Safe Injection Practices and Awareness among Health Care Workers in Tertiary Level Hospitals Kathmandu, Nepal

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ABSTRACT

Background: People receiving and providing health and medical care including the injections, whether in hospital or clinic, are at risk of becoming infected unless precautions are taken to prevent infections. A safe injection is one that does not harm the recipients, does not expose the provider to any avoidable risk, and does not result in waste that is dangerous to other people. This study was done to assess injection practices and awareness among the health care workers in tertiary level public hospitals of Kathmandu district in Nepal.

Methods: This was an institutional based descriptive cross-sectional study. From the tertiary level public hospitals of Kathmandu in Nepal, 118 health care workers were selected to study on the basis of 9.8 per cent prevalence of blood borne diseases in the least developed African countries. Bir Hospital, Kanti Children Hospital, Maternity Hospital, Shukraraj Tropical and Infectious Disease Hospital and Gangala Heart Center were selected purposively and the required number of health care workers was selected proportionately from each hospital. Respondents were those present in their duty hours.

Results: Approximately 50 per cent health care workers were injured within last one year, out of them 0.8 per cent were infected from hepatitis B virus. They treated their injuries with antiseptics and they never had followed up post exposure procedures. Only 4.2 per cent health workers used sterile gloves during risk activities. Before starting care of patients, 19.5 per cent health workers washed their hands with detergent but the proportion of hand washing after activities was higher (71.2%). 97.5 per cent respondents did not follow recommended technique to clean the injecting sites, whereas, 69.5 per cent used prescribed sites for injections. All the health care workers used disposal needles and syringes and they never bent used needles.

Conclusion: The knowledge and practice level of the health care workers was very much different. Nursing Staff had higher knowledge than the laboratory Staff. But there was not found comparable differences between them in practices. The higher proportion (76.3%) of health care workers did not have refresher trainings on infection prevention.

Key words: blood-borne diseases; infection prevention; needle stick injury; universal precaution

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INTRODUCTION

Nosocomial (hospital acquired) infection is a significant health problem throughout the world. It ranges from as low as one per cent to as high as forty per cent. Health care workers and other supportive staff are at risk of life-threatening infections, such as hepatitis B, hepatitis C and others. Health care workers are at risk to blood-borne infections due to occupational exposure.[1]

The level of risk depends upon types of infections and adopted precautions by the health care workers. There are more than twenty blood-borne diseases of which hepatitis B, hepatitis C and HIV/AIDS are primary significance to health care workers. The prevalence of hepatitis surface agent (HBsAg) is 1.67 per cent, positive anti-hepatitis - C virus (HCV) 0.3 per cent and HIV sero-positive about 0.2 per cent among the general blood donors in Kathmandu Valley.[2] There was a 9.8 per cent prevalence of blood-borne diseases among the health care workers in some African countries. These diseases were transmitted from patients to health care workers because the unsafe injection practices in the health care settings of the developing countries.[3]

METHODS

The present study was an institutional based cross-sectional descriptive study. There were altogether 625 non-officer level nursing and laboratory staff working in tertiary level public hospitals of Kathmandu district in Nepal. From the total Staff, 118 staff were selected to study on the basis of 9.8 per cent prevalence of blood borne diseases in the least developed African countries. The basic qualification of the respondents were auxiliary nurse midwife training, proficiency certificate level in nursing, laboratory assistant training and proficiency certificate level in laboratory science. All the tertiary level public hospitals of the Kathmandu district were selected purposively and the required number of health care workers was selected proportionately from each hospital. Respondents were those were present in their duty hours. Baseline data were collected by using questionnaire and observation checklist. Before conducting this research, consent was taken from respondents and hospitals. The period of the data collection was 1st January to 28th February 2007. The collected data were analyzed and interpreted by using Statistical Package of Social Sciences (SPSS).

RESULTS

Our result shows that 88.98 per cent of the respondents were involved in this study were females (Table 1). The mean age (standard deviation -7.82) of the respondents was 28.70 year. The majority, 61.02 per cent employees were between 21 to 30 years.

More than fifty per cent respondents had knowledge of universal precaution, risk minimization procedure during injection practices, protection of blood borne disease, hand washing for infection prevention, proper disposal of used syringes and needles, proper use of gloves, importance of infection control, decontamination and sterilization process, laboratory acquired infection, sharp management into recommended containers, causes of infection to health care workers in health care settings, blood borne hepatitis, protection of health workers and patients and importance of glove usage (Table 2).

It is seen that 50.58 per cent health care workers were injured by needle sticks within a year (Table 3). The occurrence of needle stick injury was higher among the nursing staff than laboratory staff.

All the respondents used disposable syringes and needles, and they never bent the used needle (Table 4). Hand washing after activities, cleaning injecting areas with antiseptic/ microcides, recapping of needles, usage of puncture proof box to dispose needles and syringes, usage of disposable containers to dispose other than needles and syringes, usage of prescribed sites for injection, use of non-touch technique during injection practices were followed by more than half of the respondents.

The table-5 indicates that 76.27 per cent health care workers followed non-touch technique during injection practices. The percentage of the nursing Staff was higher (81.83%) than the percentage of the laboratory Staff (35.11%).

DISCUSSION

A study in Kathmandu valley had involved only nursing staff whereas in this study researcher had compared

Table1. Age and sex status of respondents

Sex of Respondents	<20 years		21 to 30 years		31 to 40 years		40>years		Total	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Male	0	0.00	4	3.39	7	5.93	2	1.69	13	11.02
Female	2	1.69	68	57.63	24	20.34	11	9.32	115	88.98
Total	2	1.69	72	61.02	31	26.27	13	11.02	118	100.00

Table2. Awareness status of the respondents				
Selected variables	Yes (%)	No (%)	No idea (%)	Total
Employee immunization against hepatitis B	46(39.0)	66(55.9)	6(5.1)	118
Use of protective measure (IM injection)	10(8.5)	106(89.8)	2(1.7)	118
Universal precaution	93(78.8)	22(18.6)	3(205)	118
Risk minimization procedure during injection practices	59(50.00)	58(49.2)	1(0.8)	118
Protection against blood borne diseases	89(75.4)	29(24.6)	0 (0.00)	118
Hand washing for infection prevention	86(72.9)	32(27.1)	0(0.00)	118
Disposal of used syringes and needles	75(63.6)	42(35.6)	1(0.8)	118
Proper use of gloves	78(66.1)	31(26.3)	9(7.6)	118
Importance of infection prevention	107(90.7)	10(8.5)	1(0.8)	118
Antisepsis	43(36.4)	74(62.7)	1(0.8)	118
Decontamination	61(51.7)	54(45.8)	3(2.5)	118
Sterilization	102(86.4)	16(13.6)	0	118
Laboratory acquired infection	65(55.08)	38(32.2)	15(12.8)	118
Sharp management in recommended containers	85(72.0)	25(21.2)	8(6.8)	118
Chemical and biological waste management.	19(16.1)	66(55.9)	33(28.0)	118
Infection to health care workers in health care settings	108(91.5)	8(6.8)	2(1.6)	118
Blood borne hepatitis	69(58.5)	41(34.7)	8(6.8)	118
Protection of health workers and patients	77(65.3)	34(28.8)	7(5.9)	118
Importance of glove usage	74(62.7)	34(28.7)	10(8.5)	118

Note: The figures in the parenthesis indicate percentage.

Table 3. Magnitude of needle sticks injuries among health care workers					
Post	yes		No		Total
	No.	Percent	Freq.	Percent	No.
Nursing	54	51.92	50	48.08	104
Lab. Staff	6	42.86	8	57.14	14
Total	60	50.58	58	49.15	118

knowledge and practices regarding infection prevention of nursing staff with laboratory staff.[2] The knowledge and practices of the respondents was analyzed on the basis of their job experience and knowledge gained during infection prevention trainings. The majority of the respondents (48.31%) had an experience of 0-4 years whereas 76.3 per cent of the health care workers did not have further infection prevention refresher trainings.

This study showed that only 39.00 per cent respondents had a got correct knowledge about importance of immunization and approximately 40 per cent of the respondents did not have knowledge about the blood borne hepatitis diseases. This reflects the importance of careful and efficient immunization for employees.

A study had showed that only 23 per cent nursing staff used gloves regularly in their duty.[2] The findings of this study also showed that only 8.5 per cent of the health care workers had got correct knowledge towards appropriate usage of gloves during intramuscular and intravenous injecting activities and only 4.2 per cent of the healthcare workers used gloves during vein puncture or intravenous injecting and to handle the soiled linen/ instruments/ specimens.

Approximately fifty per cent health care workers had the knowledge of risk minimization of patient and healthcare workers from blood borne infections such as hepatitis B, hepatitis C and HIV/AIDS etc. and the study also showed that in an average 68.33 per cent of the nursing staff had also the knowledge of risk minimization from blood borne diseases such as hepatitis B, hepatitis C and HIV/ AIDS.[2] So the findings of both studies were very close. A study (Hitesh et al, 2006) In Assam India showed different results, 97 per cent of the nursing students perceived themselves at risk of accidental exposure.[4]

Approximately seventy five per cent health workers had got knowledge about prevention of blood-borne diseases but 95.80 per cent did not use essential protective measures such as sterile gloves during vein puncture or

Table 4. Activities of health care workers during injection practices (Based on observation)

Activities	Yes		No		Total
	No.	Per cent	No.	Per cent	
Hand washing before activities	23	19.5	95	80.5	118
Hand washing after activities	84	71.2	34	28.8	118
Used disposal syringe	118	100.00	0	0	118
Cleaning injecting areas with antiseptic/ microcides	116	98.3	2	1.7	118
Followed recommended antisepsis procedure (Centre to outward)	3	2.5	115	97.5	118
Recapping of needles done	113	95.8	5	4.2	118
Bending of needle done	118	100.00	0	0	118
Reuse of same needle for subsequent injections.	105	89.00	13	11.00	118
Usage of puncture proof box to dispose needle and syringe	102	86.4	16	13.6	118
Disposal of the syringes and needles in recommended container	27	22.9	91	77.1	118
Used disposal container to dispose other than needle-syringe	99	83.9	19	16.1	118
Touched tip of open vials /ampoules/Needles	25	21.2	92	78.8	118
Use of non-touch technique during injection practices	91	77.1	27	22.9	118
Use prescribed site for injection	82	69.5	36	30.5	118
Used sterile or disposable gloves during Vein puncture or IV Injecting	5	4.2	113	95.8	118
Used sterile or disposable gloves to handle the soiled instruments/ specimens	5	4.2	113	95.8	118

Table 5. Practiced non-touch technique during injection practices

Post	ves		No		Total
	No.	Per cent	No.	Per cent	
Nursing	85	81.83	19	18.27	104
Lab. Staff	5	35.11	9	64.29	14
Total	90	76.27	28	23.73	118

P <0.05

intravenous injecting and to handle the soiled linen/ instruments/ specimens etc. Similarly seventy eight per cent of the respondents had knowledge about universal precaution but practice level was seen far below from the knowledge level which reflects the gap between the knowledge and practice level of the respondents.

The findings of this study showed that hundred per cent of the health care workers had used disposable needles and syringe and they had never bended the used needles but 95.8 per cent health workers had recapped the used needles before disposing it off. Forty four per cent health care workers were aware about the different recommended containers for waste disposal. But the waste was not thrown in the recommended containers. The study had found that most of the participants (96%) used the standard method for waste disposal. But this study showed that only 22.9 per cent health care workers disposed the used needle and syringes into recommended containers.[4]

Approximately ninety one per cent health care workers were aware towards the infection of health care workers in health care settings and 58.17 per cent health care workers had got the correct knowledge of infection prevention processes such as antisepsis, decontamination and sterilization. A study highlighted that unsafe injection practices may be due to lack of knowledge, shortage of sterile supplies, or absence of disposal facilities so the irresponsible use of injections must be curtailed.[5] The emphasis of that study and the findings of this study are very close each others.

The occurrences of needle injuries among the health care workers were 50.8 per cent. The average number of injuries per health care worker was 2.34 per year. The study done among the health care workers in West Bengal showed that 61.40 per cent of the health care workers sustained needle stick injuries during the past one year and among them the average number of injuries was 5.34 per year, 77.14 per cent of them had received injuries during or after the procedures involved.[6] These two studies have a similar pattern in terms of occurrence of needle injuries but episode of needle injuries is seen higher in West Bengal than Kathmandu.

Among the causation of needle stick injury, 78.3 per cent health workers reported accidental cause as the major

cause of needle stick injury. This type of accidental injury may occur everywhere so, to minimize the risk of needle stick injury the availability of protective measures and professional training can play an important role.

Approximately seventy eight per cent health care workers had treated their injuries with antiseptic and they did not consider the post exposure follow up procedures to confirm the blood borne disease infections. A study emphasized that a major proportion of injections administered in India are unsafe. Un-safety is due to: steps that are associated with increased risk of spread of blood borne viruses and errors related to technique of injection and faulty habits. For minimizing the risk of needle stick injury recommendations of Indian Academy of Pediatrics revolve round the following points: Equipment related, safe injection practices, best injection techniques, rational injection practices, prevention of needle stick injuries and reducing disease transmission recommendation for HIV-PEP (post-exposure prophylaxis), HBV-PEP, disposal of syringes and sharps [7]. But in this study 91.5 per cent respondents had reported that there was no available facilities for post exposure follow up in the hospitals.

The study found out that, 0.8 per cent health care workers were infected from blood borne infection: hepatitis B virus within a year. A study showed that in the developing countries, the risks of transmission of infection from infected patients to the health care workers following a needle stick injury were: Hepatitis B 3-10 per cent, Hepatitis C three percent and HIV 0.3 per cent. Factors that increased risks of transmission of HIV include a deep wound, visible blood on the device, a hollow-bore blood-filled needle, use of the device to access an artery or vein, and high-viral-load status of the patient. Taken together, these factors can increase the risk of transmission of HIV from a contaminated sharp to 5 per cent. In developing countries, the risk of occupational transmission is increased by the excessive handling of contaminated syringes.[3] A study emphasized that unsafe and unnecessary therapeutic injections and the high prevalence of HBV (8.0%), HCV (6.5%), and HIV (2.6%) infection in Cambodia have raised concern over injection safety. To estimate the magnitude and patterns of such practices, a rapid assessment of injection practices was conducted.[8]

Approximately sixty one per cent respondents reported that the hospital authority was not responsible towards the health hazards of their employees. Likewise, 71.19 per cent respondents said that there was no provision for HBV vaccine immunization to employees in their hospitals. Employees who were not immunized from their hospitals, 75 per cent had taken vaccine on their own and the rest 25 per cent remained to be immunized against HBV. This study reveals the variation in the knowledge level among the health care workers. The knowledge level of nursing Staff was higher than the laboratory Staff.

Regarding the practice level they had an overall similar performance. In conclusion: the practice level of the healthcare workers was far lower than the knowledge level, which reflects the gap between the knowledge and actual practices. The hospital should provide infection prevention training to all the Staff, coordinating with government and others NGOs and INGOs. Hospitals should develop operational guideline regarding supply and usage of protective measures and implement it strictly. The hospital should manage recommended containers and encourage to the health workers to use assigned containers. Hospital authority should provide follow up service to all the injured Staff. Hospital should develop Internal Act regarding the health hazards of employees. Further Research should be conducted regarding the Knowledge, attitude and risk perception among the nursing students with accidental needle stick injury and Knowledge, attitude and behavior regarding safe injection among medical students.

CONCLUSIONS

The knowledge and practice level of the health care workers was very much different. Nursing Staff had higher knowledge than the laboratory Staff. But there was not found comparable differences between them in practices. The higher proportion (76.3%) of health care workers did not have refresher trainings on infection prevention. Likewise, 71.19 per cent respondents have not had facility of immunization against hepatitis B infection in hospitals whereas they were employed.

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