

Research Article

A study to assess injection practices at different levels of health care facilities in district Gwalior, M.P., India

Leena Bhargo¹, Ranjana Tiwari^{1*}, Swapnil Jain¹, Praveen Yuwane¹,
Maan Bahador Rajpoot¹, Sakshi Tiwari²

¹Department of Community Medicine/PSM, G.R. Medical College Gwalior, M.P., India

²M.B.B.S. Student, GMC, Bhopal, M.P., India

Received: 28 May 2014

Accepted: 10 June 2014

*Correspondence:

Dr. Ranjana Tiwari,

E-mail: drranjana.tiwari50@gmail.com

© 2014 Bhargo L et al. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Injections are among the most commonly used medical procedure with an estimated 16 billion administrations each year worldwide. An overwhelming majority (90%-95%) of these injections are administered for curative purposes. Immunization accounts for around 3% of all injections. According to IPEN study, 03-06 billion injections administered annually in India. Estimates suggest that at least 50% of the world's injections administered each year are unsafe, particularly in developing countries. Most of the curative injections are unnecessary, ineffective or inappropriate. Purpose of current study was to assess and compare the knowledge, skill and practices at different levels of health care by health care providers regarding 'Safe injection practices'.

Methods: The present study has been undertaken in the outdoor departments of government health care facilities of district Gwalior. The study was done at three places namely: Civil dispensaries, district hospital & medical college hospital - Madhav dispensary (Tertiary care hospital) from 1/7/12 - 28/2/13.

Results: Only 10 (33.4%) of the providers were aware regarding blood borne injection borne by faulty injection practices, the same number knew about the reasons for wearing the gloves for both patient and personal safety. All the providers had 100% knowledge regarding safe injection practices but in practical many of the skills were lacking at all the health care facilities.

Conclusion: There was a great disparity between knowledge and practice of health care provider regarding injection practices. They were quite aware about the transmission of diseases to them by the faulty injection practices but more efforts are needed to be done in this regard for the improvement for the use of safe injection practices in all the health care facilities.

Keywords: Infections, Health care facilities. Health care providers, Injection practices

INTRODUCTION

Injection is an important health care procedure used worldwide for administration of drugs. Billions of injections are used worldwide for curative care and for immunization.¹ Majority of the injections are unnecessary^{2,3} and are not used safely. Reuse of injection equipment in the absence of sterilization is common.^{4,5}

In the early twentieth century, safe injection initiatives began in developed countries when it was proved that non-sterile injections transmitted a pathogen that caused jaundice. The safe injection initiatives have been very effective in developed countries but have not received the required attention in developing countries.⁶ Unsafe injection practices which can transmit hepatitis B, hepatitis C, Human Immunodeficiency Virus (HIV) and

other blood borne pathogens have resulted in substantial burden of preventable Blood Borne Viral Diseases (BBVDs).^{6,7} The transmitted BBVDs remain silent for many years so the threat can be overlooked.⁸

To ensure the safe and appropriate use of injection worldwide, in 1999, WHO established an international alliance, the “Safe Injection Global Network” (SIGN).⁹

Injection is regarded as a powerful tool to heal disease,³ especially in developing countries. Patients are pleased and may feel that they have obtained the best care when they are administered injections. Health workers get financial and status rewards by using injections. Hence a mutually reinforcing cycle exists between the patient and the injection provider which is responsible for frequent use of injections.⁶

According to WHO “a safe injection does no harm to the recipient, does not expose the healthcare worker to any risk, and does not result in waste that puts the community at risk”.¹⁰

METHODS

The present study has been undertaken in the outdoor departments of government health care facilities of district Gwalior. The study was done at three places namely: civil dispensaries, district hospital & medical college hospital - Madhav dispensary (Tertiary care hospital) from 1/7/12 - 28/2/13.

A predesigned & pre structured questionnaire based was used to collect the present information regarding knowledge, skill and practices about safe injection practices and waste disposal management. General profile of injection providers working in injection room and immunization room of civil dispensaries, district hospital & medical college hospital was taken.

Knowledge of washing of hands before giving the injection, wearing of gloves, & its reason checking the expiry date on the ampoule or vial, knowledge regarding cleaning the site before giving the injection, using syringe from the unopened pack, destroying syringe immediately by hub cutter and use of colour coded boxes for immediate disposal of waste knowledge about the blood borne viral diseases was also enquired.

The procedure of injection practices was observed with the ‘no interference’ phenomenon. A list of civil dispensaries of Gwalior was taken from the C.M.H.O. Gwalior & by random sampling method a total of 5 civil dispensaries were selected. In all the civil dispensaries the injection room and the immunization room was operating in the same room. So the providers working were common in the study.

In district hospital in injection room there were 6 providers (who work in a shift duty of 24 hours 2 for each

8 hours) and 2 from immunization clinic so a total of 8 injection providers were interviewed. In medical college there where 1 provider in injection room and 2 providers were from immunization clinic, so a total of 3 injection providers were interviewed. The study was approved by the ethical committee of the college. The data was collected, analyzed and interpreted. The % & Chi square test was done for statistical analysis.

Informed consent

Informed verbal consent was obtained from the subjects after explaining the purpose, nature and procedure of the study. They were assured that their confidentiality would be strictly maintained.

Inclusion criteria

Out-patient departments of government health care facilities located in Gwalior district and health personnel were willing to participate in the study.

Exclusion criteria

Indoor patients of civil dispensaries, district hospital, department of anesthesia, psychiatry and neurology OPD. Antenatal cases coming for tetanus toxoid immunization coming at the immunization room at different health care facilities.

RESULTS

The present study shows the age of injection providers work experience, training, its duration and last training received as shown in Table 1 & Table 2. Table 3 shows the knowledge of providers regarding blood borne viral infections due to injectable practices in health care facilities and also reasons of wearing gloves.

All the injections providers had 100% knowledge of washing of hands before giving the injection, wearing gloves, checking expiry date on the ampoule or vial, knowledge regarding cleaning the site before giving injection, using syringe from unopened pack and advised to be given after the injection destroying syringe immediately by hub cutter, not to recap the needle and use of colour coded boxes for disposing the waste immediately after the procedure.

Table 4 shows the different skills of health care providers at different health care facilities. Figure 1 shows the different skill used for the immediate disposal of waste generated after injection practices. These skills should not be used for ‘Safe injection practices’.

Table 5 shows the knowledge regarding depiction of waste disposal written guidelines, availability of colour coded boxes and final disposal of the injection waste.

Table 1: Showing distribution of age of injection providers working at different health care facilities.

Age in years	Civil dispensaries (n=19)		District hospital (n=8)		Medical college hospital (n=3)		Total (n=30)	
	No.	%	No.	%	No.	%	No.	%
20-25	01	5.3	00	0.0	00	0.0	1	3.3
25-30	02	10.5	01	12.5	00	0.0	3	10.0
30-35	02	10.5	02	25.0	00	0.0	4	13.3
35-40	01	5.3	01	12.5	00	0.0	2	6.7
40-45	03	15.7	01	12.5	00	0.0	4	13.3
45-50	02	10.5	02	25.0	01	33.3	5	16.7
>50	08	42.2	01	12.5	02	66.7	11	36.7
Total	19	100.0	08	100.0	03	100.0	30	100.0

Table 2: Showing work experience, training & its duration of injection providers working at different health care facilities.

	Civil dispensaries		District hospital		Medical college hospital		Total	
	No.	%	No.	%	No.	%	No.	%
Work experience (years)								
<1	0	0	2	25	0	0	2	6.6
1-5	3	15.8	3	37.5	0	0	6	20.0
5-10	7	36.8	2	25	1	33.4	10	33.4
>10	9	47.4	1	12.5	2	66.6	12	40.0
Injection practices training								
Yes	0	0	2	25	3	100	5	16.7
No	19	100	6	75	0	0	25	83.3
Duration of training process								
1-3 days	0	00	2	100	3	100	5	100

Table 3: Showing the knowledge of providers regarding blood borne viral infections due to injectable practice & reason of wearing of gloves at different health care facilities.

	Civil dispensaries (n=19)		District hospital (n=8)		Medical college hospital (n=3)		Total (n=30)	
	Yes No. (%)	No No. (%)	Yes No. (%)	No No. (%)	Yes No. (%)	No No. (%)	Yes No. (%)	No No. (%)
Knowledge regarding blood borne viral infections due to injectable practice								
Only HIV	06 (31.6)	00 (0.0)	01 (12.5)	00 (0.0)	00 (0.0)	00 (0.0)	07 (23.3)	00 (0.0)
HIV + Hep. B	10 (52.7)	00 (0.0)	03 (37.5)	00 (0.0)	00 (0.0)	00 (0.0)	13 (43.3)	00 (0.0)
HIV + Hep. B + Hep. C	03 (15.7)	00 (0.0)	04 (50.0)	00 (0.0)	03 (100.0)	00 (0.0)	10 (33.4)	00 (0.0)
Knowledge of reasons for wearing the gloves								
For personal safety against needle stick injury	09	47.4	04	50	00	0.00	13	43.3
For patient safety	06	31.5	01	12.5	00	0.00	07	23.3
For both personal & patient safety	04	21.1	03	37.5	03	100.0	10	33.4

Table 4: Showing the different skills used regarding use of safety measures for giving injections at different health care facilities by the injection providers working at immunization room and injection room.

Skills used for injection practices	Civil dispensaries (n=19)		District hospital (n=8)		Medical college hospital (n=3)		Total (n=30)	
	Yes No. (%)	No No. (%)	Yes No. (%)	No No. (%)	Yes No. (%)	No No. (%)	Yes No. (%)	No No. (%)
Washing of hand before giving the injection	0(0.0)	19 (100.0%)	05 (62.5)	03 (100.0)	03 (37.5)	00 (0.00)	08 (26.6)	22 (73.4)
Wore gloves during procedure	00 (0.00)	19 (100.0%)	02 (25.0)	06 (75.0)	02 (66.7)	01 (33.3)	04 (13.3)	26 (86.7)
Checked expiry date before giving the injection	19 (100.0)	00 (0.00)	08 (100.0)	00 (0.00)	03 (100.0%)	00 (0.00)	30 (100.00)	00 (0.00)
Used cutter to open the ampoule	04 (21.1)	15 (78.9)	03 (37.5)	05 (62.5)	02 (66.7%)	01 (33.3)	09 (30.0)	21 (70.0)
Used syringe from unopened packet	19 (100.0)	00 (0.00)	08 (100.0)	00 (0.00)	03 (100.0%)	00 (0.00)	30 (100.0)	00 (0.00)
Cleaned the site before giving the injection	19 (100.0)	00 (0.00)	08 (100.0)	00 (0.00)	03 (100.0%)	00 (0.00)	30 (100.0)	00 (0.00)

Table 5: Showing the details regarding injection waste disposal.

	Civil dispensaries		District hospital		Medical college hospital		Total	
	No.	%	No.	%	No.	%	No.	%
Depiction of written guidelines								
Present	3	60	2	100	2	100	7	77.78
Absent	2	40	00	0	00	0	2	22.22
Total	5	100	100	100	100	100	9	100
Availability of colour coded boxes								
Present	1	20	2	100	2	100	5	55.6
Absent	4	80	0	0	0	0	4	44.4
Total	5	100	2	100	100	100	9	100
Terminal disposal of injection waste								
Carried away by municipality	5	100	0	0	0	0	5	71.43
Sent to the incinerator	0	0	1	100	1	100	1	28.57
Total	5	100	1	100	1	100	7	

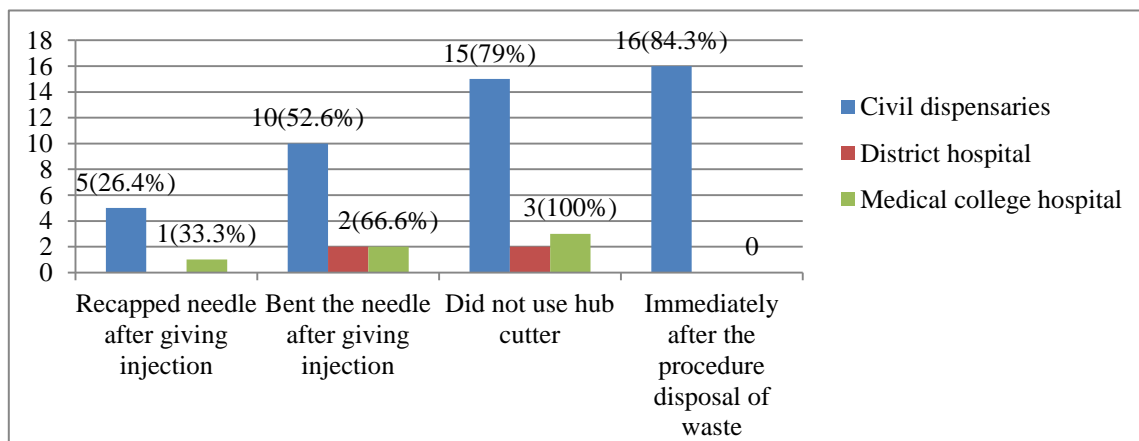


Figure 1: Showing the different skill done at different health care facilities by health care providers regarding waste disposal after injectable practice.

DISCUSSION

In the present study the maximum number of the providers were of the age group more than 50 years i.e. (36.7%), followed by 45-50, years 5 (16.7%), A. A. Mahafouz et al.¹¹ stated that in this study the mean age was of the females was 32.35 (8.86%).

In this study all the providers i.e. 30 (100.0%) were females; it was dissimilar from the study of A. A. Mahafouz et al.¹¹ study in which 35.5% were females.

In this study the maximum number 5 (16.7%) of providers took training regarding safe injection practices while in the study of M.C. Chill et al.¹² who stated that 58.33% providers were trained in injection safety training. In this study this was quite low. Only 25 (83.3%) of the providers does not took any training regarding safe injection practices while in the study of Choudhary Azad AK et al.¹³ who stated that 73% of the providers were not trained. All the providers of civil dispensaries were not trained in injection safety training. While in district hospital, & in medical college hospital, 2 & all were trained respectively.

In this study the providers of different health care facilities have knowledge of HIV 7 (23.3%), 13 (43.3%) of HIV and HBV and 10 (33.3%) of HIV, HBV and HCV. In the study of Salah R et al.¹⁴ who expressed that 78.3% had knowledge of HBV, 62.9% of HCV and 69.2% if HIV. The knowledge of blood borne viral diseases was quite low in comparison to the other studies.¹⁴

In this study all the providers of different health care facilities i.e. civil dispensaries, district hospital and medical college hospitals 30 (100%) had the knowledge regarding utilization of different injection practices during injection practices.

In the study of Ashish Naik et al. which stated that 100.0% providers had the knowledge of wearing the gloves¹⁵ which was similar to this study i.e. 30 (100.0 %).

S. Sharma et al.¹⁴ stated that 34.2% providers had the knowledge who do not recapped the needle after injection procedure. In another study Ashish Naik et al.¹⁵ stated that 65% providers had the knowledge not to recapped the needle while in this study 100% had the knowledge who did not recapped the needle which was a very positive aspect in this study.

The reason for wearing the gloves for personal safety against infection was 13 (43.3%), 7 (23.3%) wore for patient safety while 10 (33.4%) wore for both personal and patient safety (P value = 0.091). In the study of Ashish Naik et al. (2012)¹⁵ 60% wore gloves for personal safety against infection, 25% for patients safety and 15% for both personal and patient safety. In the present study,

the knowledge of wearing gloves was quite high from the other studies.¹⁵ In this study all the providers of different health care facilities i.e. 30 (100%) had the knowledge regarding disposal of injection related risk but On observation of the skills regarding safe injection practices on the providers at different health care facilities, 8 (26.6%) health care providers washed their hands before giving the injection.

Olademej Akeem et al.¹⁶ stated that 20% providers washed their hands before and after giving the injection, Vincent E. Omorogbe stated 78.7% of the providers washed their hands before and after giving the injection. It was quite high from Olademej Akeem et al.¹⁶ study while quite low in comparison to Vincent E. Omorogbe¹⁷ study. In this study 4 (13.3%) providers wore gloves during the injection procedure in Ashish Naik et al.¹⁵ study 35.0% wore gloves during injection procedure which was quite high in comparison to this study. In this study 26 (86.7%) did not wore gloves during injection procedure.

Varun Aggarwal et al.¹⁸ stated that 40.0% providers does not wore gloves during the procedure. Rehan HS et al.¹⁹ stated that 61.6 % of the providers does not wore gloves. In another study done by Muralidhar et al.²⁰ who also stated that 44.7% does not wore gloves during the injection practices. In this study, all 30 (100%) health care providers checked the expiry date before giving injection and used the syringe from unopened packet.

Choudhary Azad AK et al.¹³ stated that 84.5% providers used new syringe for giving the injection. In another study A. A. Mahfouz et al. and M. C. Chill et al.^{11,12} who stated that 100.0% providers used new syringe for giving the injection. Similar to this, in the present study 100.0% providers used new syringe for giving the injection. In this study 9 (30%) providers used cutter to open the ampoule whereas 21 (70%) used solid object. Rehan HS et al.¹⁹ also stated that 44.4% providers opened the Ampoule with the solid object, which was quite high in comparison to this study.

Ashish Naik et al.,¹⁵ Rehan HS et al.,¹⁹ Vincent E. Omorogbe,¹⁷ Muralidhar et al.,²⁰ Olademej et al.¹⁶ all stated that 50%, 12.2%, 23.0%, 66.3%, 86.7% respectively providers recapped the needle after giving injection while only 6 (20%) providers in this study recapped the needle after giving injection. A. A. Mahfouz et al.¹¹ stated that 11.3% providers were bending the needle before disposal while in this study this was quite high i.e. 14 (46.6%) providers bended the needle before the disposal which is a negative part of the injection practices.

In this study, inspite of having good knowledge 10 (33.3%) providers used cutter while 20 (66.7%) did not utilize the facility of cutter. 14 (46.6%) of providers

disposed sharp waste immediately in colour coded boxes (for waste disposal).

Olademej et al.¹⁶ stated that 95.2% providers used safety box (Colour coded boxes) for immediately disposing the needle. In this study 16 (53.4%) did not disposed sharp waste immediately in colour coded boxes. Choudhary Azad AK et al.¹³ stated that 81.5% disposed used syringes and needle immediately in colour coded boxes.

ACKNOWLEDGEMENTS

The authors acknowledge the participants for their participation for the successful completion of the study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

- World Health Organization. Safety of injections question and answers. In: WHO, eds. Secretariat of the Safe Injection Global Network. Publication No. WHO/EHT/04.06. Geneva: World Health Organization (WHO); 2006: 1-3.
- Hutin YJ, Hauri AM, Armstrong GL. Use of injections in health care settings worldwide, 2000: literature review and regional estimates. *Br Med J*. 2003;327:1075-8.
- Drucker E, Alcabes PG, Marx PA. The injection century: Massive unsterile injections and the emergence of human pathogens. *Lancet*. 2001;358:1989-92.
- Kermode M, Holmes W, Langkham B, Thomas MS, Gifford S. Safer injections, fewer infections: Injection safety in rural north India. *Trop Med Int Health*. 2005;10:423-32.
- Bhattarai MD, Wittet S. Perception about injections and private sector injection practices in central Nepal. General Welfare Pratisthan and Gates Children's vaccine Programme at PATH, 2000. Available at: <http://www.path.org/vaccineresources/files/Nepal-Inject-Practices-RA.pdf>.
- Simonsen L, Kane A, Lloyd J, Zaffran M, Kane M. Unsafe injections in the developing world and transmission of blood-borne pathogens: a review. *Bull WHO*. 1999;77:789-800.
- Mantel C, Khamassi S, Baradel K, Nasri H, Mohsni E, Duclos P. Improved safety after targeted interventions in the Syrian Arab republic. *Trop Med Int Health*. 2007;12:422-30.
- Miller MA, Pisani E. The cost of unsafe injection. *Bull WHO*. 1999;77:808-11.
- World Health Organization (Home page). Programmes and projects: the sign alliance, 2000

Available at: http://who.int/injection_safety/sign/en.html.

- World Health Organization. Safe Injection Global Network (SIGN) initial meeting report, October 4-5, 1999. In: WHO, eds. WHO Report. Geneva, Switzerland: WHO; 2000: 1-64.
- Mahfouz AA, Abdelmoneim I, Khan MY, Daffalla AA, Diab MM, Shaban H, et al. Injection safety at primary health care level in south-western Saudi Arabia. *Eastern Mediterr Health J*. 2009;15(2):443.
- Shill MC, Fahad MB, Sarker Sarmistha, Dev Shrabanti, Rufaka HK, K. D. Ashish. Injection practices at primary healthcare units in bangladesh: experience at six Upazilla health complexes. *Aus Med J*. 2011;4(1):26-42.
- Chowdhary AK, Roy T, Faroque AB, Bachar SC, Asaduzzaman M, Nasrin N, et al. A comprehensive situation assessment of injection practices in primary health care hospitals in Bangladesh. *BMC Public Health*. 2011;11:779.
- Sharma S, Gupta A, Arora A. Knowledge, attitude and practices on needle-stick and sharps injuries in tertiary care cardiac hospital: a survey. *Indian J Med Sci*. 2010;64(9):396-401.
- Naik Ashish, Gharat Vaibhav, Bansal RK. An assessment of injection practices in urban health centres of Surat city: are the health care workers safe? *NJCM*. 2012 Jan-Mar;3(1):125-8.
- Oladimeji Akeem Bolarinwa, Adekunle Ganiyu Salaudeen, Sunday Adedeji Aderibigbe, Omotoso Ibraheem Musa, Tanimola Makanjuola Akande, James Olusegun Bamidele. Injection safety practices among primary health care workers in Ilorin, Kwara state of Nigeria. *Health Sci J*. 2012 Jul-Sept;6(3):496-508.
- Omorogbe Vincent E, Omuemu Vivian O, Isara Alphonsus R. Injection safety practices among nursing staff of mission hospitals in Benin city, Nigeria. *Ann Afr Med*. 2012 Jan-Mar;11(1):36-41.
- Varun Aggarwal, Anju Seth, Jagdish Chandra, Rohini Gupta, Praveen Kumar, Ashok Kumar Dutta. Occupational exposure to human immunodeficiency virus in health care providers: a retrospective analysis. *Indian J Comm Med*. 2012;37(1):45-9.
- Rehan HS, Chopra D, Sah RK, Chawla T, Agarwal A, Sharma GK. Injection practices of healthcare professionals in a tertiary care hospital. *J Infect Public Health*. 2012 Apr;5(2):177-81.
- Muralidhar S, Singh PK, Jain RK, Malhotra M, Bala M. Needle stick injuries among health care workers in a tertiary care hospital of India. *Indian J Med Res*. 2010;131:405-10.

DOI: 10.5455/2320-6012.ijrms20140860

Cite this article as: Bhargo L, Tiwari R, Jain S, Yuwane P, Rajpoot MB, Tiwari S. A study to assess injection practices at different levels of health care facilities in district Gwalior, M.P., India. *Int J Res Med Sci* 2014;2:1020-5.