Original Article

Bio-Safety, Biohazards of Ht. Staff

Evaluation of Knowledge Attitude and Practice of Health Care Staff on Bio-Safety and Biohazards, District Pakpattan - Punjab

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ABSTRACT

Objectives: To evaluate the knowledge, attitude and practice of health care staff on bio-safety and biohazards in District Pakpattan.

Study Design: Cross Sectional epidemiological Study.

Place and Duration of Study: This study was conducted in District Pakpattan Punjab, Pakistan from 1st August 2013 to 30th August 2013.

Materials and Methods: The study was carried out to evaluate the knowledge attitude and practice on bio-safety and biohazards of health care providers, who are directly involved in the patient handling e.g. doctors, lady doctor, laboratory and blood bank technicians, Nurses, Dispensers, Lady Health Visitors, Vaccinators ,OT Assistants, dental technicians, dental surgeons, while others were excluded. The target population was 552, and 33% (N=184) population was included in the study as non probability sample to reduce the bias in this reference epidemiological study. A standard questioner was pretested to identify weaknesses and strengths. Respondents interviewed individually and data was analyzed by using SPSS.15.0 for Widows Evaluation Version. Keeping Ethical Consideration in view, formal consent and permission was obtained from concerned Authorities and respondents.

Results: The study results on the variables were as; 27(14.6%) had specific training on bio-safety and biohazards,157(85.3%) had no structured training. 96(52%) respondents had habit of eating at work place, laboratory, dressing or examination rooms , 83(45%) don't have this habits or practice while 6 (3.2%) do this practice sometimes. 98(53%) had habits of storing edibles in the refrigerators meant for vaccines or laboratory purpose, 84(45.6%) don't have this habits and 2(1.0%) do this practice sometimes. Among females(N=91), 35(38.4%)using cosmetics at work place,42(46%) don't have this habits or practice,11(12%) do this practice sometimes. 0ut of 161 the 62(40%) had habits of smoking or sniffing at work place, 99(60%) don't have this habits or practice . 89(48.3%) had habits of cutting nail with teeth and putting pen in the mouth at work, rest 93(50%) don't have this habits or practice.

Conclusion: The study results are consistent and supported by many studies already conducted. Results showing poor knowledge, attitude and poor practices. It demonstrates the serious need of trainings on bio-safety and continuous monitoring on the practices to minimize the health risk, which is a hidden public health problem.

Key words: Bio-safety, bio-hazards, knowledge, attitude and practices, health care providers

INTRODUCTION

Sharps and the biohazardious materials are the major risk among health care and laboratory workers who are threatened by human pathogens. The biological hazards are defined as "A biological agent or condition (as an infectious organism or insecure laboratory conditions) that constitutes a hazard to man or his environment; also a hazard posed by such an agent or condition".[1]

Blood and certain fluids of all patients are considered potentially infectious for HIV,HBV and blood born pathogens[2]. Laboratory workers are exposed to large pool of specimens from patients suffering from infectious such as HBV & HIV[3-4].However they seems to have poor perception of risk of infection and are not compliant with the basic principles of universal precautions.[5-6]

Around 250,000 tonnes of medical waste is annually produced from all sorts of health care facilities in the country which has bad affect on the environment and surrounding and 15 tons of waste is produced daily in Punjab.

Different types of exposure, contact with highly dangerous agents, lack of limit values able to compare all exposures, presence of workers with defective immune systems and therefore more susceptible to the risk.

Vaccination represents an effective tool to minimize risk of occupational and nosocomial transmission for many relevant communicable diseases.

Occupational exposures to biological agents can occur in several sectors, such as health, agriculture, forestry, animal husbandry, food, veterinary, biotechnology,

waste processing and disposal, laboratories, and dentistry, [7-8]

The likelihood of acquiring an infection after occupational exposure is < 0.3% for HIV, 0.5% for HCV, and 18% to 30% for HBV[9].

Transferring the knowledge of preventive measures into practice by health care personals remains inadequate[10]. In Italy most of the data has been collected in hospital settings and, more specifically, by surveys of nurses[11-12].

Percutaneous exposure incidents (PEIs) (needle stick, sharp injuries, as well as splashes leading to exposure of the skin or mucosa to blood) are a major concern in hospitals even in developed countries such as the United States [13-14]. PEIs may increase hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) transmission risk in the healthcare setting has been thoroughly reviewed in the literature and post exposure prophylaxis, when available, is therefore recommended [15]. The under reporting of PEIs by doctors may be related to their unwillingness to reveal the incidence or lack of motivation due to the belief that they can handle the issue themselves [16]. Other studies have shown that a vaccination program in healthcare workers against HBV is cost-effective, decreases the anxiety of an employee after needle stick and sharp injuries, and prevents the transmission of HBV after exposure in the majority of cases [17-18].

Exposure to chemical and physical hazards, lack of safety training, and low levels of safety climate and safety practices remained significant risk factors for Work Related Injuries[19].

MATERIALS AND METHODS

This was cross sectional epidemiological study. Sample size was (N=184) Health care providers under effect of this study were 552, pertaining to the categories mentioned in inclusion criteria. 33% health care providers were selected randomly to reduce the bias in this reference epidemiological study.

Health staff who were directly involved in the patient handling e.g. doctors, lady doctors, laboratory and blood bank technicians, Lab Attendants, Nurses, Dispensers, Lady Health Visitors, Vaccinators ,Operation Theatre Assistants, dental technicians, dental surgeons, surgeons and gynaecologists were included while other health care personals were excluded. Keeping Ethical Consideration in view, formal consent and permission was taken from concerned Authorities and respondents.

Data Collection, Procedure and Data Tools

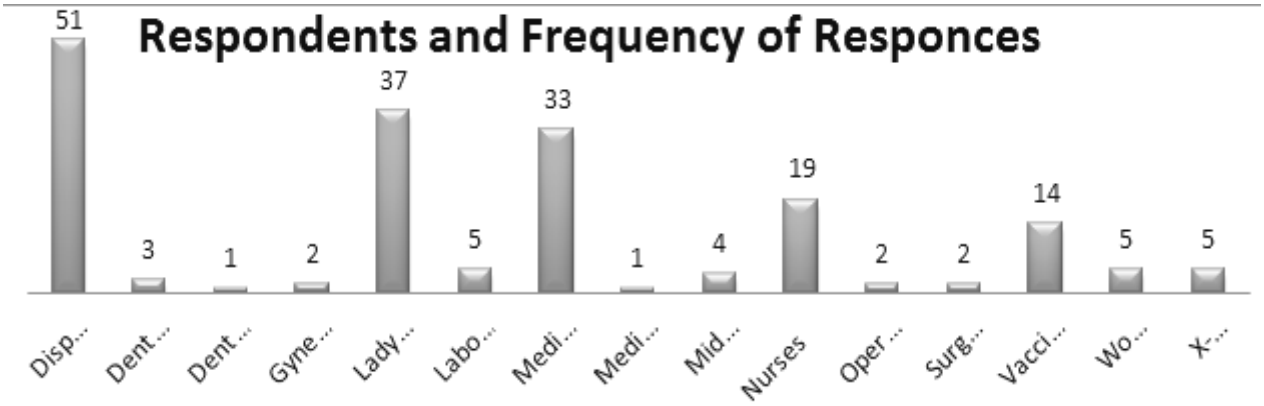
A Standard questioner was developed and pretested, to identify the weaknesses and strengths.

The following variables were included ; training on biohazards, eating in Lab, operation theatre or at other work places, storage of food in vaccine & medicine fridge, application of cosmetics in lab, operation theatre or at examination place, smoking or sniffing in Laboratory or dressing rooms, cutting of finger nails with teeth or putting of pen in mouth, wearing hand gloves during surgical examination or Laboratory work, putting on of white coat during the work, immunization against the hepatitis B, washing of hands after removal of hand gloves, participated in tuberculosis skin testing, taking shower after laboratory work, needle pricks during last one year period and cuts or injury during work.

For data collection school health and nutrition supervisors were trained and sent to the health facilities Data was compiled in the excel format.

RESULTS

In this study we found that only 27(14.6%) health care providers had specific training on bio-safety and biohazards. 96(52%) health personals had habits of eating at work place, laboratory, dressing or examination rooms, 83(45%) don't have this habits or practice and 6 (3.2%) do this practice sometimes. 98(53%) respondents had habits of storing edibles in the refrigerators meant for the vaccines or for laboratories, 86(45.6%) don't have this habits or practice.



Graph No.1: Showing Frequencies of Responses

Table No.1: Study Variables, Responses and Frequencies

		Yes	No	Some time
1.	Do they have any training on Bio - hazards?	27	157	-
2.	Eating in the laboratory/OT/Dressing Room/ Examination Room/Work place.	96	83	6
3.	Storage of food and water in the refrigerator meant for body Fluids, drugs, chemicals, vaccines or other specimens.	98	84	2
4.	Application of cosmetics (for female staff) in Lab. Examination Room, OT.(N=91)	35	42	11
5.	Smoking or sniffing in the Laboratory, OT or Dressing rooms.(N=161)	62	95	1
6.	Cutting of finger nails with teeth or putting the pen in the mouth.	89	92	1
7.	Wearing of hand gloves during surgical procedures/ Examination or Laboratory work.	103	80	1
8.	Putting on of white/lab coats while working.	91	34	57
9.	Immunization against Hepatitis B.	100	84	-
10.	Washing of hands after removal of hand gloves.	78	106	-
11.	Participation in periodic tuberculosis skin testing.	47	137	-
12.	Taking of shower immediately after participating in laboratory work, Wearing of gloves.	50	120	14
13.	Do you have needle prick during your job in last 1 year?	119	65	-
14.	Do you have any injury or cut on your hands during work?	110	74	-

Among females 91(N=91),35(38.4%) had habits of using cosmetics at work place, 42(46%) female don't have this habits or practice and 11(12%) do this practice sometimes. 0ut of 161 the total 62(38.5%) had habits of smoking or sniffing at their work place, rest 96(59%) don't have this habits or practice. 89(48.3%) had habits of cutting nail with teeth and putting pen in the mouth at work, 93(50%) don't have this habits. 47(25.5%) participating in the periodic tests for Tuberculosis, 137(74.5%)don't participate.

Out of 184(N=184), 119(64.6%) had needle pricks during job in last one year, 65(35.3%) were not exposed to the needle stick injuries and similarly 110(60%) had other injuries during work, 74(40%) don't have injuries. A total 100(54.5%) were immunization against hepatitis B, 84(45.5%) were unimmunized.

DISCUSSION

Studies conducted in Pakistan and in other countries of the world on the same topic are consistent with results of this study and results are strongly supported.

In this study we found 27(14.6%) health care providers had specific training on bio-safety and biohazards, 157(85.3%) don't have any structured training. The results are supported as "Exposure to chemical and physical hazards, lack of safety training, and low levels of safety climate and safety practices remained significant risk factors for Work Related Injuries. In 96(52%) health personals had habits of eating at work place, laboratory, dressing or examination rooms, 83(45%) don't have this habits or practice and 6 (3.2%) do this practice sometimes. 98(53%) respondents had habits of storing edibles in the refrigerators meant for the vaccines or laboratories, 84(45.6%) don't have this habit, 2(1.0%) do this practice sometimes. Among females(N=91), 35(38.4%) had habits of using cosmetics at work place, 42(46%) don't use, rest 11(12%) do this practice sometimes. 0ut of 161 the 62(38.5%) respondents had habits of smoking or sniffing at their work place, 96(59%) don't have this habits or practice. 89(48.3%) cutting their nails with teeth and putting pen in mouth at work, 93(50%) don't have this habits. The study results are consistent with many other studies in which safe environment and separate place for health care professional are recommended for eating and for other personal needs.

Out of 184 total 103(56%) had habits of wearing surgical gloves during surgical procedures or examination, 81(43.5%) don't have use. 91(49.5%) health care providers had habits of wearing white coat/lab coats during surgical procedures or examination, rest 34(18.5%) don't wear rest 57(31%) wear occasionally. Non use of appropriate equipments or barriers has been shown in another study which support the result of our study. [15].

A study in Karachi Pakistan, Results showed that 46% of the respondents (34.2% from Punjab, 61.9% from Sindh, 25.2% from Balochistan and 85% from KPK) said they reused syringes either occasionally or regularly. 30.7% of the respondents said they discard used syringes directly into municipal dustbins. The majority (66.7%) claimed there are no separate bins for sharps, so they throw these in municipal dustbins. Standard operating procedures were not available in 67.2% labs, and accident records were not maintained

in 83.4%. No formal bio-safety training had been provided to 84.2% of the respondents [20].

In our study among total respondents (N=184), 100(54.5%) health care providers had immunization against hepatitis B , rest 84(45.5%) are unvaccinated. Vaccination program in healthcare workers against HBV is cost-effective, decreases the anxiety of an employee after needle stick and sharp injuries, and prevents the transmission of HBV after exposure in the majority of cases [17-18].

A total 78(42.3%) respondents had habits of washing hands after removal of surgical gloves, 106(57.6%) don't wash. 50(27%) health care providers had habits of taking shower immediately after participating in laboratory work and wearing of gloves, 120(65.2%) don't have this habits or practice and 14(7.6%)do this practice sometimes. Non use of shower after work or washing hands can cause many diseases, especially latex allergy and other disease.

In this study 47(25.5%) health personals were participating in the periodic tests for Tuberculosis, 137(74.5%) don't participate in the tuberculosis test. Many studies proved that precautionary measures and tests in this regards can minimise the risk of the disease development.

Total respondents were 184(N=184), out of which 119(64.6%) had needle pricks during job in last one year, 65(35.3%) were not exposed. Similarly 110(60%) had other injuries during work, 74(40%) don't have injuries in this period. Needle stick and sharp injuries may be combined with failure to use appropriate barrier garments (e.g. hand gloves of proper size) [13-14].

CONCLUSION

The study results are consistent and supported by many studies showing poor knowledge, attitude and practices. This demonstrates the serious need of trainings on bio-safety and continuous monitoring on the practices to minimize the health risk, which is a hidden public health problem. Health care workers belong to a high risk occupational group so keeping in view, it is essential to take all available and effective organizational technical and medical measures to protect the health care personals.

REFERENCES

1. Webster's 9th New Collegiate Dictionary, Miriam-Webster Inc. Publishers, Springfield, MA USA, 1985.
2. Ogunbodede EO: Occupational hazard and safety in dental practice. Nig J Med 1996;5:11-13.
3. Nwabuisi C. Olatunji PO. Prevalence of Hepatitis B surface antigen amongst tertiary health workers in Ilorin. Nig Qrt J Hosp Med 1999;9: 95-97.
4. Falope IA, Adedeji OO, Eyesan SU. Incidence of HIV positivity in trauma victims over the age of 20years. The Niger Postgraduate Med J 1998;5: 115-117.
5. Adebamowo CA, Ajuwon A. The immunization status and level of knowledge about Hepatitis B virus infection among Nigerian surgeons. West Afr J Med 1997;16:93-1696.
6. Brusaferro S. Martina P. Puzzolante L. Epidemiological study on knowledge, attitudes and behaviour of health care workers with respect to HIV infection. Med Lav 1997;88: 495-506.
7. Castiglia P, Liguori G, Montagna MT, Napoli C, Pasquarella C, Bergomi M, et al. SItI Working Group Hygiene in Dentistry. Italian multicenter study on infection hazards during dental practice: control of environmental microbial contamination in public dental surgeries. BMC Public Health 2008;8:187.
8. Reiman M, Uitti J. Exposure to microbes, end toxins and total dust in cigarette and cigar manufacturing: an evaluation of health hazards. Ann Occup Hyg 2000;44(6):467-73.
9. Pruss-Ustun A, Rapiti E, Hutin Y. Sharp injuries: global burden of disease from sharp injuries to health-care workers. WHO Environmental Burden of Disease Series No. 3. Geneva: WHO; 2003.
10. Sreedharan J, Muttappallymyalil J, Venkatramana M. Knowledge and practice of standard measures in occupational exposure to blood and body fluids among nurses in a University Hospital in the United Arab Emirates. Ital J Public Health 2010;7(1):90-4.
11. Sindoni L, Calisto ML, Alfino D, Cannavo G, Grillo CO, Squeri R, et al. Retrospective survey on epidemiologic monitoring of accidents due to professional exposure to biological agents in A.O.U. "G. Martino" of Messina,Italy. Ann Ig 2005;17(1):67-74.
12. Daglio M, Sacchi M, Feletti T, Lanave M, Marena C, Zambianchi L, et al. Accidents due to biological risk in health personnel: descriptive epidemiological analysis of the decade 1994-2003. G Ital Med Lav Ergon 2006;28(4):457-65.
13. Doebbeling BN, Vaughn TE, McCoy KD, Beekmann SE, Woolson RF, et al: Percutaneous injury, blood exposure, and adherence to standard precautions: are hospital-based health care providers still at risk. Clin Infect Dis 2003;37: 1006–13.
14. Agerton TB, Mahoney FJ, Polish LB, Shapiro CN. Impact of bloodborne pathogens standard on vaccination of healthcare workers with hepatitis B vaccine. Infect Control Hosp Epidemiol 1995; 16:287–91.

15. Gimeno D, Felknor S, Burau K, Delclos G. Organisational and occupational risk factors associated with work related injuries among public hospital employees in Costa Rica: Occup Environ Med 2005;62(5): 337–343.
16. Levitin HW, Siegelson HJ. Hazardous materials. Disaster medical planning and response. Emerg Med Clin North Am 1996;14(2):327-48.
17. Dibenedetto Dvaaohn J. Occupational hazards of the health care industry: protecting health care workers 1995;43(3):131-7.
18. Kershenobich D, Hurtado R, Collawn C, Bobadilla J, Cabrera G, Borovoy J, et al. Seroprevalence of viral markers of hepatitis B among health professionals. Multicenter study in Mexico. Rev Invest Clin 1990;42(4):251-6.
19. European Commission (2007). Decisions adopted jointly by the European Parliament and the Council" under Health Programme 2008–2013. Retrieved November 3, 2012
20. Nasim S, Shahid A, Mustufa MA, Arain GM, Ali G, Taseer IU, et al. Bio-safety perspective of clinical laboratory workers: a profile of Pakistan. J Infect Dev Ctries 2012;6(8):611-9.

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