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Injection practices and sharp waste disposal by general practitioners of Murree, Pakistan

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Abstract

Objective: To describe the injection and sharp waste disposal practices of genera! practitioners of Murree, Pakistan.
Methodology: In-depth interviews of all general practitioners available between 10th to 20th July 2000 were conducted. Practitioners were interviewed about injection administration and disposal of waste due to injections and other sharp material.
Results: Twenty general practitioners out of 25 were interviewed. All claimed using disposable syringes only once. None of them was disposing off syringes in sharp containers in the clinic. Of 20, 12 (60%) were throwing syringes at open places and 5 (25%) in municipal waste bins. Most of the injections by general practitioners were administered for fever, body aches, diarrhea and respiratory tract infection.
Conclusion: Sharp waste disposal is not safe in Murree. Improper disposal of sharp waste needs development of cost effective methods that are applicable at a small scale. Larger studies are required to quantify the gravity of the problem (JPMA 53:1 07;2003).

Introduction

Injection overuse has been well documented in the developing world, since the use of injections in mass eradication campaigns against Yaws, Kalazar and other infections in the early and mid 20th century.[1-4] The injections were administered for various reasons.[5] Some of these being that injections are presumed to be more rewarding economically, patients demand injections for rapid recovery from disease, promotion of injections by providers as a means to reduce non-compliance and aggressive promotion of injections by pharmaceutical companies.[2.5]
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[6], especially in developing countries.[7.8] Nonetheless, reuse of needles poses grave health consequences.[9,10] Transmission of hepatitis B virus (HBV)[11,12] hepatitis C virus (HCV)[13,14] and human immunodeficiency virus (HIV)[15-17] through contaminated injection equipment has been reported by various studies throughout the world. It is estimated that every year unsafe injections may infect 96,000 people with I-IIV and more then 21 .7 million people with Hepatitis B, and two million with hepatitis C virus.[18]
The improper disposal can also lead to transmission of infections to the general population.[19.20] The use of disposable syringes requires a proper disposal system.[21] Disposable syringes are considered to be at high risk among the other syringe technologies. This signifies the risk of blood-borne pathogen transmission from patient to patient, patient to healthcare workers (HCW) and patient to general community due to highest potential for compromised safety at each stage.[20] The volume of waste generated

by use of disposable syringes is very large and unguarded than sterilizable and auto-disable syringes. Proper disposal through incineration is costly and infrastructure is not present in most of the developing countries.[22] A study conducted in Mwanza Region of Tanzania reported that in most of the healthcare facilities, rubbish pit was used for disposal of the discarded syringes and needles and these rubbish pits were so shallow, that used syringes could be retrieved from them easily. Some of the health facilities disposed off the syringes in the latrine.[23] None of these practices are adequate. Risk of transmitting blood-borne disease depends on the local injection practices, number of injections an individual received, prevalence and transmissibility of blood-borne organisms.[24,25] When the syringes are not disposed-off properly by burning (destructive incineration) or burying. patient to community transmission of infection can occur.[22]
No recent population based estimates for prevalence of hepatitis B and C are available in Pakistan. the previous studies[26] and studies on blood donors[27] suggested that the prevalence of both pathogens ranged from 2-10%.[28,29] Therapeutic injections administered in health care settings have been consistently reported as a major risk factor for hepatitis B and C from Karachi[30,31], Hafizabad[26] and Rawalpindi.[32] This transmission could have been the consequence of overuse and poor injection practices.
It is highly desirable to know the injection practices and sharp waste disposal adopted by the general practitioners, who are the major health care providers to the general community.

Material and Methods

A cross-sectional survey of general practitioners in urban and rural areas of Murree, Pakistan was conducted in the summer of 2000. Murree is a sub-district about 50 km to the north of the capital Islamabad with a population of 150,000 people. Health care is provided by the public basic health units and a Tehsil headquarter hospital in Murree, general practitioners and few dispensers.
All practitioners working in the area were contacted by telephone between 10th to 20th July 2000 and requested for participation in the study. The purpose of the study was explained and verbal consent was obtained. None of the doctors contacted, refused to participate in the study. Those not found on the first day were contacted twice. Five practitioners could not be reached.
The study participants were interviewed using a semi-structured questionnaire. They were asked about the most frequent presenting complaints of the patients, proportion of their patients who received injections, opinion regarding injection as component of routine treatment, type of syringes used by them, type of injectable used, reuse of syringes by their dispensers. qualifications of their dispensers, syringes disposal in the clinic and out side the clinic. They were also questioned on sterilization of instruments for minor procedures and opinion about the waste disposal.
The data was edited and quantitative responses were entered in Epi Info Version 6.0 (CDC, USA; WHO) and analysis was conducted using Epi Info 6.0. The practices of rural and urban doctors were compared by using chi square test and fisher exact test.

Results

All general practitioners had a minimum qualification of MBBS. Mean (±SD) age of practitioners was 36(±9) years and mean (±SD) duration of professional practice was 9 (±5) years. Of 20 doctors 13 (65°/o) had their clinic in the villages and 7 (35%) in Murree City. Five most frequent complaints at presentation were diarrhea (I 100%). Confidence interval sore throat and other respiratory tract infections (100%), fever (100%) weakness and body aches (1000/0), skin infections and allergies (70%) and arthritis (30%).

Sixteen (80%) of the general practitioners were giving injections to every patient and 53% and 28% in rural and urban area reported preference for injection as an essential component of treatment respectively. The reason for injection being an essential component of treatment, was patient's demand for them. All claimed to use the disposable syringe only once. Dispensers did not have any formal qualification in any clinic. They learnt, the injection administration technique and medicine dispensing by working in clinics. Reasons for not having trained dispensers were non-availability of trained staff. The trained staff of the public health care facilities run their own clinics in the evening. All were using multi dose vials for medications. None of the practitioners were using separate syringes for drawing and injecting purposes.

Regarding disposal of syringes and other waste, use of sharp containers and cutting needles were negligible. Used syringes were mostly thrown in a common basket kept in the clinic.

Open space near the clinic is the common site 12(60%) for the final disposal of such clinic waste (Table 1).

Table 1. Syringes disposal by GPs in Murree, Pakistan 2000

Disposal place	n	%
Community Waste bin	5	25
Open Place	12	60
Burning in pit	1	5
Throwing in pit openly	2	10
Total	20	100

Three (15%) of 20 GPs claimed using autoclave for sterilizing instruments, rest were washing with water or cleaning with methylated spirit (Table 2).

Table 2. Methods of sterilization of instruments by GPs in Murree, Pakistan 2000 (n=20).

Practices	n	%
Boiling	2	10
Cleaning with spirit	4	20
Washing	9	45
Boiling and autoclaving	3	15
Not applicable*	2	10

*Do not use any instrument that needs sterilization.

When the practices of the rural GPs are compared with the GPs working in Murree city significant difference was found only in the disposal of waste and sterilization of instruments. Those in the city disposed off their waste in the municipal waste bin, while those in villages at open places. In the city most (7 1%) of the doctors sterilized their instrument by boiling and autoclaving while in villages washing and cleaning with spirit was the routine method (Table 3).

Table 3. Comparison of rural and urban injection practices in Murree, Pakistan 2000 (n = 20).

Practices	Rural (n = 13)		Urban (n =7)				
	n	%	n	%	OR	95% CI	p-value†
GP giving injection to every patient	13	100	3	43			0.007**
Administration of injection necessary component of treatment	7	53	2	28	2.92	0.29-34.27	0.272
Needle cutting	1	7.6	3	42	0.11	0.00-2.07	0.100
Disposal of waste openly / community waste bin	13	100	2	28			0.001**
Non-sterilization of instruments	13	100	5	71			0.111

† Fisher exact test

** P-value significant

OR: Odds ratio, CI: Confidence interval

A large proportion (55%) of practitioners were unaware of the safe method of sharp disposal while 30% proposed incineration but also pointed out that it is not cost-effective

(Table 4).

Table 4. Proposals by GPs for waste disposal in Murree, Pakistan 2000.

	n	%
Incineration	6	30
Doctor does it by cutting and incinerating	2	10
Needle cutting	1	5
Don't know what to do	11	55

Discussion

The study highlights and reinforces the overuse of therapeutic injection and unsate disposal ot sharp waste in general practice.

Injection administration to most of the subjects presenting for treatment at the clinics and preference for injectable treatment, are leading to overuse of injections. Injection overuse by the private general practitioners has been reported from various countries including Uganda[34]. Tanzania[23] and India.[12] The belief of general practitioners that their patients want injections without asking them could be one reason for injection overuse[35-36], besides the economic incentives associated with injection administration. Private practitioners administer injections. as by providing injections they can earn more money[37] and their supply can easily be controlled as compared to oral drugs. While prescribing oral drugs there is always a risk of bypassing the physicians by purchasing prescription drugs for the same or similar episodesin future without consultation.[38.39] Private sector doctors can control the supply of the injectables more easily thati oral drugs since it is less likely that the patient will know the name of injectables and therefore cannot compare the price with other practitioners. For the injection the patient is dependent on the doctor or dispenser cannot get it without their help, procuring and using oral drugs is not difficult.[37]

Using a disposable syringe for every patient prevents the patient-to-patient transmission of hepatitis B and C. However, syringe disposal without effective waste disposal system opens a new portal of transmission of blood borne pathogen from patients to general community.[40] Disposal of used injection equipment at open place in rural areas could increases the risk of transmission to children, who play with syringes and can get pricked. The situation is not very different in the city where most of the doctors dispose off syringes in the municipal waste bin. This exposes the waste scavengers to the risk of hepatitis transmission. The risk is not limited to the waste scavengers but to the other people who are involved in trade of used medical disposable equipments. The situation of waste disposal in rest of the developing world is not different from that found in our study. A study in rural India reported disposal of syringes in the drains or was thrown openly.[36] Another study in Tanzania also reported disposal of syringes in rubbish pit and

latrine.[23]
The knowledge of practitioners about the safe disposal methods of used syringes was scanty. Only 30% of the practitioners reported incineration as a safe method for sharp disposal. Lack of knowledge highlights the deficiency of medical colleges' curricula and importance of ongoing training and refreshers for general practitioners to enhance their knowledge about patient care as well as the safe work practices. Professional organizations as Pakistan Medical Association and government could play a vital role in arranging continuing medical education seminars and ensuring GPs participation in them. Online training courses could be of much value because of their time flexibility.
Another important aspect of sharp waste disposal is the absence of system for safe disposal. The individual clinics may not be able to afford or have motivation to buy an incinerator. In such a situation, central incineration managed by the public waste management agency, could be a more cost-effective option. With the installation of central incinerator, a system of sharp waste collection and transportation can be designed and integrated with the existing system of municipal waste collection. The cost of such a system can be shared between the healthcare facilities and the government.[41] 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. However the establishment of the system could be the first crucial step.
The low reuse rate of syringes could be due to deliberate low reporting by practitioners. 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 in Karachi[20,30]

Conclusion and Recommendations

General practitioners in Murree prefer the injectable therapy that substantiate to the large volume of sharp waste. Disposal of this waste at open spaces exposes the people to the risk of transmission of infectious agents. There is a need to devise a safe and cost effective waste disposal method that is feasible at the GP clinic level. Installation of central incineration and institution of waste collection and transportation system for processing of sharp waste from general practitioner's clinics needs immediate attention.

References

1.Reinford CE. Influence of fifty years of scientific medicine on belief and customs in Gold Coast. WAft Med J 954:3:115-20.
2.Wyatt HV. Popularity of injections its third world: origin and consequences of poliornyelitis. Soc Sci Med 984: 19:911-15.
3.Reeler AV. Injections: a fatal attraction Soc Set Med 1990: 31:119-25.
4.Michel JM. Why do people like medicines? A perspective from Africa. Laticet 1985.i:210-11
5.Reeler AV. Anthropological perspectives on injections: a review. Bull World Health Orgn 2000:78:135-43.

6.Drucker E, Alcabes PG. Marx PA. The injection centuty: massive unsterile iitjections and tite emergence of human pathogens. Lancet 2001: 358: 1989-92.
7.Wlivte SR. Penicillin, battery acid and sacrifice: Cures and Cures in Nyoles medicine. Soc Sci Med 1982:16:2055-64.
8.Van der Geest S. The illegal distribution of western medicine in developing countries pharmacists. drug peddlers, injection doctors and others: A bibliographic exploration Med Anthrop 1982:4: 197-2 19.
9.Vinceni-Ballereau F, Lafaix C, Ilaroache G. Incidence of intramuscular injections in rural dispensaries in developing countries. Trans R Soc Trop Med Hyg 1989; 83:106.
10.Narendranathan M. Philip M. Reusable needles- a major risk factor for acute virus B hepatitis. Trop Doct 1993:23:64-6.
11.Hutin Y, Harpaz R. Drobeniuc J, et al. Injections given in healthcare settings as a major source of acute hepatitis B in Moldova. Int J Epidemiol 999. 28 782-786.
12.Singh J. Gupta S. Khare S. et al. A severe and explosive outbreak of hepatitis B in a rural population in Sirsa district. Haryana, India' unnecessarv therapeutic injections were the major risk factors Epidemiol Infect 2000:125:693-9.
13.Pasha 0, Luby SP, Khan AJ, et al. House hold members of hepatitis C virus infected people in Hafizabad, Pakistan: infection by injections from healthcare providers. Epiderniol Infect 1999:123:515-18.
14.Frank C, Moharned MK, Strickland GT. et al. The role of parenteral antischistosoinal therapy in the spread of hepatitis C virus in Egypt. Lancet 2000:335:887-91.
15.Hersh BS, Popovici F, Jezek Z, et al., Risk factors for HIV infection among abandoned Rornanian children. AIDS 1993:71617-24.
16.Quigley M. Munguti K, Grosskurth FL. et al., Sexual behavior patterns and other risk factors for HIV infection in rural Tanzania; a case-control study AIDS 1997:11:237-48.
17.Quigley, MA, Morgan D, Malainba SS et al. Case-control study of risk factors for incident HIV infections in rural Uganda. J Acquir Immune Defic Syndr 2000;23:41 8-25.
18.World Health Organization. Injection Safety fact sheet No. 231 Geneva. WHO, 2002.
19.A safe injection does no harm to recipient, does not expose the health worker to avoidable risk and poses no threat to the third party.' Report of the WHO TECHNET meetitig, Washington DC. 31 May -4 June 1994 Geneva WHO. 1994.
20.Battersby A. Feilden R, Nelson C. Sterilizable syringes. excessive risk or cost-effective option? Bull World Health Organ 1999:77812-19.
21.Bhattarai MD. Wittet S. Perception about injections and private sector injection practices in Central Nepal. General Welfare Prastisthan and Gates. URL; www.childrensvaccines file/Children's vaccin Programme at PATH. 2000. Nepal Inject Practices RA pdf
22.Aylward B, Lloyd j, Zaifran M, et al. Reducing risk of unsafe injections in immunization programmes: financial and operational implications for various injection technologies. Bull World Health Organ 1 995 ;73 :531-40
23.Gumodoka B. Vos j, Berege ZA, et al. Injection Practices in Mwanza Region. Tanzania: prescriptions, patient demand and sterility. Trop Med Int Health 1996:1:874-80.
24.Aylward B, Kane M, McNair-Scott R. et at. Model based estimates of risk of traiismitting HIV and Hepatitis B through unsafe intections. Int .t Epidemiol 1995,24:446-52.

25.Mullan Rj, et at. Guidelines for prevention of transniission of WV and Hepatitis B to health care and Public safety workers. MMWR I989,38(S-6)3 37.
26.Luby S. Qamruddin C, Shah A. et al. The relationship between therapeuiic injections and high prevalence of hepatiiis C infection in t-latizabad, Pakistan Epideiniol Infect 1997:119:349-56.
27.Mujeeb SA. HVC, and HBV infections in Karachi, Pakistan. lit: 18th Gastroenterology Congress 2002 Karachi, Pakistan May 2-5, 2002.
28.Zuberi SJ. Seroepiderniology of HBV and HCV in Pakistan International Hepatalogy Communications. 996: 5:19-26.
29.Parker SP, Khan IH, Cubitt WD. Detection of antibodies to hepatitis C virus in dried blood samples from mothers and their offspring in Lahore. Pakistan. J Clin Microbiol. 1999;37:2061-3.
30.Khan AJ, Luby SP, Fikree FF, et al. Unsafe injections and transmission of hepatitis B and C in a Peri-Urban Karachi, Pakistan. Bull World Health Organ 2000:78:956-63.
31.Raza H, Akhtar S, Rahbar MH. et al. Risk factors of acute heaptitis B in Karachi. MSc Thesis Programme in Epidemiology and Biostatistics. The Aga Khan University Karachi, 2001.
32.Ban A, Akhtar S. Rahbar MH, et al. Risk factors of hepatitis C virus infectioti in male adults in Rawalpundi -tslamabad, Pakistan. Trop Med Int Health 2001:6:732-8.
33.Simonsen L, Kane A, Llyod j. et al. Unsafe injection in developing world and transmission of blood born pathogen: a review. Bull World Health Organ I 999;77:789-800.
34.Birungi H, Asiimwe D, Whyte SR. Injection use and practices in Uganda. 1994 Action Programme on Essential Drugs. World Health Organization. WHO/DAP/94.18 8
35.Raglow G Luby SR Nabi N. Therapeutic injections in Pakistan: from patients' perspective Trop Med lnt Health 200 1;6:69-75.
36.Anand K. Panadav CS, Kapoor SK. Injection use in a village in North India. Nail Mcdi India 2001:14:143-4
37.Wyatt HV. Injections cripple injection skill. J Ind Med Assoc1986; 84:193-4,
38. Greenhalgh T. Drug prescription and self-medication in India. an exploratory survey. Soc Sci Med 1987; 25: 307-1 8.
39.Staa A, Hardon A. Injection practices in developing world: a comparative review of field studies in Uganda and Indonesia. 1996 Action Programme on Essential Drugs, World Health Organization. WHO/DAP/96.4.
40.Liss GM, Crimi C. Jaczek KH, et al. Improper office disposal of needles and other sharps: an occupational hazard outside of health care institutions Can J Public Health 1990; 81:4l7-20.
41.Johannessen LM, Dijkman M. Bartone C. et al Health care waste management guidance notes. Urban Development Division. Infrastructure Group, Environment Department and Health Nutrition and Population Team The World Bank, 2000.