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Glass Bead Steriliser Used As Chair Side Sterilisation in the Dentistry – A Research Article

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Abstract:

Objective: To study the efficacy of glass bead sterilizer (GBS) by using *Enterococcous as a biological indicator*.

Materials And Methods: This study is done with Endodontic K files and cuvettes which is sterile in condition.

Background: Glass bead sterilizer (GBS) is primarily used for sterilizing small handed instruments and also for micro propagation in dentistry. These units kill most of classes of fungi, bacteria and virus. It provides unique challenges to maintain sterile instruments in a practical and cost effective manner. Even though it is one of the older sterilizing methods, still now it is used as chair side sterilizer of hand instruments especially for sterilizing endodontic files.

Result: This study shows that sterilization done by Glass bead sterilizer was 98-100 % effective for the small handed instruments.

Key words: Enterococcous sp, sterilization, K files, cuvettes and glass bead sterilizer.

INTRODUCTION:

Infection control is the major problem in medicinal and dental health care settings. Infection control is important because both direct and indirect contamination leads to transmission of infectious agents. This type of control can be reduced by sterilizing technique of the instruments.(1) Sterilization is a term that removes or kills all forms of fungi, bacteria, viruses, spore forms etc present in a specified region such as a surface, a volume of fluid, medication, or in a compound such as biological culture media**.(**2)There are different types of sterilizing methods like cold sterilization, hot salt sterilization, glass bead sterilization, autoclave and dry heat autoclave that are used for sterilization purpose. (3)The Council on Dental Therapeutics and Council on Dental Practice recommended the use of glass bead sterilizer for sterilization of intracanal instruments for a period of 10 to 15 seconds at a temperature of 425-475 ^{o} F as it provides rapid sterilization.(4) This study is done to prove that Glass bead sterilizer is effective for sterilizing small handed instruments in the day to day life of the dentistry.

MATERIALS:

Enterococcous species, Endodontic files (15 pieces), cuvettes, sterile gauze, surgical spirit, and fresh broth.

METHADOLOGY:

Endodontic K files and cuvettes are sterilized using autoclave for 30 mins.*Enterococcous* are subcultured for 24 hours at 37* C. Macfarland preparations (0.5%) was made and taken in the test tube. *Enterococcous* suspension was made by comparing the quantity with 0.5% Macfarland solution. Fresh broth are transferred into cuvettes using syringe. *Enterococcous* are coated at the tip of the K files. K files are then wipped with cotton gauze which is dipped in the spirit. K files are then exposed into Glass bead sterilizer such that beads are covered 2/3rd of the cup. K files are exposed at various seconds of intervals like 2 seconds ,4 seconds, 6 seconds till 14 seconds at 240* C . Exposed K files are transferred into cuvettes . Then the cuvettes are incubated at 37*C for a day. After 24 hours the test tubes are observed for the presence or absence of the turbidity by comparing control group.

RESULTS:

Observed broth was clear and absence of turbidity was seen from 2 seconds till 14 seconds. This proves that K files which were contaminated with *Enterococcous* are killed at 2 seconds using glass bead sterilizer.

DISCUSSION:

Glass bead sterilizer is a sterilizing instrument, which is commonly used in the endodontic dentistry. It is mainly used for sterilizing the working ends of endodontic files and reamers by placing them in a container containing glass beads heated upto approximately 225°C (437°F) for a defined period of time.(5)Glass bead sterilizer works on the principle of intense dry heat. It has been confirmed that intense dry heat damages vegetative and spore forms of bacteria.(6) Glass bead sterilizers work by heating glass beads to 250 °C. Instruments are then quickly doused in these glass beads, which heat the object while physically scraping contaminants off their surface. Glass beads should be less than 1mm in size because larger beads are not effective in transferring heat due to large spaces between the beads. The instruments to be sterilized are immersed into heated up glass beads and left for period of time for specific instruments. Glass bead sterilizer has disadvantage that beads which are less than 1 mm in diameter get struck in the instruments when they are introduced into the root canal.(7)

In this study, K files are heated up from 2 seconds till 14 seconds. This result showed that glass bead sterilizer was able to destroy the Enterococcous from 2 seconds. As glass bead sterilizer shows good sterilization within few seconds, it is comfortable for sterilizing all small handed instruments in the dentistry.

CONCLUSION:

Even though many sterilizing methods are used for sterilization glass bead sterilizer has efficiency to destroy the microorganisms. Since glass bead sterilizer have capacity to kill the all forms of microbes in 2 seconds it can be used as chair side sterilizer in the dental practice especially in endodontic dentistry .

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