Methods of disposal of used syringes by Hepatitis B and C patients at an urban and rural setting

Haris Riaz,[1] Syed Wajahat Kamal,[2] Talha Riaz,[3] Sina Aziz,[4] Jamila Rajper,[5] Wajiha Noorulain[6]
5th Year Students, Dow Medical College,[1,2] House Officer,[3] Paediatric Unit-I,[4] Postgraduate Students, Med-4,[5,6] Civil Hospital, Karachi.

Abstract

Objective: To evaluate the methods of disposal of used syringes employed by patients with hepatitis B and hepatitis C.

Methods: This cross sectional study was conducted at a tertiary care hospital of Karachi and a clinic at Khairpur, Sindh. Diagnosed cases of Hepatitis B and C currently receiving treatment in the form of Interferon alpha injection were included by convenient sampling. The study instrument was a well structured questionnaire meant to ascertain the disposal methods of used syringes once they had been employed for treatment purpose. Open-epi sample size calculator (Multi-purpose statistical software for calculation of the sample size) and SPSS 15.0 was used for data entry and analysis.

Results: A total of 203 patients were interviewed, 147 from Karachi and 56 from interior. The majority i.e. 164 were suffering from Hepatitis C, 27 from Hepatitis B and 2 were co-infected with Hepatitis B and D. The mean age of patients was 35.8 ± 11.5 years. Regarding disposal of injections, the most frequent mode was disposal of used syringes in house trash i.e. 71 (37.4%), patients 46 (24.2%) responded that they utilized a needle cutter, 37 (19.5%) safety box (disposal method in tertiary hospitals where the needle is disposed off safely in a box), 12 (6.3%) disposed in sewage, 3 (1.6%) disposal in water, 3 (1.6%) buried the used syringes, while 2 (1.1%) reused the syringe and needle once they had been used for therapeutic purposes.

Conclusions: The study suggests that the injection practices by the majority of patients suffering from viral hepatitis were unsafe. Majority of the patients were disposing the used syringes and needles in the house trash.

Keywords: Hepatitis, Disposal of syringes, Urban and rural patients (JPMA 62: 81; 2012).

Introduction

Hepatitis B, C and D are a huge public health burden with hepatitis B alone effecting 350 million people across the world[1] making it the tenth leading cause of death.[1,2] It causes approximately 0.5-1.2 million deaths per annum.[3,4] Four million in United States are chronically infected with hepatitis C making it the most common blood borne pathogen. Hepatitis is particularly endemic in Asia especially Middle East and Indian sub-continent with majority of individuals becoming infected during childhood.[5]

The routes of transmission are blood transfusions, sexual intercourse, vertical transmission and by syringes, including IV drug abuse and accidental needle pricks. With the advent of modern screening techniques the spread of virus via transfusion is declining markedly.[6] In European and American continents most HBV infections are acquired through sexual activity or IV drug abuse.[7] Injectable drug use accounts for almost all new cases of Hepatitis C in United States.[8,9] In 1990, a survey was conducted on disposal of syringes by diabetics which showed that 93% disposed the injectables in trash and 4% in toilets.[10] The disposal of used material in household trash was more frequently practiced by self injecting patients as compared to those who receive injections by other persons.[11]

The inappropriate disposal of syringes resulting in the use of unsafe injections poses a menace to health especially in developing countries.[12] A survey conducted in the central region of France in 2001 and 2002 revealed that among the patients who frequently discarded needles in the household waste, the ratio of the uninformed patients to those who were educated about the disposal recommendations was almost twice.[11] It has been estimated that contaminated needles cause 8-16 million HBV infections each year along with 2.3-4.7 million Hepatitis C.[13]

These facts indicate the necessity that along with efficacious treatment and mass immunization programmes, efforts are needed to ensure that the utilized syringes are discarded properly and safe injection techniques are utilized for eliminating hepatitis and hence reducing global mortality.[14] The present study attempts to elucidate the injection practices of patients of viral hepatitis from urban and rural Sindh.

Methodology

This is a descriptive cross sectional study conducted at a

tertiary care centre i.e Civil Hospital Karachi and a clinic located in the interior of Sindh. The study period was 3 months extending between January and March, 2010.

In Civil Hospital Karachi a specialized unit meant to deal with cases of hepatitis was utilized for data collection. Being a government tertiary care setting, patients mostly of lower socio-economic strata visit the setting, not only from Karachi but also from far flung areas. The majority of visits are meant for the treatment of Viral Hepatitis B and C.

The other centre was a clinic, located for treatment of viral hepatitis in Khairpur, Interior of Sindh. Here also, people of under-privileged segments of society visit for treatment. This centre represented our rural population.

All the patients of viral hepatitis B and C who were receiving treatment in the form of injections/syringes of Interferon alpha for at least one month in the above mentioned centres were included. These patients were diagnosed through serological assays. Diagnosed cases of Hepatitis B and C not receiving the injectable therapy were excluded.

Sample size was calculated by using open-epi sample sample size calculator (a software for epidemiological purposes), considering p= 89%,[11] probability of error=5% and Confidence Interval as 95%, the sample size was estimated to be 151.

The study instrument was a well structured questionnaire meant to ascertain the means employed by the patients visiting the above mentioned urban and rural centres for disposal of injectables once they had been utilized. Besides demographic data such as age, gender, education and the centre at which the visit was being made, the other pertinent data collected included the information regarding disposal of syringes and whether any knowledge was given to patients regarding the safe removal of syringes. The relevant answer was ticked in the form or added in the "Others" space.

A pilot study was initially carried out on 15 patients to address any probable short comings, however no change was deemed necessary. Patients in Civil Hospital were interviewed by students of Dow Medical College in Urdu while those of Interior Sindh by the health personal in Sindhi. Both the students and the health personal (MBBS doctors) received training for the completion of the forms by the investigators of the project and a small pilot study study was done prior to actual collection of the data.

The ethical approval of the study was undertaken by the Ethical Review Board of Dow University of Health Sciences (currently named as Institutional Review Board). Every effort was under-taken to ensure complete anonymity of patients and prior informed and written consent was taken for inclusion in the study.

Statistical package for social sciences (SPSS 15) was used for data entry and analysis. For continuous variables, results are presented as mean + SD (Standard Deviation). Chi square test was applied for categorical variables and p value of 0.05 or below was considered significant.

Results

A total of 203 patients were included in the study of

Table-1: Illustrates the impact of different factors on the methods employed by the participants.

	Methods employed by participants for disposal of needles										p value
	General house trash	Bringing back to hospital	Burn it	Give it to others	Reuse it	Bury it	Use needle cutter	Dispose in sewage	Dispose water	Use disposable safety box	
Education:											
Illiterate	35	2	6	2	0	3	20	8	0	12	0.014
(n=88)	(39.8%)	(2.3%)	(6.8%)	(2.3%)	(0.0%)	(3.4%)	(22.7%)	(9.1%)	(0.0%)	(13.6%)	
Undermatric	18	4	2	0	2	0	18	4	3	15	
(n=66)	(27.3%)	(6.1%)	(3.0%)	(0.0%)	(3.0%)	(0.0%)	(27.3%)	(6.1%)	(4.5%)	(22.7%)	
Matric	6	0	0	0	0	0	5	0	0	0	
(n=11)	(54.4%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(45.5%)	(0.0%)	(0.0%)	(0.0%)	
Intermediate	10	0	0	0	0	0	0	0	0	2	
(n=12)	(83.3%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(16.7%)	
Graduate	2	0	0	0	0	0	3	0	0	8	
(n=13)	-15.40%	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(23.1%)	(0.0%)	(0.0%)	(61.5%)	
Prior information about disposal of needles:											
Yes	18	4	4	2	0	3	42	4	3	20	<0.001
(n=100)	(18.0%)	(4.0%)	(4.0%)	(2.0%)	(0.0%)	(3.0%)	(42.0%)	(4.0%)	(3.0%)	(20.0%)	
No	53	2	4	0	2	0	4	8	0	17	
(n=90)	(58.9%)	(2.2%)	(4.4%)	(0.0%)	(2.2%)	(0.0%)	(4.4%)	(8.9%)	(0.0%)	(18.9%)	
Participants interviewed at:											
Civil Hospital Karachi	37	6	4	2	0	3	44	8	3	27	<0.001
(n=134)	(27.6%)	(4.5%)	(3.0%)	(1.5%)	(0.0%)	(2.2%)	(32.8%)	(6.0%)	(2.2%)	(20.1%)	
Interior Sindh	34	0	4	0	2	0	2	4	0	10	
(n=56)	(60.7%)	(0.0%)	(7.1%)	(0.0%)	(3.6%)	(0.0%)	(3.6%)	(7.1%)	(0.0%)	(17.9%)	

Table 2: Depicts the differences in the prevalence of different types of hepatitis among the participants from rural and urban areas.

Place of Interview	Participants being treated for			p value
	Hep B	Hep C	Hep B + Hep D	
Civil Hospital Karachi (n=137)	11 (8.0%)	124 (90.5%)	2 (1.5%)	0.001
Khairpur District (n=56)	16 (28.6%)	40 (71.4%)	0 (0.0%)	

which 100 (49.3%) were males whereas the rest 103 (50.7%) were females. Out of the 203; 147 were interviewed at Civil Hospital, Karachi, while the rest 56/203 were interviewed from a government hospital in Khairpur District, Sindh. The mean age of patients included in our study was 35.8 (± 11.5 years). Regarding etiology, 27 (14%) patients were infected with Hepatitis B, whereas 164 (85%) patients were receiving treatment for Hepatitis C. Only 2 (1%) patients were co-infected with Hepatitis B and D. About, 167 (82.3%) of the patients revealed that either they did not go to school at all, or had education below the tenth grade. Out of the 17.7% patients who were educated to the tenth grade or above, 13 (6.4%) were graduates. Interestingly, education trend was similar in urban and rural sub-groups with approximately four-fifths educated to matric or below in either group.

Regarding administration of injections in the urban group, 70 (47.6%) of patients received their treatment from the doctors while 47 (31.9%) from the paramedical staff. The rest 30 (20.4%) received injections from their family members. In rural group, 21.4% of patients received injections from doctors while 21.4% from paramedical staff and 32 (57.1%) patients were injected by their family members.

When asked about the means employed for disposal, 71 (37.4%) revealed that they dispose off the syringes in the general house trash. The percentage was significantly greater (p=<0.01) in the rural group (60.7%), compared to the urban (27.4%) patients.

A total of 44 (32.8%) and 27 (20.1%) patients from CHK, while 2 (3.6%) and 10 (17.9%) from Khairpur District responded that they utilized needle cutters and safety boxes respectively for the removal of injections. As far as other disposal practices are concerned, a total of 6 (3.2%), all from civil hospital said that they bring back the syringes to hospital, 8 (4.2%) claimed that they burn the injectables after consumption, 2 (1.5%) said that they give it to some other patient or utilize, 3 (1.6%) bury it, 12 (6.3%) dispose off in sewage. Table-1 illustrates in detail the effects of various factors on the methods adopted by the participants to dispose off used syringes.

Discussion

Transfusion transmitted infections such as viral hepatitis and HIV have shown a decline in the developed world owing to improved screening techniques and superior surveillance measures to address the condition.[13,15] As the spread through sexual and vertical means continues to decrease, transmission by injectables assumes an increasingly greater role. WHO estimates that unsafe injections account for 30% and 31% of Hepatitis B and C infections worldwide.[16]

A number of studies conducted in west have emphasized the importance of safe removal of injectable wastes and the methods employed by the patients in this regard.[6,10-14] However, despite the burden of disease in our part of the world, there is paucity of published medical literature pertaining to the above mentioned. To the best of authors' knowledge, this is the first study highlighting the disposal methods of injectables by Hepatitis B and C patients from Pakistan.

The assessment of results in our study suggests that the injection practices differ in urban and rural patients. However, the means employed for the removal by a substantial percentage in both the groups is potentially dangerous for the community. Approximately two-fifths of the patients from the urban group, whilst four-fifths from the rural discard the syringes in a way which causes exposure to community. Injections are widely used in the developing nations for several reasons such as patient's beliefs. A person on average receives 1.5 injections per annum. Most of these are for un-necessary therapeutic indications.[12] A study suggests that the average number of injections received by per person per annum is 8.5.[17] The average number of injections received by patients suffering from HIV, Hepatitis B and Hepatitis C is 10 to 100 times higher.

According to the World Health Organisation (WHO), a safe injection is the one which does not harm the recipient in any respect, or cause any preventable risk to the one who administers it and the waste resulting from the disposal of it is harmless to community.[18] Around half of patients interviewed from Karachi replied that "needle cutters" or "Disposable safety box" is employed by them for the disposal of syringes after using them for therapeutic purposes. These were supplied from the centre at CHK, where they were receiving treatment. The corresponding percentage in those interviewed from interior Sindh was disappointingly low (21.5%). Several factors could account for such a variation. Majority i.e. 71% patients from the urban group replied that they were counselled about the harmless removal of injectable wastes in comparison to 3.5% from the rural group. The proportion of patients receiving injections by doctors or paramedical staff was almost double in urban population compared to rural (81.5% compared to 42.8%). Interestingly, the most common person administering injections in rural patients was from the family members. The education of patients in both the groups was uniformly low (close to 80%). Demographic factors such as age and gender did not have any significant association with the means for removal of injections. Our results

are similar to those obtained from developing nations. A review from 19 developing nations showed that almost half of all injectables are disposed unsafely.[12]

A study carried out in Cambodia highlighted that overuse and misuse of injections carries a substantial risk of HIV, HBV and HCV.[19] This study also showed that faulty aseptic technique due to used sharps left in injection preparation area may facilitate cross infection.

A population based study carried out in Pakistan suggests that unsafe injections are a major source of transmission of Hepatitis C.[20] Population based estimates further suggest that a very high percentage of hepatitis B, ranging from 20 to 67% could be attributed to unsafe injections.[12]

Through extensive literature search from pubmed, we did not find any study evaluating the removal of injectable practices by the sufferers of Viral hepatitis, therefore we believe that this is the first study of its kind. Evaluation of such practices demonstrate an important method of spread in our community. The inclusion criteria ensured that only the patients under treatment were included, therefore, this represents the actual scenario in our community. The study compares urban with rural population, representing strata derived from different settings. Interviewing patients currently receiving treatment ensures that the recall bias from the patients is reduced to minimum. Due to a very high number of injections received, such patients contribute to a significant burden of syringes handled by any community.

The limitations included a modest sample size of patients and the fact that the patients interviewed from the city were almost twice compared to the rural setting. We did not ascertain whether the patients interviewed from Karachi were actually inhabitants of the city as being a tertiary referral center, patients from remote areas also visit the hospital as mentioned above. However, previous studies similar to our's have shown that the cultural background of the patients attending the centre in CHK was the same.[21]

Conclusions

Injection practices i.e. disposal of used syringes by the patients with Hepatitis in urban areas were better than that of rural areas.

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