IJRAR.ORG E-ISSN: 2348-1269, P-ISSN: 2349-5138

INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS (IJRAR) | IJRAR.ORG

An International Open Access, Peer-reviewed, Refereed Journal

A STUDY TO ASSESS INJECTION PRACTICES AT DIFFERENT LEVELS OF HEALTH CARE FACILITIES IN SURAT, GUJARAT, INDIA.

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ABSTRACT:

Background: Unsafe injection practices put patients and providers at risk of infectious and noninfectious adverse events. Most common medical procedure used in the health care facilities is Injections administration. As per the WHO, an estimated 16 billion injections are administered each year worldwide. An overwhelming majority (90%-95%) of these injections are administered for curative purposes including minor illness. Immunization accounts for around 3% of all injections. As per the data of 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 the safe injection practices of different health care facilities of Surat city. **Objectives:** To evaluate whether health care facilities meet the requirements for practices, equipment, supplies, materials and waste disposal for safe injection practice. **Methods and materials**: I have conducted a cross-sectional survey between the periods of May 2021 to December 2021 using the Revised Injection Safety Assessment Tool-C (WHO-2008) to evaluate injection safety practices of different health facilities of Surat city. Using simple random sampling by lottery method, 1 government, 14 urban health centre, 3 trust and 8 private health facilities were selected and evaluated. The research design used in this study was cross sectional survey. Total 26 health care facilities were observed and health care worker were interviewed to evaluate whether the health facilities meet the demand of requirement and supply to provide safe injection practices. The tool consists of observational checklist. Data analysis was planned on the basis of objectives of the study using descriptive and inferential statistics. The present study has been undertaken in the outdoor and indoor departments of government, trusts, private hospitals and urban health centre of different zones of Surat city. **Results:** There was neither short fall of injection equipment, material and supplies nor evidence of attempts to sterilize disposable devices. Care providers immediately disposed of the used needle/syringe in sharps containers. Injections were taken from sealed packets in all government as well as private health care facilities. In private and government facilities, 100 % of the health care providers were fully immunized against hepatitis B. Wearing a new pair of gloves for injection was observed in only 65% of government

and 55% of private health facilities. Many health facilities had an alcohol-based hand rub in injection area during visit but lacks in stock. 100% of the health care providers did not have any special training about safe injection practice within the previous last two years in government as well as private health care facilities. There was no any written policy or SOP for injection safety available in government as well as private facilities. No any incidence of recapping was observed. There was no any single incidence of needle stick injury reported within 12 months from government as well private facilities, **Conclusion**: Many injection safety aspects were maintained satisfactory in government as well as private health care facilities of Surat city. However there are still good time for improvement. Measures are required to supply alcohol-based hand rub, enough supply and appropriate sharps containers available for government and private facilities. In service educational training to health care workers in all facilities regarding safety measures must be periodically regularly organized to improve safe injection skills to reduce burden of unsafe practices.

Keywords: Infections, Health care facilities. Health care providers, Injection practices, Blood-borne viruses, injection safety, Injection assessments tool, Surat city.

Original Research:

Introduction:

Injections are consider as the most common health care procedure in health care sectors; Approximately, 16 billion injections are administered annually (1), with several billion injections given annually in developing countries (1,2,3). As per the report of The World Health Organization (WHO), approximate, 2 million needle-stick injuries occur every year to health care workers all over the world; these faulty technique can result in spread of hepatitis B and C and HIV infection (4,5). So, it is inevitable to address the safety measures of injection practices and risk factors associated with it and making prophylactic care available are the best actions against accidental transmission of blood born threats. Injections are considered as safe as per WHO when they pose no threat to the recipient, the provider or the community (6). To limit this threat, it is require to use of sterile needles, clean preparation surfaces, and immediate and proper disposal of used devices as well as an effective and safe method of final disposal to prevent infectious and noninfectious adverse events. The adequacy and appropriateness of injection equipment, the use of sharps containers, the level of staffing, and the incidence of recapping, the awareness of risk, and the effectiveness and availability of training also affect risk of transmission of infections (6,7). Significant efforts have been made by the international community, under the leadership of the Safe Injection Global Network (SIGN), to limit the risk of unsafe injections all over the world (8). Real progress was made in reducing the number of unsafe injections in under privileged and developing countries from 2000 to 2010 (from 1.35 to 0.16 per person per year). However, the number remained high in the countries of the WHO Eastern Mediterranean Region, with 0.57 unsafe injections per person per year. In sub-Saharan Africa and Latin America, the average figure for 2010 was only 0.04–0.05 unsafe injections per person per year (9). In 2001, the Ministry of Health in Oman conducted a national survey of injection practices in 78 government health facilities across the country. The result of the study revealed that overall standards maintained by health care facilities were good; however, there were some lacking in some areas. Examples of areas identified by the 2001 study and requiring further strengthening, including increasing awareness regarding the Ministry of Health injection safety policy, streamlining request procedures for injection supplies and safe final disposal of sharps (10).

Methods and Materials:

In this study, cross-sectional survey design was used. Facilities were randomly selected through cluster and simple random sampling design (11). I used Revised Injection Safety Assessment Tool-C (WHO-2008) for the assessment of injection safety (12). The study was implemented in May-2021 over 2 phases: The first phase was the preparation and piloting, and the second was conducting the study, entry and analysis of data and reporting. At the time of the survey, Surat city was divided through 8 zones. I assessed injection safety in 2 representative samples, one in the public health sector in which government and Surat municipal hospitals were selected and the second in the private health sector in which private and trust hospitals were selected. In the public health sector, a representative sample was selected from the 1 governmental hospital and the 14 urban health centers. Data were collected using the questionnaire of the revised WHO Tool- C for the assessment of unsafe practices (12); this used a combination of interviews and structured observations to evaluate whether facilities meet the requirements for safe practices, equipment, supplies and waste disposal, and to identify unsafe practices. The assessment includes a checklist, and responses from health care providers are mostly categorical options in order to both standardize the assessment and simplify data management and analysis. Data were collected using a combination of structured observation and interviews. I conducted the survey and recorded the observations of the facility, worksites, supplies and practices according to a core set of checklist items. Observation included facility infrastructure and the following practices: injection, hand hygiene supply, material stocks, waste collection, sterilization, vaccination status and waste disposal management by health care facialities. Data entry and management were done using SPSS version-19.0. Data analysis was done separately for the public and private health sectors. Ethical considerationshas been taken from government medical college, Surat and Informed consent was obtained from the health care workers in the selected facilities.

Results:

Assessment of risks to patients:

There were total 26 health facilities surveyed and observed for safe injection practices in Surat city. Among them, 15(57.69%) were in the public health sector and 11(42.31%) in the private sector (Table 1) were selected and interview of health care providers were taken. Details of the safety assessment observation for patients and providers are given in Table 2. There was no evidence of attempts to sterilize disposable injection devices and all facilities were equipped with running water and cleansing soap. In most of the facilities we surveyed no needles were left in the diaphragm of multidose vials. Alcohol-based hand rub was available in 100% of governmental and 100% of private facilities (Table 2). No sterilizable (reusable) needles or syringes were used in either public or private facilities for injections. Syringes and needles were taken from a sterile packet in 100% of public facilities and 100% of private facilities for injection. For injections that require reconstitution, all syringes and needles were taken from a sealed packet in both public and private facilities. In private and government facilities, 100 % of the health care providers were fully immunized against hepatitis B. Wearing a new pair of gloves for injection was observed in only 65% of government and 55% of private health facilities. Many health facilities had an alcohol-based hand rub in injection area during visit but lacks in stock. 100% of the health care providers did not have any special training about safe injection practice within the previous two years in government as well as private health care facilities. There was no any written policy or SOP for injection safety available in government as well as private facilities. No any incidence of recapping was observed. There was no any single incidence of needle stick injury reported within 12 months from government as well private facilities.

Interview with provider:

The providers interviewed had not experienced needle-stick injury in the previous 12 months in 100% of facilities in both the public and private sector (Table-3). Around 100% of interviewed providers in governmental and private facilities have been fully immunized by hepatitis B vaccine. 100% of the health care providers did not have any special training about safe injection practice within the previous two years in government as well as private health care facilities.

Assessment of risk to care providers:

There was 1 puncture-resistant, leak-proof sharps container available in all rooms where injection procedure were performed in the governmental and private facilities. Open containers for sharps disposal were still seen in both public (100%) and private (100%) health facilities. After injection, all care providers immediately disposed of used needles/syringes in an appropriate sharps container. Recapping of syringes in injection rooms was not observed in (100%) public and (100%) private facilities (Table-2). Wearing a new pair of gloves for injection was observed in only 65% of government and 55% of private health facilities. Proportion of facilities surveyed in which the provider disposed sharps in appropriate sharps container, immediately after the procedure, is 100% for public and private facilities respectively. Appropriate disposal of non-sharps infectious waste was observed in 100% of public and private facilities (Table-2).

Risk to the community:

Sharps containers awaiting final disposal were completely closed in only 65% of private facilities and in 80% of facilities in public sector. Sharps containers awaiting final disposal were stored in an unlocked area in 100% of private and the public sector.

Discussion:

The main findings of the study indicate that there was no shortage of injection equipment, materials and supplies in government as well as private health care facilities in Surat city. There was no any evidence of attempts to sterilize the single-use injection equipment was observed in both government as well as private health care facilities. We also found that all syringes and needles were taken from a sealed packet in all health facilities. Additionally, the used needle/syringe was immediately disposed of in the appropriate sharps containers. All the facilities were equipped with running water and cleansing soap, alcohol-based hand rub was available in all observed facilities during the visit but enough stock was not available. It is important to note that in more than 100% of private and public health facilities didn't have 'injection safety', written policy or guidelines. This study was the first formal assessment at the surat city level to evaluate the safety of injections. The same study conducted in Oman in 2001 concluded that the overall standards were good; however, there were some clusters of concern where safe practices need to be strengthened. This survey was conducted using the old version of Tool C, which concerns only immunization and therapeutic injection in primary health care (13,14). The particular difference between this study and the previous assessment conducted in 2001 is the inclusion of both government and private health facilities. The 2001 study assessed facilitates providing primary care services only (10). In the 2001 study in Oman, recapped needles were observed in sharp-containers in 28% of the facilities where as in this present study there was no any recapping incidence observed.(10). In Nigeria there was a high unsafe injection practice among Primary Health Care workers in Ilorin metropolis, with 86.7% of health facilities using needle recapping after administration of injection whereas in present study situation was best. (15), while in Swaziland the situation was worse; changing needles in the same syringe and recapping of needles after use were observed in 31% of health facilities but data from the present study had zero reporting(16). In our study, the providers interviewed had not experienced needle-

stick injury in the previous 12 months in 100% of facilities in both the public and private sectors; this compares with the findings of the 2001 study where 17.9% of the providers had reported needle-stick injuries in the previous year (10).The main limitations in this study were related to its city level scope, thus there was no capacity to identify disparities between regions and health districts. Additionally, some gathered information, e.g. needle-stick injuries and hepatitis B immunization, were based on self-declaration through interviewed by the health care providers.

Conclusions:

Our findings indicate broad compliance with injection practices as defined by World Health Organization. Many injection-safety aspects were satisfactory: supplies were available, single-use syringes were used and practices were reasonable. However, action is required to make alcohol-based hand rubs and appropriate sharps containers available and provide hepatitis B vaccine and training for health care workers in both governmental and private facilities.

Acknowledgements:

The authors wish to thank all the participants of the study who actively participated and gave their precious time. Author also acknowledge the support from the Municipal commissioner, Surat, Medical superintend, New civil hospital, Surat. Dean, Govt. Medical College, Surat, Ethical committee, GMC, Surat. Author also expressed his gratitude to Dr. Niraj. B. Pandit. HOD, PSM Dept, Sumandeep Vidyadeep, Vadodara and all who were provide their valuable support directly or indirectly to complete this study. Author also would like to thanks to Medical officers, doctors, Matrons, staffs of UHC, private and Government hospital for support and guidance.

Ethical consideration:

The written ethical approval was taken from the authority of ethical committee, Government Medical college, Surat prior to conduct the study and also from the sumandeep ethical committee. Health care workers were voluntary participate. Verbal and written consent was taken from patients. Privacy, anonymity and confidentiality of the data obtain were assured.

Feasibility of the study:

There is no feasibility issue applicable for the study.

Benefits of the study:

Benefit of this study was in favour of the health care providers, patients and community.

Conflict of interest

There are no conflicts of interest.

Financial support & sponsorship

Nil

Table- 1: Type and Number of surveyed health care facilities.

(N =26)

Types of Facilities	No of sites
Public (Government) (n =15)	
Government hospital	1
Urban health Centre	14
Private (n =11)	
Private hospital	08
Trust hospital	03
Total health facilities	**26**

Table-2: Facility observations to assess safety to patients and providers in public and private health sectors, Surat city.

Indicator	Public Sector (N=15)			Private Sector (N=11)		
	Yes	No	%	Yes	No	%
Assessing risk to the patients						
Special room is available for injection procedure.	15	0	100	6	5	55
Hand washing facilities is available in injection area. Running water and soap for cleansing hands.	15	0	100	11	0	100
Alcohol based hand rub is available for cleaning hands in injection area.	15	0	100	11	0	100
Enough stock of sharp collection boxes is available in injection area.	15	0	100	11	0	100
Two handed recapping is observed.	15	0	100	11	0	100
Presence of sufficient sharp in the facility vicinity.	15	0	100	11	0	100
Presence of bins facilities as per biomedical protocol.	15	0	100	11	0	100
Currently available enough stock of new syringes and needles at facility.	15	0	100	11	0	100
No non-sharps infectious health care waste of any type outside of containers specific for non-sharps infectious waste	15	0	100	11	0	100
No multi-dose vials with needles left in the diaphragm	15	0	100	11	0	100
Assessing risk to providers						
No used sharps in an open container	15	0	100	11	0	100

in any area of the facility						
puncture-resistant and leak-proof sharps container in all areas	15	0	100	11	0	100
puncture-resistant safety container in stock	15	0	100	11	0	100
No any loose disposable injection equipment outside of the packaging anywhere inside the facilities	15	0	100	11	0	100
No Evidence of attempted sterilization of disposable injection equipment.	15	0	100	11	0	100

Table-3: Items reflecting risks to patients and/or providers based on the provider interview health sector, Surat city.

Indicator	Public Sector (N =15)			Private Sector(N=11)		
	Yes	No	%	Yes	No	%
No stock-outs of puncture-resistant sharps containers during the previous 6 months	15	0	100	11	0	100
Provider did not experience any needle-stick injury in the previous 12 months.	15	0	100	11	0	100
Provider had injection safety training available to them within the previous 2 years in a lecture or workshop	0	15	0	0	11	0
Provider had received ≥3 doses of hepatitis B vaccine	15	0	100	11	0	100
Written policy or SOP is available for safe injection practice.	0	15	0	0	11	0

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