

Abstract

The Needle Stick Injuries of Interns and Residents  
Working in Hospitals in a City

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**Objectives:** This study was conducted in order to assess the experience of needle stick injury among interns and residents working in hospitals during the previous 4 months.

**Methods:** We conducted a questionnaire survey of 695 interns and residents working in two university hospitals and one general hospital in Tague city. Four hundred and forty three of those questioned(63.7 %) fully responded.

**Results :** Two hundred of the respondents(45.1 %) suffered at least one injury. Respondents suffered an average of 1.8 injuries. 96.5 % of interns, 40.6 % of surgical residents and 34.4 % of non-surgical residents suffered at least one injury. According to multiple logistic regression, Intern status and an increased amount of working time is associated with high risk of needle stick injury.

**Conclusions:** This study demonstrates that interns and residents suffer a high rate of needle stick injury.

**Key Words :** Needle stick injury, Interns, Residents

, 18 % 가

78.8 % ,

9.2 %, 7.5 %,

4.2 % .

가 Jackson (1986) 1,473

33.6 %가 1 1

10 105 72

가 68.6 %가

, 72 1

1.8 ( , 1994).

(job-related

injury가 가

가

( , 1997; , 1995; , 1996)

(needle-stick

injury가 가 (DeCarteret, 1987).

B (Callender , 1982; Plakoff, 2000 7

1986; Collins Kennedy, 1987; CDC, 1989; 2 1 695

Welch , 1989), A- B (DeCarteret, 가

1987), (Collins Kennedy, . 2000 3

1987; Advisory Group on AIDS, 1988; 6 가 4

Wallace Harrison, 1988)

가 , ( , , ,

),

451 64.9 %

가 1/3

(McCormick Maki, 1981). 8 443 (63.7 %)

60 80 1000

(Henry Campbell, 1995; EPINet, 1999). 1

Yassi A McG(1991) 1000 ( , 1994).

799 82 %가 SPSS 10.0 chi-

square test, 10.2 %, 5 12.8 % (Fig 1).  
 1.8 , 1000 1  
 5,377  
 가 45.9 %, 가 42.2 %, (multiple logistic regression analysis)  
 20 가 47.9 %, 30 가 40.3 %  
 가  
 12 (reference) 가 (Table 3).  
 가 (dummy variable) 96.5 %, 1 가 48.3 %, 2 가  
 48.3 %, 3 가 41.3 %, 4 가 29.3 %

4 72.8 % 가  
 42.9 % 가  
 79.7 %, 20.3 % , 30-39 가  
 35.9 %, 20-29 가 64.1 % (Table 2).  
 가 4  
 443 200 45.1 % , 1  
 11.5 %, 2 10.6 %, 3-4

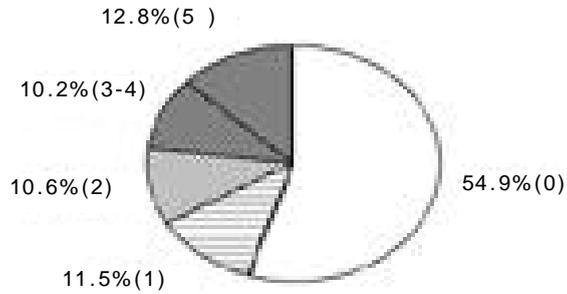


Fig. 1. Frequency of needle stick Injuries

Table 1. Responder distribution by grade

Grade	Responder No. (%)	Non-responder No. (%)	Total No. (%)
Intern	57(42.9)	76(57.1)	133(100)
R1	87(64.9)	47(35.1)	134(100)
R2	92(64.8)	50(35.2)	142(100)
R3	108(72.0)	42(28.0)	150(100)
R4	99(72.8)	37(27.2)	136(100)
Total	443(63.7)	252(36.3)	695(100)

R1, Resident grade1; R2, Resident grade2; R3, Resident grade3; R4, Resident grade4

Table 2. Demographic characteristics of study subjects

Characteristics	Grade					Total No. (%)
	Intern No. (%)	R1 No. (%)	R2 No. (%)	R3 No. (%)	R4 No. (%)	
Sex						
Male	50(14.2)	68(19.3)	69(19.5)	85(24.1)	81(22.9)	353(79.7)
Female	7( 7.8)	19(21.1)	23(25.6)	23(25.6)	18(20.0)	90(20.3)
Age(yrs)						
30-39	10( 6.3)	16(10.1)	21(13.2)	48(30.2)	64(40.3)	159(35.9)
20-29	47(16.5)	71(25.0)	71(25.0)	60(21.1)	35(12.3)	284(64.1)

R1, Resident grade1; R2, Resident grade2; R3, Resident grade3; R4, Resident grade4

Table 3. Frequencies of needle stick injuries by sex and age

Sex/Age	Subjects No( %)	Persons who had NSI No( %)	Number of NSI (Mean±SD)	Injury rate (per 1000 person-year)
<b>Sex</b>				
Male	353(79.7)	162(45.9)	1.9±3.8	5,669
Female	90(20.3)	38(42.2)	1.4±3.5	4,233
<b>Age(yrs)</b>				
30-39	159(35.9)	64(40.3)	1.8±4.6	5,528
20-29	284(64.1)	136(47.9)	1.8±3.1	5,292
<b>Total</b>	<b>685(100)</b>	<b>200(45.1)</b>	<b>1.8±3.7</b>	<b>5,377</b>

NSI, needle stick injury

Table 4. Frequencies of needle stick injuries by grades

Grades	Subjects No(%)	Persons who had NSI No(%)	Number of NSI (Mean±SD)	Injury rate (per 1000 person-year)
Intern	57(12.9)	55(96.5)	4.5±5.2 <sup>a</sup>	13,421
R1	87(19.6)	42(48.3)	1.5±2.7 <sup>b</sup>	4,621
R2	92(20.8)	38(41.3)	1.7±4.1 <sup>b</sup>	5,022
R3	108(24.4)	36(33.3)	1.2±3.4 <sup>b</sup>	3,694
R4	99(22.3)	29(29.3)*	1.2±2.8 <sup>†</sup>	3,576
<b>Total</b>	<b>443(100)</b>	<b>200(45.1)</b>	<b>1.8±3.7</b>	<b>5,377</b>

NSI, needle stick injury

\*P&lt; 0.01 by chi-square test; † P&lt; 0.01 by ANOVA

<sup>a, b, †</sup>: Group with the same letter were not significantly different by Scheffe's test

Table 5. Frequencies of needle stick injuries by department

Department	Subjects No( %)	Persons who had NSI No( %)	Number of NSI (Mean±SD)	Injury rate (per 1000 person-year)
Intern	57(12.9)	55(96.5)	4.5±5.2 <sup>a</sup>	13,421
Surgical <sup>1</sup>	197(44.4)	80(40.6)	2.0±4.3 <sup>b</sup>	6,328
Non-surgical <sup>1</sup>	189(42.7)	65(34.4)*	0.8±1.4 <sup>†</sup>	2,223
<b>Total</b>	<b>443(100)</b>	<b>200(45.1)</b>	<b>1.8±3.7</b>	<b>5,377</b>

NSI, needle stick injury

\* P&lt; 0.01 by chi-square test; † P&lt; 0.01 by ANOVA

<sup>a, b, †</sup>: Group with the same letter were not significantly different by Scheffe's test

<sup>1</sup>) Residents working in department of general surgery, thoracic & cardiovascular surgery, orthopedics, neuro-surgery, plastic reconstructive surgery, obstetrics & gynecology, urology, ophthalmology, otolaryngology, emergency medicine.

<sup>2</sup>) Residents working in department of internal medicine, pediatrics, neurology, dermatology, radiology, anesthesiology, clinical pathology, surgical pathology, psychiatry, rehabilitation medicine.

가 (p<0.01), 5.2 ,  
 (p<0.01)(Table 4). 2.6 ,  
 가 (p<0.01)(Table 6).  
 96.5 % , 가 40.6 % , 7  
 가 34.4 % 가 .  
 (p<0.01), 4.5 , , ,  
 가 2.0 , 가 0.8 ,  
 가 (p<0.01)(Table 5). 가  
 14.8 (p<0.05)(p<0.01)(Table 7).

Table 6. Occupational conditions associated with grades

Grades	Working(hrs) Mean±SD	Sleeping(hrs) Mean±SD	Night duty(day/wk) Mean±SD
Intern	17.0±4.5 <sup>a</sup>	4.6±2.8 <sup>a</sup>	5.3±2.8 <sup>a</sup>
R1	17.2±3.5 <sup>a</sup>	4.3±1.2 <sup>a</sup>	3.6±1.7 <sup>a</sup>
R2	16.0±4.6 <sup>b</sup>	5.1±1.0 <sup>b</sup>	2.5±1.5 <sup>b</sup>
R3	13.1±2.9 <sup>c</sup>	5.8±0.8 <sup>c</sup>	1.6±1.5 <sup>d</sup>
R4	12.3±2.5 <sup>*</sup>	5.8±0.9 <sup>*</sup>	1.4±1.6 <sup>d*</sup>
Total	14.8±4.0	5.2±1.5	2.6±2.2

\* P< 0.01 by ANOVA

<sup>a, b, c, d</sup> : Group with the same letter were not significantly different by Scheffe's test

R1, Resident grade1; R2, Resident grade2; R3, Resident grade3; R4, Resident grade4

Table 7. Frequencies of needle stick injuries by occupational conditions

Occupational conditions	Subjects No( %)	Persons who had NSI No( %)	Number of NSI (Mean±SD)	Injury rate (per 1000 person-year)
Working(hrs)				
12	144(32.5)	45(31.3)	1.4±4.5	4,313
13-15	124(28.0)	51(41.1)	1.5±3.1	4,524
16	175(39.5)	104(59.4) <sup>*</sup>	2.3±3.4	6,587
Sleeping(hrs)				
4	122(27.5)	71(58.2)	3.7±0.3 <sup>a</sup>	7,279
5-6	283(63.9)	118(41.7)	1.4±3.1 <sup>b</sup>	4,325
7	38(8.6)	11(28.9) <sup>*</sup>	2.4±6.8 <sup>b†</sup>	7,105
Night duty (day/wk)				
0	65(14.7)	18(27.7)	1.5±5.3 <sup>a</sup>	4,385
1-2	180(40.6)	67(37.2)	1.4±2.8 <sup>a</sup>	4,067
3-4	106(23.9)	53(50.0)	1.6±2.9 <sup>a</sup>	4,811
5	92(20.8)	62(67.4) <sup>*</sup>	3.1±4.6 <sup>b‡</sup>	9,293
Total	443(100)	200(45.1)	1.8±3.7	5,377

NSI, needle stick injury

\* P< 0.01 by chi-square test; † P< 0.05 by ANOVA; ‡ P< 0.01 by ANOVA

<sup>a, b</sup> : Group with the same letter were not significantly different by Scheffe's test

Table 8. Multiple logistic regression analysis

Variables	Odds ratio	95 %CI
Department		
RNSD	1.0	
Intern*	40.4	9.5 -172.0
RSD	1.2	0.8 - 1.8
Working(hrs)		
12hrs working	1.0	
13-15hrs working	1.6	0.9 - 2.7
16 hrs working*	2.2	1.3 - 3.6

RSD, Residents working in surgical departments  
 RNSD, Residents working in non-surgical departments  
 \*P< 0.01

(multiple logistic regression analysis)

가 가 . 가

가

200

45.1 %

(multicollinearity) 28.8 % . Gomperz(1990)

10

8

3 12 (reference) . 28 % 63 %

16

odds

40.4, 16 가 2.2 1000 5,377

(Table 8).

Astbury Baxter(1990) 1160 ,  
 (1997) 1443

가

recall bias . Hamory(1980) 60

가 %가 . Jacobson

가 (1983) 1/3

3 6 4

(Hamory,

1 1000 1983; Jacobcon , 1983),  
 1000 (Hamory, 1983),

가  
(Hamory, 1983; Jacobson, 1983). 500  
가  
(McCormick, Maki, 1981). Anon(1982)  
(1997) 1,2  
16  
Gomperz(1990)가 1,133 (1994)  
1,474  
5  
(1994)  
1000 5,377  
가 3 6 가 14  
4 가 1 1.8  
가 200  
794 1 4  
가 5 64  
(12.8 %) 가 가  
가 가  
가 가 (95.5 %)  
(immunization) 12.6 %  
가 (Hepatitis), (AIDS),  
(Malaria), Rocky Mountain spotted fever,  
(Tuberculosis), (Herpes Simplex),  
Creutzfeldt-Jakob Disease, (Tetanus)  
(Syphilis) (DeCarteret, 1987) B  
( ) 가 (HBV)  
B 30 %

(HIV) (63.7 %) : 가 4  
 0.3 % 100 : 443 200 45.1 %  
 가 , 1.8 , 1000 1  
 B (endemic 5,377 . 96.5  
 area) , AIDS %, 가 40.6 %, 가  
 34.4 %

(multiple logistic regression analysis)

(Lee , ,  
 , 2001) intravenous catheter , 12 16  
 가 가 ,  
 , :

(CDC, 1987; CDC, 1988;  
 Wong , 1991) 26(3):605-622, 1996.  
 (needle disposal system) . 2001.7.  
 (Krasiniski , 1987; Ribner ,  
 1987; Edmond, 1988; Smith , 1992) (needle-stick injury)  
 가 , 27(3):403-409, 1994.  
 needle guard, needle cap cork Needle Stick  
 (Huber Summer, 1985; Summer, 1985; Injury B  
 Arnott, 1986; Nixon , 1986; Goldwater, , 19(1):29-41, 1997.  
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