

Knowledge on occupational exposures and Post Exposure Prophylaxis (PEP) for HIV among Health Care Workers (HCW) in Kegalle District, Sri Lanka

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Abstract

Introduction: Health care workers are at a high risk of exposure to blood borne infections including HIV. Therefore, correct and updated knowledge on occupational exposure (OE) and PEP among HCW is mandatory.

Objective: The objective of this study was to assess the knowledge on occupational exposures and PEP for HIV among HCW in Kegalle District, Sri Lanka

Method: A descriptive cross sectional study was carried out using proportionate quota sampling among 470 HCWs in 4 major hospitals in Kegalle District. Self-administered questionnaire was used to extract data.

Results: Overall, 82.3% had above satisfactory level of knowledge while 19% of them had good knowledge. Nurses were more knowledgeable compared to other categories ($p=0.0001$). Level of knowledge increased with the service period up to 10 years and then declined. More than half (53%) ever had occupational injury during their working life but only 17% had gone to STD clinic for PEP counselling. Majority (82%) knew the correct timing of initiating PEP but only 34% knew the correct duration of PEP. Only 43% knew that HCW should attend the STD clinic for PEP management. Hep B infection was identified only by 1/3 as having the highest risk of transmission through blood. Only 62% knew about the availability of PEP circular.

Conclusions: Knowledge of HCW on OE and PEP was satisfactory but there were some gaps in knowledge. Importance of starting PEP within 24 hours and continuing for 28 days when recommended should be emphasized.

Key words: Health Care workers, Occupational Exposure, Post Exposure Prophylaxis

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Full article

Introduction

Health care workers are at a high risk for exposure to infections such as HIV, Hepatitis B and C as they expose themselves to blood and body fluids while working in the health care settings. Percutaneous injuries with needles or sharp objects, contact of mucous membranes and non-intact skin to blood or body fluids (semen, vaginal secretions, and cerebrospinal fluid, synovial, pericardial, peritoneal and amniotic fluid) and human bites are considered as 4 types of high risk occupational exposures (OE) while exposure to normal skin poses no risk. (1)

Taking measures to prevent occupational exposures by adopting standard precautions is the primary means of prevention, but in the meantime, appropriate Post Exposure Prophylaxis (PEP) is also important in a situation of an unexpected occupational injury. There are effective Antiretroviral drugs which are used as PEP to prevent HIV infection after high risk exposure. (2,3) Thus health care workers must be aware of what is a risky occupational exposure, what to do next when exposure happens, whom to inform, where to go for assessment and prophylactic treatment. Therefore, correct and updated knowledge about PEP among HCW is mandatory.

Health Department issued general circulars in 2001 and 2017 (update) regarding the management of occupational exposures to HIV in healthcare settings. (4,5) However, the instructions outlined in the circulars are not being followed by HCWs (6) due to lack of knowledge about the procedure to be followed and sometimes even the existence of such circulars.

Therefore, this study is designed to assess the knowledge in PEP among HCW in Kegalle district. This will enable us to identify the gaps in knowledge and to correct them, enabling HCW in the district to get an effective PEP

Method

For the study, HCW was defined as a person performing work in a hospital who has potential of exposing him/herself to infectious clinical material. A descriptive cross sectional study was done among HCWs in main 4 hospitals in Kegalle District, namely

1. District General Hospital Kegalle
2. Base hospital, Karawanella
3. Base hospital, Mawanella
4. Base hospital, Warakapola.

HCWs belong to 6 categories; doctors, nurses, midwives, laboratory technicians, minor staff and janitorial workers who were working at the period of study were selected. The study was carried out from 01/07/2017 to 31/09/2017. Total of 470 HCWs were selected adopting proportionate quota sampling allowing proportional representation from all selected working categories. (Table 1)

Table 1. Distribution of the study subjects

	DOC	NO	MLT	PHM	Min	JW	Total
Kegalle	47	95	4	8	35	15	240
Karawanella	13	31	5	3	28	4	84
Mawanella	21	30	2	14	26	18	111
Warakapola	8	30	4	5	24	0	71
Total	89	186	15	30	113	37	470

DOC-Doctors, NO-Nursing officers, MLT-Medical laboratory technologist, Min-Minor staff, JW-Janitorial workers

Well-structured, self-administered questionnaire used as the data collection tool. Questionnaire included the questions on occupational exposures, first aid and protocol following an OE. Infection control nurses were trained in 4 hospitals to assist the data collection while Principal Investigator (PI) and Co investigators were available for any clarifications. Data were analyzed using SPSS.21.

Results

Socio-demographic data

The study sample mainly consisted of females (82%) while the mean age of the sample was 40.7 years. Other socio-demographic data are given below

Table 2. Socio-demographic data of study units

Variable	Levels	Freq	Percent(%)
Age categories	≤25 yrs	8	1.7
	25-34 yrs	125	26.6
	≥35 yrs	337	71.7
	Total	470	100
Marital Status	single	54	11.5
	married	400	84.9
	divorced	5	1.1
	separated	10	2.1
	widowed	1	.2
	Total	470	100
Level of education	Primary	11	2.3
	grade 6-10	20	4.3
	completed O/L	73	15.5
	completed A/L	238	50.6
	completed degree	86	18.3
	completed higher diploma/degree	42	8.9
	Total	470	100
Experience as a healthcare worker	< 1 year	16	3.4
	1-5 years	90	19.1
	5-10	120	25.5
	10-15	90	19.1
	15-20	63	13.4
	>20 years	91	19.4
	Total	470	100.

Occupational exposures by HCWs

More than half of the sample (53%) had a risky OE. However, only 17% of them had gone for PEP counseling services following injury. Only 18.5% participated in an education session on PEP within previous year. (Table 3)

Table 3: Occupational Exposures by HCWs

Variable	Levels	Freq	Percent (%)
Had occupational exposure ever	yes	248	53.0
	no	220	47.0
	Total	468 ¹	100.0
Attended for PEP counselling	yes	42	17.2
	no	202	82.8
	total	244 ²	100
Participated in PEP awareness programme	yes	85	18.5
	no	374	81.5
	Total	459 ⁴	100.0

¹ missing values (N=2), ² denominator –who had OE missing values (N = 4), ³ missing values (N = 3), ⁴ missing values (N = 11)

As a designation nurses were the highest to get OE (46%) as well as highest (59%) to gone for PEP counseling. Furthermore, they were the highest (48%) to attend for PEP education session. (Table 5)

Table 5: Occupational Exposures by Designation

Variable	D	NO	MLT	PHM	Min	JW	Total
Had OE ever	61 (24.6%)	116 (46.8%)	2(0.8%)	12(4.8%)	37(14.9%)	20(8.1%)	248(100%)
PEP counselling after OE	10(23.8%)	25(59.5%)	0(0%)	2(4.7%)	5(12%)	0(0%)	42(100%)
Participated awareness session	11(12.9%)	41(48.2%)	0(0%)	3(3.5%)	12(14.1%)	18(21.2%)	85(100%)

DOC-Doctors, NO-Nursing officers, MLT-Medical laboratory technologist, Min-Minor staff, JW-Janitorial workers

Knowledge on risky occupational exposures, first-aid and blood born viruses

HCWs knowledge on risky occupational exposures, first-aid after OE and blood born viruses are given in table 06.

Table O6 –Knowledge on risky occupational exposures, first aid and blood born viruses

Variable level	DOC	NO	MLT	PHM	Min	JW	Total
	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)
Select the injury with no risk for HIV/blood born infections							
Splash to eye	0 (0.0%)	1 (0.5%)	0 (0.0%)	0 (0.0%)	2 (1.8%)	2 (5.7%)	5 (1.1%)
Needle prick	1 (1.1%)	1 (0.5%)	0 (0.0%)	0 (0.0%)	7 (6.4%)	3 (8.6%)	12 (2.6%)
Contact with healthy skin	84 (96.6%)	173 (94%)	14 (93.3%)	28 (93.3%)	88 (80.0%)	26 (74.3%)	413 (89.6%)
Contact with unhealthy skin	2 (2.3%)	4 (2.2%)	1 (6.7%)	1 (3.3%)	4 (3.6%)	2 (5.7%)	14 (3%)
human bite from a patient	0 (0.0%)	4 (2.2%)	0 (0.0%)	1 (3.3%)	8 (7.3%)	1 (2.9%)	14 (3.0%)
total	87 (100%)	184 (100%)	15 (100%)	30 (100%)	110 (100%)	35 (100%)	461¹ (100%)
What is the infection with highest risk of acquisition after a needle prick?							
HIV	2 (2.2%)	12 (6.6%)	1 (6.7%)	3 (10.0%)	65 (58.6%)	29 (78.4%)	112 (24.2%)
Hepatitis B	36 (40.4%)	98 (54.1%)	7 (46.7%)	5 (16.7%)	18 (16.2%)	0 (0.0%)	164 (35.4%)
Hepatitis C	1 (1.1%)	4 (2.2%)	2 (13.3%)	0 (0.0%)	5 (4.5%)	0 (0.0%)	12 (2.6%)
All 3 of above	50 (56.2%)	66 (36.5%)	5 (33.3%)	22 (73.3%)	23 (20.7%)	8 (21.6%)	174 (37.6%)
Don't know the answer	0 (0.0%)	1 (0.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (0.2%)
Total	89 (100%)	181 (100%)	15 (100%)	30 (100%)	111 (100%)	37 (100%)	463² (100%)
Select the correct statement on Hepatitis B infection							
Can be prevented by vaccine	84 (97.7%)	160 (89.4%)	13 (86.7%)	25 (86.2%)	96 (86.5%)	27 (77.1%)	405 (89.0%)
Transmission risk is less than HIV	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (3.4%)	4 (3.6%)	3 (8.6%)	8 (1.8%)
Not transmitted through blood	0 (0.0%)	2 (1.1%)	0 (0.0%)	0 (0.0%)	2 (1.8%)	0 (0.0%)	4 (0.9%)
No treatment is available for Hep B infection	2 (2.3%)	16 (8.9%)	2 (13.3%)	3 (10.3%)	9 (8.1%)	5 (14.3%)	37 (8.1%)
Total	86 (100%)	179 (100%)	15 (100%)	29 (100%)	111 (100%)	35 (100%)	455³ (100%)
Select the correct statement on Hepatitis C infection							
No vaccine is available for prevention of Hep C	46 (62.2%)	118 (67.4%)	2 (13.3%)	12 (46.2%)	23 (24.0%)	9 (25.7%)	210 (49.9%)
Transmission risk is less than HIV	8 (10.8%)	20 (11.4%)	2 (13.3%)	2 (7.7%)	12 (12.5%)	13 (37.1%)	52 (13.5%)
Not transmitted through blood	6 (8.1%)	19 (10.9%)	10 (66.7%)	5 (19.2%)	42 (43.8%)	6 (17.1%)	88 (20.9%)
No treatment is available for Hep C infection	14 (18.9%)	18 (10.3%)	1 (6.7%)	7 (26.9%)	19 (19.8%)	7 (20%)	66 (15.7%)
Total	74 (100%)	175 (100%)	15 (100%)	26 (100%)	96 (100%)	35 (100%)	421⁴ (100%)
What do you do immediately after needle prick injury?							
Squeeze the blood from the wound	7 (7.9%)	8 (4.3%)	3 (20.0%)	3 (10.0%)	20 (17.7%)	19 (51.4%)	60 (12.8%)
Wash the injury site with running water	60 (67.4%)	147 (79.0%)	10 (66.7%)	19 (63.3%)	72 (63.7%)	9 (24.3%)	317 (67.4%)
Wash the injury site with betadine or surgical spirit	14 (15.7%)	4 (2.2%)	0 (0.0%)	3 (10.0%)	6 (5.3%)	1 (2.7%)	28 (6%)
Inform infection control unit	4 (4.5%)	2 (1.1%)	2 (13.3%)	2 (6.7%)	12 (10.6%)	7 (18.9%)	29 (6.2%)
Not answered	0 (0.0%)	18 (9.7%)	1 (0.9%)	1 (0.9%)	1 (0.9%)	0 (100%)	22 (5.0%)
Total	89 (100%)	186 (100%)	15 (100%)	30 (100%)	113 (100%)	37 (100%)	470 (100%)

¹ missing values (N=9), ² missing values (N =7), ³ missing values (N =15), ⁴ missing values (N =49)

DOC-Doctors, NO-Nursing officers, MLT-Medical laboratory technologist, Min-Minor staff, JW-Janitorial workers

Knowledge on commencement, duration and OE protocols

Table 07 shows the knowledge of the study sample on commencement, duration of PEP and PEP protocols.

Table 07: Knowledge on commencement, duration and OE protocols

Category	DOC	NO	MLT	PHM	Min	JW	Total
	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)	Freq (%)
How can you get the best outcome of PEP for HIV after an occupational injury?							
By getting PEP as soon as possible preferably within first 24 hours	74 (86.0%)	160 (89.9%)	11 (73.3%)	20 (71.4%)	82 (73.2%)	27 (77.1%)	374 (82.4%)
No specific time period defined	2 (2.3%)	4 (2.2%)	0 (0.0%)	0 (0.0%)	15 (13.4%)	2 (5.7%)	23 (5.1%)
Getting PEP within 24-48 hours	5 (5.8%)	10 (5.6%)	2 (13.3%)	7 (25%)	4 (3.6%)	3 (8.6%)	31 (6.8%)
Getting PEP within 48-72 hours	5 (5.8%)	4 (2.2%)	2 (13.3%)	1 (3.6%)	11 (9.8%)	3 (8.6%)	26 (5.7%)
Total	86 (100%)	178 (100%)	15 (100%)	28 (100%)	112 (100%)	35 (100%)	454 ¹ (100%)
How long you have to take PEP drugs if recommended to get the maximum effect?							
3 days	30 (42.3%)	51 (29.1%)	6 (42.9%)	9 (36.0%)	47 (46.5%)	21 (70.0%)	164 (39.4%)
7 days	7 (9.9%)	19 (10.9%)	2 (14.3%)	4 (16.0%)	22 (21.8%)	3 (10.0%)	57 (13.7%)
14 days	12 (16.9%)	18 (10.3%)	0 (0.0%)	5 (20.0%)	15 (14.9%)	3 (10.0%)	53 (12.7%)
28 days	22 (31.0%)	87 (49.7%)	6 (42.9%)	7 (28.0%)	17 (16.8%)	3 (10.0%)	142 (34.1%)
Total	71 (100%)	175 (100%)	14 (100%)	25 (100%)	101 (100%)	30 (100%)	416 ² (100%)
What should be done regarding HIV after occupational injury?							
Send a blood sample of patient/source to STD clinic	10 (11.2%)	4 (2.2%)	1 (6.7%)	2 (6.7%)	13 (11.5%)	4 (11.1%)	34 (7.3%)
Send health care worker's blood sample to STD clinic	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (10.0%)	17 (15.0%)	16 (44.4%)	36 (7.7%)
Send both patient's and HCW's blood samples to STD clinic	36 (40.4%)	65 (35.5%)	8 (53.3%)	21 (70.0%)	56 (49.6%)	6 (16.7%)	192 (41.2%)
HCW should attend the nearest STD clinic with patient's blood sample	40 (44.9%)	114 (62.3%)	6 (40.0%)	4 (13.3%)	26 (23.0%)	10 (27.8%)	200 (42.9%)
Total	89 (100%)	183 (100%)	15 (100%)	30 (100%)	113 (100%)	36 (100%)	466 ³ (100%)
Do you know that there is a circular by Ministry of Health on occupational exposures and post exposure prophylaxis for HIV?							
yes	54 (64.3%)	118 (65.9%)	7 (46.7%)	26 (89.7%)	46 (43.8%)	26 (70.3%)	277 (61.7%)
no	30 (35.7%)	61 (34.1%)	8 (53.3%)	3 (10.3%)	59 (56.2%)	11 (29.7%)	172 (38.3%)
total	84 (100%)	179 (100%)	15 (100%)	29 (100%)	105 (100%)	37 (100%)	449 ⁴ (100%)
Is there a functioning protocol for occupational exposures in your hospital at present?							
yes	65 (78.3%)	157 (87.7%)	8 (53.3%)	23 (76.7%)	61 (61.0%)	28 (75.7%)	342 (77%)
no	3 (3.6%)	6 (3.4%)	2 (13.3%)	0 (0.0%)	8 (8.0%)	1 (2.7%)	20 (4.5%)
Don't know	15 (18.1%)	16 (8.9%)	5 (33.3%)	7 (23.3%)	31 (31.0%)	8 (21.6%)	82 (18.5%)
Total	83 (100%)	179 (100%)	15 (100%)	30 (100%)	100 (100%)	37 (100%)	444 ⁵ (100%)

¹ missing values (N=16), ² missing values (N =54) , ³ missing values (N =04) ⁴ missing values (N =21)

⁵ missing values (N=26),

DOC-Doctors, NO-Nursing officers, MLT-Medical laboratory technologist, Min-Minor staff, JW-Janitorial workers

Majority (82%) knew PEP is most effective when given within 24hours after exposure. However correct duration of PEP ; 28 days was only known by 34% (Table 07).

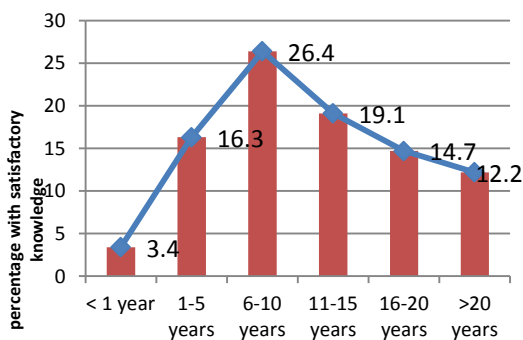
Table 08: Level of knowledge of HCWs

Level of knowledge	Designation						Total	Significance
	DOC	NO	MLT	PHM	Min	JW		
	Freq (%)	Freq (%)	(%)Freq (%)	Freq (%)	Freq (%)	Freq (%)		
good	15 (16.9%)	68 (36.6%)	2 (13.3%)	2 (6.7%)	3 (2.7%)	0 (0.0%)	90 (19.1%)	$\chi^2=74.336$ $df = 2$ $p=0.0001$,S
satisfactory	62 (69.7%)	107 (57.5%)	10 (66.7%)	20 (66.7%)	75 (66.4%)	23 (62.2%)	297 (63.2%)	
Poor	12 (13.5%)	11 (5.9%)	3 (20.0%)	8 (26.7%)	35 (31.0%)	14 (37.8%)	83 (17.7%)	
Total	89 (100.0%)	186 (100.0%)	15 (100.0%)	30 (100.0%)	113 (100.0%)	37 (100.0%)	470 (100.0%)	

S= significant, D-Doctors, NO-Nursing officers, MLT-Medical laboratory technologist, Min-Minor staff, JW-Janitorial workers

When categorizing the level of knowledge in to good, satisfactory and poor, it was found that only 19% of HCWs had good knowledge while 82.3% had above satisfactory knowledge. (Table 08) Nurses had significantly more knowledge level ($p = 0.0001$) compared to other categories of workers.

Satisfactory knowledge was increasing with the service period up to 6-10 years and then gradually declined ($p = 0.018$)[Graph 01].



Graph 01: Frequency of distribution of HCWs satisfactory knowledge with service period

Discussion

The current study revealed that only 17% of HCWs who had high risk OE gone for PEP counselling highlighting the missed opportunities for PEP. Furthermore 27.7% workers did not even report the injury, emphasising the underreporting of occupational I injuries by HCWs.

Lack of opportunity to get educated on HIV PEP was evident as the majority (82.5%) had not participated in an educational session on PEP within the previous year. Not to the surprise, the highest number of exposures as well as highest participation in educational session was reported by nurses. This was well experienced by the investigators in routine practice.

Many (88%) correctly identified the non risk exposure. Though 67% knew washing as the immediate step to follow minority (12%) still believed in wrong practises like squeezing. Only one third knew the correct duration of PEP despite their higher knowledge (82%) on effective timing of PEP.

It was remarkable to find out the poor knowledge of HCWs on Hepatitis B and C. Only around 1/3rd able to identify Hepatitis B as having highest risk of transmission while 33% said Hepatitis B,C and HIV viruses pose a similar risk. Nearly half did not know that there is no vaccination for prevention of Hepatitis C. This emphasizes that HCWs are unnecessarily worried about HIV ignoring the higher risk of Hepatitis B and C through OE. It is well known that mere knowledge would not always facilitate positive practices in people. This gap was well shown in the study. Though 55% of HCWs who had OE knew the need of PEP counselling; only 17% had actually gone for it.

It was seen that minority (19%) had good knowledge on PEP though many showed satisfactory level of awareness. Poor knowledge was much seen among the minor staff and janitorial workers who also had lowest opportunities of education sessions on PEP.

Nurses were more knowledgeable compared to other categories ($p=0.0001$). They had more OEs as well as more educational sessions. Thus it can be assumed that they gain more knowledge through experience and/or through education sessions.

Knowledge increased with their service period up to some level (6-10 years) and gradually declined ($p= 0.018$). This may be due to losing interest in learning or may be lack of learning opportunities when HCWs become more 'senior'.

Conclusions and Recommendations

Health care workers in Kegalle district had fairly satisfactory knowledge on OE and PEP but poor knowledge was demonstrated in some areas, especially first aid, duration of PEP and the risk of Hepatitis B and C following occupational injury. Moreover minor staff and janitorial workers' knowledge was not satisfactory.

Investigators recommend more regular educational sessions on OE and PEP to all categories of HCWs giving special attention to the minor staff members and janitorial workers who showed lowest levels of knowledge.

Considering difficulties to conduct sessions to cover all workers, we recommend designing and displaying posters on OE and PEP which include the steps to follow after an OE in all sections in the hospitals.

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