



[Science Archives \(ISSN:2582-6697\)](http://www.sciencearchives.org)

journal homepage: www.sciencearchives.org



<http://dx.doi.org/10.47587/SA.2021.2407>



Original Research Article

Cross sectional study on sterilization in a tertiary cardiac Hospital of Bangladesh

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Received: Nov 30, 2021 / Revised: Dec 13, 2021/ Accepted: Dec 21, 2021

Abstract

At any time, 1.4 million people suffer from healthcare associated infections. Reports have been published about the risk of infection caused by improper practice of sterilization. So the main objective of this research was to know the awareness, attitude, and practice among the healthcare staffs regarding the sterilization practice of a tertiary cardiac hospital in Bangladesh. 51 healthcare staffs from cardiac OT, cath lab and infection control department were the respondents of this cross sectional descriptive study & data was collected by a questionnaire survey from April 05, 2021 to May 03, 2021. The significant findings of this research are: 23.5% of the staffs had needle injury while working throughout their career. Among them only 3.9% reported to their authority and took treatment for that while the rest overlooked the matter completely and did not take the necessary precaution steps. Another significant finding is 80.4% of the staffs have been vaccinated against Hepatitis B, still 19.60% haven't take vaccine. This type of study should be done regularly by the hospital authority to find out the lacking of the hospital.

Keywords CSSD, Sharp Injury, Infectious Disease, IPC

Introduction

In hospital settings, adequate procedures of sterilization is a must to carry out for patient's safety and it is considered as one of the major requisites preventing surgical site infection (Zaman et al., 2021). Several latest techniques or technology of sterilization have been innovated for reprocessing surgical instruments in hospital settings. "Central Sterile Supply Department", CSSD, is the department of a hospital who is responsible for and overlooks as well as provides sterilized material to all the other departments of the hospital. Receiving, washing or cleaning, packaging, sterilization and finally distribution of sterile equipment, surgical instruments and other materials etc are the activities of this department. So

for centralizing the total sterilization procedure of a hospital, CSSD service was established and this service is provided by trained healthcare professionals. CSSD service ensures more effective sterilization process, saves the time of nursing (Kulkarni and Chillarge, 2015). The main purpose of CSSD is to supply all the departments of a hospital with guaranteed sterile instruments, devices or other materials which are ready to use for surgery or other patient care. This service is very much important for preventing the infection.

In all over the world, people up to 1.4 million suffer from healthcare associated infections in any time. Many reports have been published about the risk of infection which is

caused because of improper practice of sterilization (Zaman et al., 2021).

After cardiac surgery, infection is considered as the most common non cardiac complication. So proper sterilization practice is very much necessary for any cardiac hospital like the other hospitals to minimize the risk of surgical site infection (Gelijns et al., 2014). To assess the awareness level, attitude, and practice among the healthcare staffs on sterilization procedure of a tertiary cardiac hospital in Bangladesh, this survey based study was administered.

Materials and Methods

Ethics

Approval was taken from the appropriate authority of the institution.

Study Design

This cross sectional descriptive and exploratory research was administered in a tertiary cardiac hospital in capital of Bangladesh (Dhaka city) from April 05, 2021 to May 03, 2021. Total 51 healthcare staffs from cardiac OT, cath lab and infection control department were the respondents of this study. Purposive sampling technique was employed to collect the samples from the hospital for this research to be carried out. A Questionnaire was administered among the respondents which was covered with few demographic information like working experience, age and details about awareness, attitude and practice on sterilization, disinfection, biomedical waste management, needle injury, vaccination status of the healthcare staffs etc (Table 1, 2 & 3). The questionnaires are given below:

Table 1. Awareness among healthcare professionals

No.	Awareness	Answer	Code
Q.1.1	Are you aware of different sterilization methods & its harmful effects?	Yes=1, No=2	
Q.1.2	Are you aware of different disinfection methods & its harmful effects?	Yes=1, No=2	
Q.1.3	Are you aware of post sterilization management of surgical instruments?	Yes=1, No=2	
Q.1.4	Are you aware of the temperature for sterilization in autoclave?	Yes=1, No=2	
Q.1.5	Are you aware that infectious disease can be transmitted when aseptic precautions are not taken?	Yes=1, No=2	
Q.1.6	Are you aware of the methods of biomedical waste management?	Yes=1, No=2	
Q.1.7	Are you aware of the sterilization protocol/policy in your hospital?	Yes=1, No=2	
Q.1.8	Are you aware of the Infection prevention & control policy in your hospital?	Yes=1, No=2	

Table 2. Attitudes of health care professionals

No	Attitude	Answer	Code
Q.2.1	Is there a need to regularly train health staff on sterilization and disinfection procedure?	Yes=1, No=2	
Q.2.2	Should health staff require vaccination before performing disinfection and sterilization procedure?	Yes=1, No=2	
Q.2.3	Should health staff always put on proper personal protective measures while disinfection & sterilization procedure?	Yes=1, No=2	
Q.2.4	Should health staff reuse disposable needles, intravenous sets?	Yes=1, No=2	
Q.2.5	Should health staff always wash hands with antiseptic before and after handling patients?	Yes=1, No=2	
Q.2.6	Should health staff always follow proper sterilization & disinfection guidelines or policy?	Yes=1, No=2	
Q.2.7	Is there a need to regularly train health staff on biomedical waste management methods?	Yes=1, No=2	

Table 3. Practice of health care professionals

No.	Practice	Answer	Code
Q.3.1	Do you wash hands with antiseptic before and after disinfection & sterilization procedure?	Yes=1, No=2	
Q.3.2	Do you use personal protective measures while disinfection & sterilization procedure?	Yes=1, No=2	
Q.3.3	Do you use disposable needles, intravenous sets etc?	Yes=1, No=2	
Q.3.4	Did you ever get needle injury?	Yes=1, No=2	
Q.3.5	Did you report and take treatment for needle injury?	Yes=1, No=2	
Q.3.6	Do you have any training on sterilization & disinfection procedure for surgical instruments?	Yes=1, No=2	
Q.3.7	Have you been vaccinated against Hepatitis B?	Yes=1, No=2	

Statistical Analysis

The spreadsheets data were imported into IBM SPSS 22 (SPSS inc., Chicago, IL, USA) to perform a descriptive exploratory study.

Results

Demographic profile of the health care staffs (n=51)

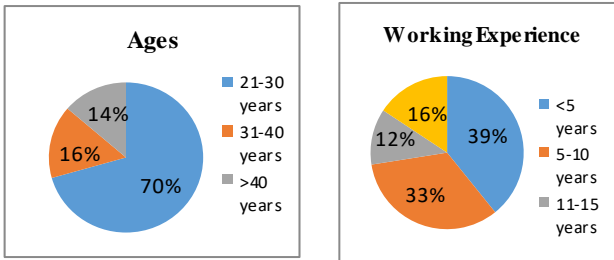


Fig. 1 Age distribution Fig. 2 Working Experience

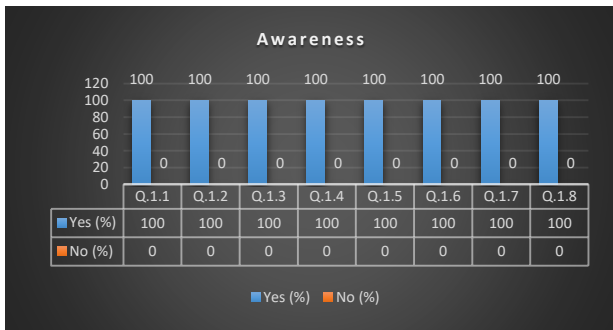


Fig. 3 Awareness among health-care professionals

All the results were satisfactory in this part. All the healthcare staffs were 100% aware of different sterilization and disinfection methods and their harmful effects, post sterilization management of surgical instruments, temperature for the sterilization in autoclave, aseptic precautions, biomedical waste management, sterilization and infection prevention and control policy of their hospital. Their awareness level on sterilization procedure can be compared to the staffs of any developed foreign hospital.

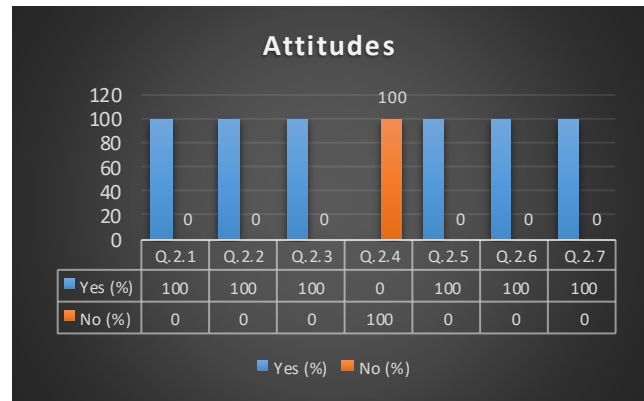


Fig. 4 Attitudes of health care professionals

They all had positive attitude in different aspects of infection prevention and control like training on sterilization, disinfection and biomedical waste management procedure, vaccination before sterilization and disinfection procedure, wearing personal protective equipment, washing hands before and after handling patients with antiseptic, proper sterilization & disinfection guidelines following. None of them were supportive to use disposable needles, intravenous sets. No dissatisfactory result had been found in this part. Their attitude level can also be compared to the staffs of any developed foreign hospital.

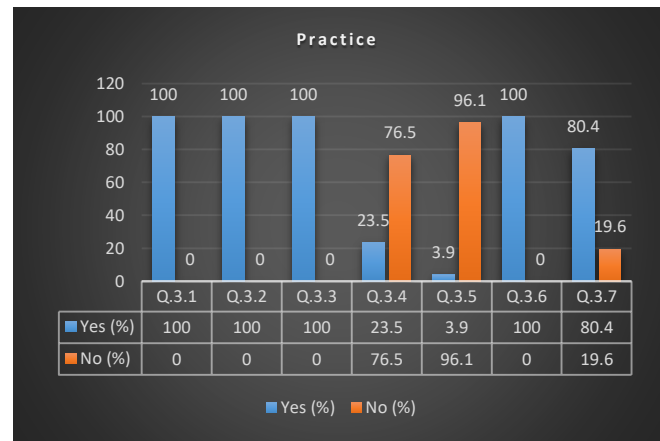


Fig. 5 Practice of health care professionals

There were few dissatisfactory results in this part. 23.5% healthcare staffs had needle injury, it can happen but the important thing was only 3.9% of them reported it to the authority and took treatment for it. Rest of the (96.1%) staffs remained silent in this regards which was very much threatening both for the healthcare staffs as well as for the patients.

Discussion

The most significant findings of this research was, 23.5% staffs had needle injury while working throughout their career, among them only 3.9% reported to the authority and took treatment for that which is already mentioned in the above result part. There are six devices which are mainly responsible for majority of the sharp and needle stick injuries identified by United States National Surveillance System (NaSH). The devices are suture needles, scalpel blades, winged steel needles (butterfly), hypodermic needles, phlebotomy needles and IV catheter stylets (CDC 2004). Needle stick or other sharp injuries can transmit dangerous blood borne pathogens to the healthcare providers, including hepatitis C virus, hepatitis B virus and HIV or human immunodeficiency virus (HIV). In United States, each year as a result of sharps injuries, more than 35 health care staffs contract with HIV, 400 contract with hepatitis B and 2,000 contract with hepatitis C (Shelton and Rosenthal, 2004). The frequency of needle stick injuries is the highest in developing countries. In Africa, the health care professionals suffer 2-4 needle stick injuries on average per year and over 50% of the hospitalized patients are HIV positive (Wilburn, 2004). So sharp injury is dangerous for both healthcare staffs as well as the patients. If all the needle or sharp injured healthcare professionals reported the information of their injury in time to their authority and took treatment, then the result of this study would be satisfactory (Zaman et al., 2021).

Another dissatisfactory findings of this study is, 80.4% of the total healthcare staffs were vaccinated against Hepatitis B, rest of the (19.6%) staffs were not. Risk of Hepatitis B Viral infection by a contaminated needle stick injury is 2 - 40%, according to CDC, 1998a (CDC 1998a). So the healthcare staffs must have to be vaccinated against Hepatitis B which is also recommended in the study of Sifat Uz Zaman M et al, 2021 (Zaman et al., 2021). But the practice among the healthcare staffs of washing hands with antiseptic, using personal protective measures, using disposable needles and intravenous sets, training on sterilization & disinfection procedure for surgical instruments were 100% satisfactory.

Conclusion

The healthcare staffs must have to be immunized by vaccine before performing duty which have to be ensured by IPC team of the hospital. Vaccination center need to be

established for healthcare staffs. The staffs must have to report to the infection prevention and control committee of the hospital if any needle injury is occurred while working. Continuous training program should have to be arranged for the healthcare staffs for raising awareness in this regard. This type of study should be done regularly by the hospital authority to find out the lacking of the hospital. Due to time constraints, the healthcare staffs of only one cardiac hospital was selected to conduct this research. To understand the overall situation of Bangladesh, large sample size need to be taken for further research.

Conflict of Interest

The authors announce that there is no conflict of interest with respect to the publication of this article.

Acknowledgement

M Kamal Uddin, Managing Director, Medlife Healthcare Limited for his assistance, tremendous support & inspiration throughout the research work.

References

- Centers for Disease Control (CDC, 2004). Workbook for designing, implementing, and evaluating a sharps injury prevention program. http://www.cdc.gov/sharpsafety/wk_info.html.
- Centers for Disease Control and Prevention. (1998a). Guidelines for infection control in health care personnel. *Infection Control and Hospital Epidemiology*, 19(6).
- Gelijns, A. C., Moskowitz, A. J., Acker, M. A., Argenziano, M., Geller, N. L., Puskas, J. D., ... & Cardiothoracic Surgical Trials Network (CTS). (2014). Management practices and major infections after cardiac surgery. *Journal of the American College of Cardiology*, 64(4), 372-381.
- Kulkarni, S., & Chillarge, C. (2015). Knowledge, attitude and practice regarding sterilization among staff in central sterile supply department of brims bidar: A Hospital Based Study. *practice*, 40, 60.
- Shelton, P. & Rosenthal, K. (2004). Sharps injury prevention: select a safer needle. *Nursing management*, 35(6), 25-31.
- Wilburn, S. Q. (2004). Needlestick and sharps injury prevention. *Online journal of issues in nursing*, 9(3), 5.
- Zaman, M. S. U., Ahmed, M., Mahboob, N., Iqbal, H., Afrin, S., & Biswas, S. M. (2021). Awareness, Attitude and Practice on Sterilization among Healthcare Staffs of a Tertiary Hospital in Bangladesh. *Eur. J. Med. Health Sci*, 3(1), 12-18.
- Zaman, S. U., Sadia, I., Yasmin, N., Islam, K. N., Rahman, M. M., Haq, A. & Adnan, N. (2021). Application of Rapid Biological Indicators Coupled With Auto-Reader for the Quality Assurance of Surgical Instruments After Sterilization at a Cardiac Hospital in Bangladesh. *Cureus*, 13(11).

How to cite this article

Zaman, S.U., Sadia, I., Haque, S. and Rahman, M. M. (2021). Cross Sectional Study on Sterilization in a Tertiary Cardiac Hospital of Bangladesh. *Science Archives*, Vol. 2 (4) 316-319. <http://dx.doi.org/10.47587/SA.2021.2407>

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