
Research Article

Needle Stick Injuries Prevention by Implementing Proper Techniques and Educating Health Care Personnel

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Abstract: Instead of various Health education programmes, HBV vaccine availability, good supply of personal protective equipment, Biomedical waste management rules in many hospitals and laboratories, needle stick injury precautions were not following. The aim of the study is to assess the needle stick injuries rate after implementation of proper techniques in hospital and educating health care personnel regarding needle stick injuries. Structured questionnaire gave to control and case group to answer in the month of may 2016 after educating them regarding needle stick injuries and implementing proper techniques to avoid needle stick injuries. After obtaining the answers to this questionnaire from studied health care personnel, all the results were analyzed. In this study 23% of PPE usage increased, 27% increased in knowing patient status about HBV, HCV, HIV, 77% increase in entering incident into register, 13% and 15% improvement in post exposure test and counseling respectively in case group. All Health care Personnel should follow the universal precautions related to the particular procedure. Education trainings should focus on rules of biomedical waste management, needle exchange program, no re-capping of needle guidelines to reduce needle stick injury exposure and transmission of blood borne viruses.

Key Words: Needle Stick Injury, Educational training activities.

I. INTRODUCTION

Needle stick injuries are the wounds caused by accidental penetration of skin by sharp objects which was in contact with blood, blood products, tissue or body fluids before the exposure [1]. Needle stick injuries are usually percutaneous injuries and hazards to those people who work with hypodermic syringes, suture needles, i.v cannulas and other needle exposure prone procedures.

Occupational exposure of needle stick injuries occurs among doctors, nurses, laboratory technicians, biomedical waste management staff and other health care workers. In united states Needle stick injury among health care workers was about 80% [1,2]. Other than health care workers, many people such as tattoo artists, food preparers, agricultural workers are also expose to needle stick injuries [2,3].

In 2007, the estimated annual global needle stick injuries at 2 million per year by World Health Organization and also another study estimated 3.5 million injuries yearly [3,4].

Most commonly studied and reported viruses that are transmitted by needlestick injuries are Hepatitis B Virus, Hepatitis C virus, Human Immunodeficiency virus and these viruses risk of acquiring is highest [5]. But more than 25 blood

borne viruses caused by needlestick injuries were reported worldwide among hospital and laboratory personnel [6].

Instead of various Health education programmes, HBV vaccine availability, good supply of personal protective equipment, Biomedical waste management rules in many hospitals and laboratories, needle stick injury precautions were not following. The aim of the study is to assess the needle stick injuries rate after implementation of proper techniques in hospital and educating health care personnel regarding needle stick injuries.

II. MATERIALS & METHODS

This is a prospective comparative study conducted in the months of february 2016 and May 2016 at a tertiary care hospital, ACSR Government Medical College, Nellore, Andhra Pradesh to evaluate the efficacy of implemented proper techniques in reducing the risk of needle stick injuries.

A total of 150 Health care workers (controls and cases) were evaluated their practices while using sharp objects by structured questionnaire. Informed consent was taken from all health care personnel before doing the study. Procedure and importance of doing this study was explained to selected

population before doing this study.

Control Group - 100 Healthcare workers who had needle prick in the year 2015 including nurses, biomedical waste management staff were included in this study and considered them as controls.

Case Group - 50 Healthcare workers (nurses, technicians, biomedical waste management staff) who had a needle prick in the months of march and april of 2016 were included and considered as cases.

Structured questionnaire gave to control and case group to answer in the month of may 2016 after educating them regarding needle stick injuries and implementing proper techniques to avoid needle stick injuries. Questionnaire were related to usage of personal protective equipment, vaccination against HBV, patients status about HBV, HIV, HCV, post exposure test, post exposure prophylaxis. Various policies and procedures were introduced at different levels and educational activities conducted in hospital many times for two months to reduce the risk of needle stick injuries.

Techniques implemented were: Using Single hand or scoop method during recapping, Personal protective equipment usage during sample handling, safe disposal and handling of needles/ sharp objects, participate in training related to infection prevention, mandatory vaccination schedule to be followed against HBV, reporting to medical officer immediately after the prick, knowing patient status regarding HIV, HBV, HCV, post exposure prophylaxis, Incident reporting register.

After obtaining the answers to this questionnaire from studied health care personnel, all the results were entered into Microsoft excel sheet and analyzed. Statistical tools were applied to this study by ratio, percentage, proportion, histogram.

III. RESULTS

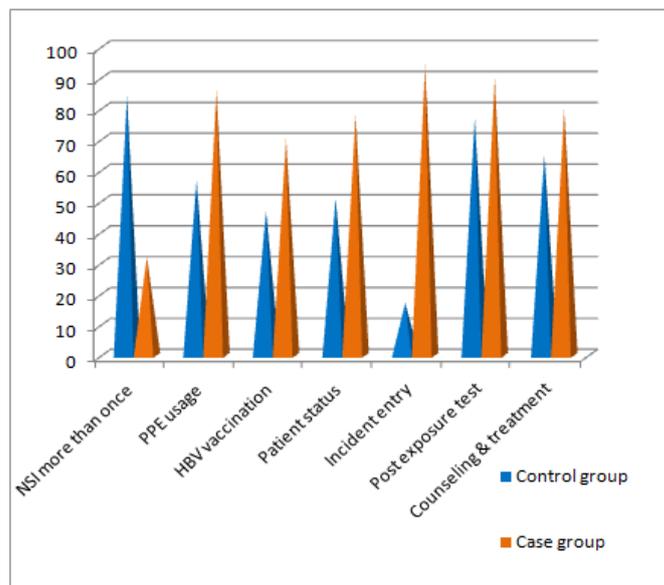
A total of 150 Health care workers were included in this study. Out of 150, 100 were considered as controls who had needle prick in the year 2015 and remaining 50 were considered as cases who had needle prick after implementing policies and providing training activities to prevent infections. Distribution of nurses and biomedical management staff who had needle pricks among both groups were tabulated in Table No.1

Health care personnel	Controls Group (n=100)		Cases Group (n=50)	
	No. of Persons	Percentage	No. of Persons	Percentage
Nurses	65	65%	36	72%
BioMedical Staff	35	35%	14	28%
Total	100	100%	50	100%

Table No.1 Number of Nurses and BioMedical Management Staff with needle stick injury exposure

Frequency of NSI more than once, Gloves worn during handling sharp objects, vaccinated with HBV or not, patient status about HBV, HIV or HCV known or not, Incident entered into NSI reporting register or not, post exposure test done or not for screening, counseling and retraining received from medical officer or not. These data was collected from NSI exposed health care staff and analyzed (Fig No.1).

Fig No.1 Percentage of various activities in control and case group



Compliance was better observed in cases group when compared to control group. After implementation of training activities NSI incident entry into register, frequency of NSI decreased, PPE usage increased, knowing patient status about HBV, HCV, HIV, vaccination against HBV shown higher improvement in case group than control group.

Nurses and Bio Medical staff were improved in various aspects among case group when compared to control group after giving training activities to health care personnel, to reduce the risk of needle stick injury exposure. Nurses responded better than biomedical staff in many activities especially pertaining to post exposure testing and counseling after test (Table No.2).

Health care personnel	Controls Group (n=100)		Total	Cases Group (n=50)		Total
	No. of Nurses (n=65)	No. of Bio Medical staff (n=35)		No. of Nurses (n=36)	No. of Bio Medical staff (n=14)	
NSI more than once	58	26	84 (84%)	12	4	16 (32%)
PPE usage	33	24	57 (57%)	30	13	43 (86%)
HBV vaccination	35	12	47 (47%)	25	10	35 (70%)
Patient status	32	19	51 (51%)	27	9	36 (78%)
Incident entry	15	2	17 (17%)	34	13	47 (94%)
Post exposure test	49	28	77 (77%)	34	11	45 (90%)
Counseling & training	43	22	65 (65%)	30	10	40 (80%)

Table No.2 Number of nurses and biomedical staff involved in activities among both groups

IV. DISCUSSION

Needle stick injuries usually occurs during various procedures such as blood drawing, suturing, i.m/i.v drug administration, disposal of needles, blood transfusion, surgeries, i.v cannula etc., During blood drawing and disposal of needles most of the injuries were reported [7,8].

In this study 23% of PPE usage increased, 27% increased in knowing patient status about HBV, HCV, HIV, 77% increase in entering incident into register, 13% and 15% improvement in post exposure test and counseling respectively in case group.

Personal protective equipment should definitely be worn by health care staff during various procedures to avoid transmission of microorganisms. There is an increase in risk of needle stick injuries when personal protective equipment is not in use [6].

Out of 100, 84 (84%) health care personnel had needle stick exposure more than once in control group whereas, in case group out of 50, 16 (32%) members had needle stick exposure more than once. This reduction in needle stick exposure is mainly due to training on sharps handling and safe disposal.

One of the major reason in order to increase percutaneous injuries which may due to recap needles despite universal precautions. These include difficulty of unlearning habits that were previously considered good practice, devices that are engineered in a fashion that requires disassembly for proposal, a lack of conveniently located disposal containers, and time constraints due to high workloads or emergency situations [9].

All the health care workers should know the infections transmitted by needle stick injuries and their consequences. Following universal precautions not only break the transmission of blood borne viruses from patient to health care worker, also from health care worker to patient.

In the present study nurses and biomedical staff were included as the nurses are backbone to carry various tasks related to patient treatment especially sharps related. Nurses and Biomedical Management staff mostly involved in works related to sharps more time and also facing much work load. Eunhee choo et al [10], Sumathi muralidhar et al [8] reported that nurses were most commonly exposed to NSI than other health care staff.

Health care workers were not compliance to the universal precaution and no re-capping of needle guidelines. They were lack of knowledge on blood borne pathogen infectious diseases [9].

V. CONCLUSION

As per this study needle stick injury exposure reduced after proper training activities to health care personnel and implementation of policies and rules such as using PPE, safe handling and disposal of sharps, incident report register entry,

mandatory post exposure test and counseling. All Health care Personnel should follow the universal precautions related to the particular procedure. Education trainings should focus on rules of biomedical waste management, needle exchange program, no re-capping of needle guidelines to reduce needle stick injury exposure and transmission of blood borne viruses.

VI. REFERENCES

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