

Full Length Research Paper

Reuses of syringes: A social crime related to health care waste management

Shazia Tabassum Hakim¹, Syed Muhammad Humair Tayyab³, Amna Shafiq¹ and Sayyada Ghufrana Nadeem²

¹Virology and Tissue Culture Laboratory, Department of Microbiology, Jinnah University for Women, Karachi-74600, Pakistan.

²Mycology Research and Reference Institute, Department of Microbiology, Jinnah University for Women, Karachi-74600, Pakistan.

³EEE, Karachi, Pakistan.

Accepted 10 January, 2012

Reuse of used syringes due to improper disposal is a common practice especially in the developing countries, including Pakistan. Major aim of the study was to assess the level of knowledge of students towards reuse of used syringes, their improper disposal and the resulting blood borne infections due to such wrong practices. A total of 40 students were selected for the study. A questionnaire was circulated among the students of microbiology at Jinnah University for Women, Karachi, Pakistan. The data collected was compiled and statistical analysis through SPSS software was done. Out of 40 students selected, 97.5% students have knowledge of reuse of used or disposed off syringes, 75% knows major source of health care waste (HCW), about 92.5% were aware of the blood borne infections that results from improperly disposed off syringes, 52.5% realizes that 3rd world countries do not have specially designed mechanism for health care waste management (HCWM), 82.5% were in opinion of discontinuing same health practices in health care industries and about 100% students showed their willingness to aware people of wrong practices in the community and to spread knowledge about proper disposal of health care waste (HCW). The study reveals that majority of the students of microbiology at the Jinnah University are aware of reuse of syringes and outlook for minimizing wrong health care activities. However, there is a need of comprehensive mass education program regarding sharp waste disposal, not in a single institute but at the grass root level.

Key words: Awareness, health care waste, health care waste management, syringes, sharp waste disposal.

INTRODUCTION

Health care waste is a term used for all waste arising in health care establishments. Syringes used in hospital are sharps; one of the types of risk waste (Ilyas, 2000). It is most frequently used sharp item Khan et al. (2005) with highest disease transmission potential (Khan et al., 2000). Sharps represent about 1% of the total waste from health care activities. The major sources of health care waste are hospitals and other health care establishments, laboratories and research centers, mortuary and autopsy centers, animal research and testing laboratories,

blood banks and collection services, and nursing homes for the elderly where a large amount of healthcare waste is produced in the form of used catheters and syringes etc. Health care waste especially needles and syringes are not always properly disposed off which generates a considerable risk for injury, infection and opportunities for reuse (WHO, 2007). Therefore, syringe disposal without effective waste disposal system opens a new portal of transmission of blood borne pathogens from patients to general community (Liss et al., 1990). Several studies have identified unsafe injections as a major risk factor in outbreaks of blood borne infectious diseases (Hu et al., 1991; Darwish et al., 1993; Farghaly and Barakat, 1993; Hersh et al., 1991).

*Corresponding author. E-mail: shaz2971@yahoo.com.

Worldwide, 8 to 16 million hepatitis B; 2.3 to 4.7 million hepatitis C; 80, 000 to 160, 000 HIV infections are estimated to occur yearly from reuse of syringe needles without sterilization (WHO, 2007). Many of these infections could be avoided if syringes were disposed off safely. The reuse of disposable syringes and needles for injections is particularly common in certain African, Asian and Central and Eastern European countries (WHO, 2007). Hence, injection practices in developing countries are often not safe. The advent of disposable syringes in mid 20th century was considered to overcome the problem of inadequate sterilization practices Drucker et al. (2001), especially in developing countries (Wlivte, 1982; Vander, 1982). However, reuse of needles poses grave health consequences (Vinceni-Ballereau et al., 1989; Narendranathan and Philip, 1993).

In Pakistan also the potential source of HCV and HIV are reuse of syringes, unsafe injections and improper disposal of used syringes. Prevalence of HCV in health care workers is 20% while the risks of infection after a needle stick injury from Hepatitis B positive patient is 30% (www.safeinjections.org/pdf/CIS_Training_Handout_English.pdf). In majority public hospitals, significant number of syringes is reused and large numbers are disposed off without cutting the needle (Riaz et al., 2009). According to a report, management of medical waste in Pakistan is an alarming problem. It is estimated that about half of all injections administered in Pakistan involve reused syringes (Ahmad, 2004). Recycling and repacking of used unsterilized syringes by several small groups is being practiced (Abdul et al., 2003). Most of the used syringes are recycled into plastic items but some are washed and simply packaged for resale (Ahmad, 2004). It is difficult for the public to differentiate between new sterilized syringes and recycled unsterilized syringes. A total of 59% of syringes dumped into the general waste and not properly disposed off in the health care waste. Scavengers seeking valuable things from the waste are at high risk of receiving needle stick injuries from contaminated needles (Ahmad, 2004). In addition, rag pickers mostly children and many of them Afghan refugees or member of the vulnerable groups collect used injection devices and sell them to Kabarjis (persons dealing in sell of old/ used stuff), at a price of 18 to 25 Rs. (40 to 55 cents) per kg (Ahmad, 2004). The lack of proper waste management, lack of awareness about its hazards and insufficient financial and human resources are the problems connected with disposal of medical waste. An essential issue is the clear attribution of responsibility of appropriate handling and disposal of the waste. This responsibility definitely lays on the waste producer, that is, the health care provider or the establishment involved in related activities (Khan et al., 2005).

In 2000, the WHO recommended that countries should implement strategies to change the behavior of health care workers and patients in order to decrease the over-use of

injections, to ensure the practice of sterile syringes and needles, and to properly destroy sharp waste after use (WHO, 2000). In 2002, the results of a WHO assessment conducted in 22 developing countries showed that the proportion of health care facilities that do not use proper waste disposal methods ranges from 18 to 64%. In addition to the public health risks, if not managed, direct reuse of contaminated injection equipment results in occupational hazards to health workers, waste handlers and scavengers. Where waste is dumped into areas without restricted access, children may come into contact with contaminated waste and play with used needles and syringes. Epidemiological studies indicate that a person who experiences one needle stick injury from a needle used on an infected source patient has risks of 30, 1.8, and 0.3% respectively of becoming infected with HBV, HCV and HIV (WHO, 2004).

With this back ground we aimed to determine the awareness regarding reuse of syringes, improper disposal of syringes without proper treatment/decontamination, and its consequences.

SUBJECTS AND METHODS

Study design

A questionnaire based blind study.

Place of study and duration

The study was conducted at Department of Microbiology, Jinnah University for Women, Karachi in first week of August, 2011.

Study participants

A total of 40 students of Microbiology Department were selected for the study on first come first served basis.

Statistical analysis

The questionnaire was designed under the guidelines of World Health Organization with the help of web tools available at "Monkey Survey.com". The data collected through questionnaire was subjected to Statistical Package for Social and Biomedical Sciences (SPSS 12.0) software for statistical analysis.

RESULTS

The survey questionnaire was collected from 40 students. Out of which, 65% students were aware of the picture of the victim of improper syringe disposal, 97.5% students have knowledge of reuse of used or disposed off syringes, 75% knows that major source of health care waste (HCW) are general hospitals while, 22.5% were in opinion of pathological laboratories, 52.5% realizes that 3rd world countries do not have specially designed mechanism for health care waste management (HCWM while, 35% were unsure and 12.5% says these countries)

Table 1. Summary of the findings.

S/N	Questions	Answers	Frequency (count)	Percent
1	Have you ever seen this? (a picture of a victim was shown to the participants)	Yes	19	47.5
		No	12	30.0
		Never	2	5.0
		Quite few times	7	17.5
		Daily	0	0
		Often	0	0
		Total N	40	100.0
2	Are you aware of reuse of used/disposed off syringes?	Yes	39	97.5
		No	1	2.5
		Total N	40	100.0
3	Majority of health care waste comes from	General Hospitals	30	75.0
		Tertiary care hospitals	0	0
		Maternity Homes	0	0
		Clinics	1	2.5
		Cosmetic Surgery Clinics	0	0
		Pathological Laboratories	9	22.5
Total N	40	100.0		
4	Do third world countries have specially designed mechanism of health care waste management?	Yes	5	12.5
		No	21	52.5
		May or may not be	14	35.0
		Total N	40	100.0
5	Are these improperly disposed off syringes main cause of spread of infections like HIV/HBV/HCV etc.?	Yes	35	87.5
		No	0	0
		Sometimes	1	2.5
		Rarely	2	5.0
		In major cases	2	5.0
Total N	40	100.0		
6	Should we continue with same practices in health care industry?	Yes	7	17.5
		No	20	50.0
		Certainly not	13	32.5
		Total N	40	100.0
7	Do we need to aware people about these wrong practices in our community?	Yes	12	30.0
		No	0	0.0
		Surely 100% yes	28	70.0
		Total N	40	100.0
8	Are we ready to spread the knowledge about proper disposal of health care waste?	Yes	39	97.5
		No	1	2.5
		Total N	40	100.0

do have special mechanism for HCWM, about 92.5% were aware of the blood borne infections that results from reuse of used or improperly disposed off syringes, 82.5%

believed on discontinuation of same health practices in health care industries, and about 100% students showed their willingness to make aware people of wrong

Table 2. Chi-square test with SPSS to determine the statistical significance of the findings.

Question No.	Aware students	Chi-square (a)	P-Value
1	26 (65%)	5.0	0.011
2	39 (97.5%)	36.1	0.000
3	30 (75%)	10.0	0.000
4	21 (52.5%)	0.1	0.752
5	37 (92.5%)	28.9	0.000
6	33(82.5%)	16.9	0.000
7	40 (100%)	-b	-b
8	39 (97.5%)	36.1	0.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 20.0;

b. This variable is constant. Chi-Square Test cannot be performed.

practices in the community and to spread knowledge about proper disposal of health care waste (HCW) among the community (Table 1). Chi-square test with SPSS software was applied to test the validity of the summary measures. The p-value is 0.000 in most of the cases showing its statistical significance while in one case chi-square cannot be performed due to constant variable (Table 2).

DISCUSSION

The study outcomes gave us some impression about the level of awareness of syringe reuse among the students of microbiology major. As the results have shown that majority of students have good profile of knowledge regarding reuses of syringes and its consequences. The p-value with Chi-square shows that our findings are statistically significant and it rejects the hypothesis that majority of the students are unaware of reuses of syringes. However, the p-value for the question no. 4 differ significantly which asked about the specially designed mechanism of health care waste management (HCWM) in third world countries. Students are little unaware in this regard. While Chi-Square test for question No.7 cannot be performed because of the constant variable that is, 100% students were in opinion of the question and 0% were not. The level of knowledge among students is good but study on large scale is required to quantify the significance of the problem. Professional organizations as Pakistan Medical Association (PMA), Pakistan Society for Microbiology (PSM), Bio-safety Association of Pakistan (BSAP), and government itself, could play a vital role in arranging continuing medical education seminars and ensuring GPs (General Practitioners) participation in them. Online training courses could be of much value because of their time flexibility (Janjua, 2003). Subjects related to bio-safety and bio-security must be introduced, to enable students a better understanding on the subject of health safety. It is also recommended to start basic health safety

education programs and campaigns through mass media. We can also manage to arrange symposiums/ videos/ lectures for school and college students who are our future. Moreover, government should take some serious actions in this regard. The goal for safe disposal of the sharps can be accomplished by instituting a system and creating awareness among health professionals. Involvement of the professional bodies may be very fruitful and binding them by legislation not to throw their waste that can harm others is necessary. The reuse of disposable syringes is a major problem in the developing countries, especially where the supplies are limited so there would be some element of reuse as pointed out in studies from Karachi (Battersby et al., 1999; Khan et al., 2000). Although a bill has passed in Sind Assembly which aims at controlling the manufacturing, selling and use of used syringes by suggesting a penalty of at least two year imprisonment and Rs. 0.5 million fines for the violator of law Ramzan (2011). But still, implementation on country level is required.

REFERENCES

- Abdul MS, Adil MM, Altaf A, Hutin Y, Luby S (2003). Recycling of injection equipment in Pakistan. *Infect. Cont. Hosp. Epidemiol.*, 24: 145-146.
- Ahmad K (2004). Pakistan: A cirrhotic state? *Lancet*, 364: 1843-1844.
- Battersby A, Feilden R, Nelson C (1999). Sterilizable syringes. Excessive risk or cost effective option? *Bull. World Health Org.*, 77(10): 812-819.
- Darwish MA, Raouf TA, Rushdy P, Constantine NT, Rao MR, Edelman R (1993). Risk factors associated with a high seroprevalnce of hepatitis C virus infection in Egyptian blood donors. *A J. Trop. Med. Hyg.*, 49: 440-447.
- Drucker E, Alcabes PG, Marx PA (2001). The injection century: massive unsterile injections and the emergence of human pathogens. *Lancet.*, 358: 1989-92.
- Farghaly AG, Barakat RM (1993). Prevalence, impact and risk factors of hepatitis C infection. *J. Egypt Pub. Hea. Ass.*, 68:63-79.
- Hersh BS, Popovici F, Apetrei RC, Zolotusca L, Beldescu N, Calomfirescu A, Jezek Z, Oxtoby MJ, Gromyko A, Heymann DL (1991). Acquired immunodeficiency syndrome in Romania. *Lancet*, 338: 645-649.
- Hu DJ, Kane MAA, Heymann DL (1991). Transmission of HIV, hepatitis B virus, and other blood borne pathogens in health care settings: A

- review of risk factors and guidelines for prevention. *Bull. World Health Org.*, 69: 623-630.
- Ilyas M (2000). Hospital and Biomedical Waste Management. *Community Medicine & Public Health*. 5th ed. Karachi: Time Publishers., pp. 621-623.
- Janjua NZ (2003). Injection practices and sharp waste disposal by general practitioners of Murree, Pakistan. *J. Pak. Med. Assoc.*, 53: 107-111.
- Khan AJ, Luby SP, Fikree FF (2000). Unsafe injections and transmission of hepatitis B and C in a Periurban Karachi, Pakistan. *Bull. World Health Org.*, 78: 956-963.
- Khan AJ, Luby SP, Fikree FF (2000). Unsafe injections and transmission of hepatitis B and C in a Peri-Urban Karachi, Pakistan. *Bull World Health Organ.*, 78: 956-63.
- Khan MH, Khan H, Basit A, Ikramullah, Babar ST, Habib H (2005). Sharp waste disposal practice among general practitioners. *Gomal J. Med. Sci.*, 3(1): 2-5.
- Liss GM, Crimi C, Jaczek KH (1990). Improper office disposal of needles and other sharps: An occupational hazard outside of health care institutions. *Can J. Public Health*, 81: 417-420.
- Narendranathan M, Philip M (1993). Reusable needles- a major risk factor for acute virus B hepatitis. *Trop. Doct.*, 23:64-66.
- Ramzan C (2011, January 13). SA Okays bill to curb re-usage of syringes. *The Nation*. Retrieved from <http://www.nation.com.pk>
- Riaz R, Sultana A, Tehseen I (2009). Malpractices in syringe disposal by paramedical staff. *Rawal Med. J.*, 34:176-179.
- Vander GS (1982). The illegal distribution of western medicine in developing countries pharmacists, drug peddlers, injection doctors and others: A bibliographic exploration. *Med. Anthropol.*, 4:197-219.
- Vinceni-Ballereau F, Lafaix C, Ilaroache G (1989). Incidence of intramuscular injections in rural dispensaries in developing countries. *Trans R Soc Trop. Med. Hyg.*, 83: 106.
- Wlivate SR (1982). Penicillin, battery acid and sacrifice: Cures and Cures in Nyoles medicine. *Soc. Sci. Med.*, 16: 2055-64.
- World Health Organization. (WHO). Health care waste management fact sheet no.281, October 2004.
- World Health Organization. (WHO). Unsafe Injection Practices Having Serious Large-Scale Consequences. Press Release WHO/14. Geneva: WHO., 2000: 1-20.
- World Health Organization. (WHO). Wastes from health care activities fact sheet no.253, November 2007.