exposure to blood are at increased risk for acquiring blood-borne infections. The level of risk depends on the number of patients with that infection in the health care facility and the precautions the health care workers observe while dealing these patients.<sup>7</sup>

This study showed that 13.3% (n=40) and 10% (n=30) HCW were unaware of the fact that Hepatitis B and Hepatitis C can be transmitted by NSI, as compared to a study conducted by Gurubachariya in Kathmandu which showed that 4% and 61% of health care workers, respectively, were unaware of the same.<sup>8</sup> The risk of transmission after exposure to HIV-infected blood in one of the studies has been highlighted to be about 0.3%, whereas it is estimated to be up to 100 times greater for Hepatitis B virus (30%) and could be as high as 10% for Hepatitis C virus.<sup>9</sup> In 2000, contaminated injections caused an estimated 21 million HBV

**Table II. Immediate response to NSI**

Immediate response to NSI	Frequency	
Drawing out blood from pricked site	Yes	87.9%
	No	12.1%
Washing the site from running water	Yes	89.4%
	No	10.6%
Washing the site from antiseptic	Yes	76.6%
	No	23.4%
Pressing the site being pricked	Yes	79.4%
	No	20.6%

infections, two million HCV infections and 260,000 HIV infections, accounting for 32%, 40% and 5% respectively of new infections.<sup>10</sup>

The subjects in this study who had history of NSI is 94% (n=282) which is very high as compared to such studies conducted at various centers in Khatmandu<sup>8</sup> and Japan<sup>11</sup> though none of the incidence was reported to the hospital authority. In a study conducted in USA, about half of all injuries were never reported to the employee health service, although residents did report 84% of injuries associated with high-risk patients. Lack of time was listed as the major reason for failing to report the injury.<sup>12</sup> In this study HCW vaccinated against Hepatitis were 82.7%. While in a study at a hospital in Dublin, 41% HCW were Hepatitis B immune.<sup>13</sup>

HCW belonging to surgery department were the most commonly affected by NSI due to the increased exposure to sharps while working in elective and emergency operation theatre, emergency room as well as the out patient department, while the commonest workplace was emergency department most probably due to a huge number of patients creating a lot of load on HCW indulging them in unsafe medical practices. In a study conducted in Italy, nurses were most commonly affected by NSI<sup>14</sup> and a study conducted in Scotland showed wards to be the commonest workplace.<sup>15</sup> Several reasons have been picked as a causative factor for such injuries (Graph 2). In this study hasty work (37.9%) followed by recapping needles (19.5%) are of prime importance. Other causes in order of frequency include lack of safety measures (17%), during sharp disposal (16%) and negligence (9.6%). According to Centre of Disease Control, manipulate needle inpatient (26%), injury sustained during sharp disposal (13%) were major causes while recapping needle accounted for 6% of such injuries.<sup>16</sup>

One of the important aspect is related to the immune status of the person on whom the needle was used and the result of our study show that only 24.7% (n=74) HCW got viral serology of the patient on whom the needle was used. This is equivalent to a study in Dublin where 23% were aware about immune status of the patient.<sup>13</sup> With a figure of 94% who have been exposed to NSI, only 16.6% are aware about their immune status after sustaining NSI which is less as compared to a study by Gurubachariya in Kathmandu where 23% HCW got their viral serology done after exposure to NSI.<sup>8</sup>

Another important issue of the study was awareness regarding post exposure prophylaxis which was found to be only 10% (n=30). Further work should be done regarding PEP to make more and more HCW aware of

it who deal with the sharps. In a study conducted at Armed Forces Hospital, Sarourah, 93% HCW were unaware about PEP.<sup>17</sup> Hepatitis B immunization and post exposure management are integral components of a complete program to prevent infection following blood borne pathogen exposure and are important elements of workplace safety.<sup>18</sup> Since 1994, when the Advisory Committee on Immunization Practices (ACIP) reviewed available data regarding the prevention of HCV infection with immunoglobulin (Ig) and concluded that using Ig as PEP for hepatitis C does not show good results, more and more work is being done regarding the use of Ig.<sup>19</sup> The U.S. Public Health Service (PHS) published guidelines for the management of HIV exposures that included considerations for post exposure prophylaxis (PEP).<sup>20-22</sup>

Regarding post exposure actions, 89.4% HCW in this study washed the wound with running water, 89.4% drew blood from site being pricked and 76.6% applied antiseptic solution on it which is comparable to the response by medical students after NSI as shown by the study conducted by Patrick Cervin in University of Toronto which shows that 87% medical students washed wound with water and antiseptic solution.<sup>23</sup>

When asked about safe work practices, only 49% people used gloving for phlebotomy procedures. While a study conducted by Gurubachariya in Kathmandu 23% HCW were in the habit of using gloves for phlebotomy procedures all the time.<sup>8</sup>

Another important aspect was awareness related to safe medical practices regarding NSI i.e. Universal precaution guidelines which in this study was found to be only 21.6% (n=65) which is comparatively very low when we compare data from various countries. In a survey at Armed Forces Hospital, Sarourah, 61% HCW were aware about the Universal precaution guidelines.<sup>17</sup> In order to increase awareness amongst health care workers of the dangers of sharp injuries and other types of disease transmission, the Centers for Disease Control (CDC) and the Occupational Safety and Health Administration (OSHA) in 1985, in United States introduced the "Universal Precaution Guidelines," which have become the worldwide standard in both hospital and community care settings.<sup>24</sup> Universal precautions, which in reality is the set of work practice recommendations designed to help minimize occupational exposure to blood borne pathogens, have been shown to be very effective.<sup>25</sup>

## CONCLUSION

This study reveals that:

- Knowledge among health care workers regarding



- risks and hazards associated with NSI is inadequate.
- HCW belonging to surgical department are the commonest victims of NSI and the emergency room is the commonest workplace.
- Awareness about Universal precaution guidelines and its implementation is not up to the mark in healthcare facility.

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