Original Article

Awareness of Sterilization at Dental Clinics in two Cities of Pakistan

Sterilization at Dental Clinics

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ABSTRACT

Objectives: To observer sterilization standard in dental clinic s of Hyderabad and Karachi.
Study Design: Comparative / Observational Study
Place and Duration of Study: This study was conducted at Hyderabad and Karachi from Feb 2016 to July 2016.
Materials and Methods: In this survey data on sterilization methods was collected from two big cities of Pakistan, (Karachi and Hyderabad), by questionnaire method. Three undergraduate students from Hyderabad and two undergraduate students from Karachi were assigned to personally collect data from practitioners to insure 100% reliability. Different variables of sterilization were compared between cities.
Results: Data shows autoclaving without disinfection as the favored method of sterilization; 86% in Karachi as compared to Hyderabad, which shows disinfection prior to autoclaving in 70.2% practitioners. Brushing was the preferred method for mechanical dislodgement of debris in both cities, Karachi 88% and Hyderabad 81%. 13.5% of practitioners of Hyderabad performed sterilization by themselves while in Karachi only 9.3% performed themselves.. Preferred autoclaving temperature for both cities was 121^{o}C, Karachi 53.48% and Hyderabad 62.16%. Maintaining sterilization by using pouch during autoclaving was found more extensively in Karachi 100% in contrast to Hyderabad 73%. Neglecting checking of sensitivity of autoclave was found to be in greater odds in Hyderabad 60% than Karachi 37.21%.
Conclusions: Steam autoclaving as primary method of sterilization. Importance of checking of autoclave sensitivity was over sighted in both cities but on different scale.
Key Words: Sterilization; Survey; Autoclave; Glutaraldehyde.

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INTRODUCTION

Infection control programs in dental clinics are essential to prevent of infectious transmission among personnel and patients[1]. An infectious microorganism may be transferred from the patient to members of the dental team, but also vice versa[2] . The risk of transmission from an antigen-positive dentist to his patients is probably much smaller, and there is no evidence to restrict his clinical activities[3] Microbes on dental instruments, from salivary contact can prolong their survival at room temperature[45], According to Pakistan Medical Research Council HBs Ag was positive in 2.5% and anti HCV in 4.9%. Hence, overall positivity for both HBs Ag and HCV is 7.4%. The data indicate that almost 12 million people are positive for these viruses. Dental environment is favorable for transmission of these diseases if proper sterilization is not conducted Analyzed also strong evidence of transmission of hepatitis B and hepatitis C necessitates maintaining strict sterilization protocol[68]. Steam autoclaving has been regarded as the most efficient method of sterilization in dental territory[910]

In order to prevent transmission of vulnerable microbes and their spores, effective means of sterilization is mandatory. Blood borne diseases like hepatitis B and hepatitis C are dominating in Pakistan, a weighted average of hepatitis B antigen prevalence among healthy adults (blood donors and non-donors) was 2.4% and for hepatitis C antibody was 3.0%(11); due to drug abuse and false surgical and dental practices[68].There is a strong evidence of relationship in therapeutic injections and prevalence of hepatitis C in Pakistan[12] which suggest use of unsterile injections to illiterate population. In 1999, the World Health Organization (WHO) established the Safe Injection Global Network (SIGN), which advocates a range of interventions for the promotion of injection safety, as well as exhorting

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healthcare workers to use a new needle and syringe for every injection[13]. High rates of health care workers are also infected with hepatitis B and C in Pakistan[14], which further jeopardizes the condition. Most of the patients are coming for simple root canal treatment or extraction of tooth and taking life risking diseases with them as a gift from their consultant. Mechanical dislodgement and sterilization can be distinguished on the basis of function[15]. The task of mechanical dislodgement is to remove all kinds of visible contamination from substrate, which helps in providing accessibility of microbial inactivation methods to substrate surfaces[16]

Adequate pre-sterilization cleaning is fundamental for sterilization success[17]. Inadequacies in pre sterilization cleaning of dental instruments render instruments to be contaminated and a viable source of cross infection[18]. Sterilization is complete destruction of all living microorganisms (fungi, viruses, bacteria) and their spores[19 20]. Moist heat, dry heat, ethylene oxide gas, hydrogen peroxide gas, plasma and liquid chemicals are the principal sterilizing agents used[21]. When chemicals are used for proper timings they are able to completely eliminate all microorganism and their spores and hence they are chemical sterilants[22]. These same germicides used for shorter exposure periods may also be part of the disinfection process[23]. Disinfection is complete destruction of all living microorganisms without their spores[19,20]. Prior cleaning and disinfection results in better precaution against prion contamination than without these prior protocols for heat sterilization[23]. Sterilization methods also reduce the life of instruments[24]

The purpose of this survey was to perform a comparative study to assess inter-city and intra-city variations and possible causes of inadequate sterilization as compared to international standardized sterilization guidelines.

MATERIALS AND METHODS

A rough list of professionals was collected from authors of previous surveys. Three students from LUMHS University Jamshoro, one student from Bahria University Karachi and one student from Dow international, were assigned for personally collecting information to insure 100% reliability. The purpose of study was explained to every practitioner; a written consent and testimony was taken at the end of questionnaire form. Variables of sterilization protocols were compiled in following questions:

1. What types of sterilization methods you use in your clinic?
2. Do you personally sterilize instruments or your assistant is assigned for this purpose?
3. Which method you use for mechanical dislodgement of debris from instruments?
4. Which chemical you use for disinfection of instruments?
5. At what temperature your autoclave operates?
6. How often do you check sensitivity of your autoclave?
7. Do you use pouches or directly place instruments in autoclave?

All collected data was parted according to city, categorized according to questions and then manually calculated.

RESULTS

Questionnaire was distributed and collected by undergraduates from both cities. Total 43 questionnaire forms were collected from Karachi and 37 were collected from Hyderabad. Steam autoclaving was found to be preferred method of sterilization in both cities. Analyzed data shows autoclaving without disinfection as the favored method of sterilization; 86% in Karachi as compared to Hyderabad, which shows

Table No.1: Results from both cities compared.

Region	
Karachi	**Hyderabad**
Total number of surveyed: 43	Total number of surveyed: 37
Methods of sterilization:	
Autoclaving: 86% Autoclaving+Disinfection: 14%	Autoclaving: 29.7% Autoclaving+Disinfection: 70.27%
Method of mechanical dislodgement:	
Brushing: 88.37% Ultrasonic method: 4.65% None: 7%	Brushing: 81% Ultrasonic method: 13.5% None: 5.4%
Who sterilize:	
Dentist: 9.3% Assistant: 69.7% Both: 20.9%	Dentist: 13.5% Assistant: 54% Both: 32.4%
Disinfectants:	
Formaldehyde: 9.3% Glutaraldehyde: 4.65%	Formaldehyde: 21.62% Glutaraldehyde: 16.21% Chlorine compound: 21.62% Iodophor: 2.7% Other: 8.1%
Autoclave temperatures:	
121°c: 53.48% 125°c: 13.95% 132°c: 13.95% 134°c: 13.95% 138°c: 4.65%	121°c: 62.16% 125°c: 2.7% 132°c: 21.62% 134°c: 2.7% 138°c: 10.81%
Use of pouch during sterilization:	
With pouch: 100% Without pouch: 0%	With pouch: 73% Without pouch: 27%
Frequency of checking autoclave sensitivity:	
Never: 37.21% Once weekly: 23.25% Once a month: 20.93% Every 6 months:13.95% Once a year: 4.65%	Never: 60% Once weekly:19% Once a month: 8% Every 6 months: 13% Once a year: 0%

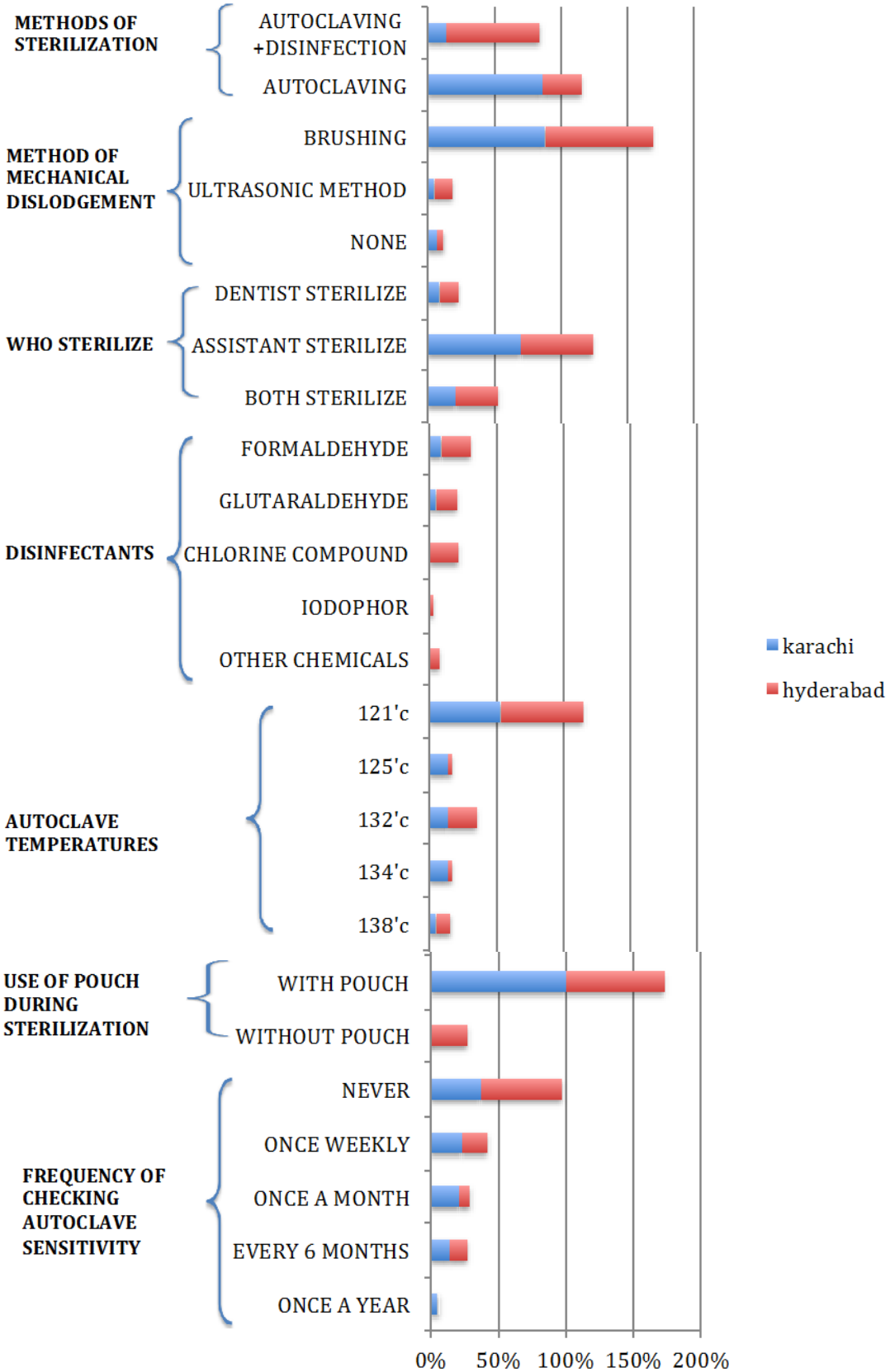

Figure No.1: Results in bar chart form

disinfection prior to autoclaving in 70.2% practitioners. Brushing was the preferred method for mechanical dislodgement of debris in both cities, Karachi 88% and Hyderabad 81%. 13.5% of practitioners of Hyderabad performed sterilization by themselves while in Karachi only 9.3% performed themselves. Wide diversity of disinfectants were found to be used in Hyderabad (formaldehyde, glutarldehyde, chlorine compound, iodophor) as compared to Karachi (formaldehyde and glutaraldehyde). Preferred autoclaving temperature for both cities was 121ºC, Karachi 53.48% and Hyderabad 62.16%. Maintaining sterilization by using pouch during autoclaving was found more extensively in Karachi 100% in contrast to Hyderabad 73%. Neglecting checking of sensitivity of autoclave was found to be in greater odds in Hyderabad 60% than Karachi 37.21%. Differences in sterilization methods between two cities are compared in figure and table.

DISCUSSION

Karachi and Hyderabad two cities where mostly all patients are diverted from rural areas of Sindh to seek medical and dental health were assessed for intra city and inter city variations in sterilization protocols. Due to low literacy rate in Pakistan patients have no concept of sterilization in most rural areas of Sindh, Pakistan. Government has never crosschecked any private clinics for quality assurance and level of care being provided to patients. Only 200 qualified dentists are working in the rural areas of Pakistan that make up 70% of the country population. thus 30% populations have access to the qualified dentists.. Increased awareness about risks of transmission of infection through blood and saliva on dental instruments led to used mechanical cleaning of before putting in autoclave. By using different chemical technique. In this study, 86 % sterilization autoclave with chemical sterilization 14% at Karachi compare to Hyderabad is 29% and chemical sterilization 72% . which is almost same in previous studies Sofola and Savage 84.1%, Sote 92% and Omolara 79.2%.[25] . The use of chemical disinfectants was 14% in Karachi and Hyderabad 72% in this study, compared to local study in Karachi Pakistan

The use of disinfectants was 89.4% Siddiqui etal 2014.in this study mechanical debridement by brushing method in both cities Karachi dental clinics 88% and Hyderabad dental clinics 81% .compare to other studies local and international did not mention about mechanical debridement in articles . although mention in different books. miller M Scully C 2015. In this study who is sterilize the instrument at dental clinic, dental surgeon and assistant in Hyderabad assistant doing more sterilization compare to Karachi. In international its performed by dental assistant. different chemical disinfectant used in both cities. most commonly used Formaldehyde: Glutaraldehyde. autoclave temperatures in both cities according to international standard .in this study pouch used in sterilization process in Karachi 100% compare in Hyderabad 72% no study were find for pouch sterilization. Survey shows significant negligence frequency checking of autoclave used in dental clinic , as the alarming point to be dental practitioner its properly sterilized instruments.

CONCLUSION

Survey shows steam autoclaving as primary method of sterilization. Brushing was preferred method of mechanical dislodgement of debris. Formaldehyde and glutaraldehyde were common disinfectants in both cities. Preferred autoclave temperature was 121ºc. Use of pouch was neglected in Hyderabad. Importance of checking of autoclave sensitivity was over sighted in both cities but on different scale.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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