

An Efficacy of Sodium Hypochlorite in Disinfecting the Contaminated Dental Instruments:

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Abstract:

Aim:

The aim is to determine the anti microbial activity of sodium hypochlorite in disinfecting the contaminated dental instruments.

Objective:

To evaluate the anti microbial activity of sodium hypochlorite in disinfecting the dental instruments effectively where in this study bacteria acts as a indicator for demonstrating the effective action of sodium hypochlorite against the contaminated dental instruments.

Background:

The discarding jar contains different population of microbes present. Sodium hypochlorite claims to act on the bacteria and as an anti corrosive agent for the dental instruments. Hence ,this study helps to analyse the anti microbial activity of sodium hypochlorite used safely on instruments and it's duration of exposure.

Method:

The samples are collected and Placed in the dental tray . Samples are evaluated before adding sodium hypochlorite and after adding 5% sodium hypochlorite after 60 minutes.

Reason:

Sodium Hypochlorite is the only chemical which has an activity against virus. Hence there is no alternative chemical used, sodium hypochlorite is used in a safer way to prevent the deleterious effect on the dental instruments.

INTRODUCTION:

Hypochlorite in general are strong oxidizing agents. Commercially they are used as an alternative to chlorine gas for chlorination of domestic water supplies and swimming pools, and in cooling towers of air conditioners and power stations to control biofouling. They corrode most metals except titanium and some forms of stainless steel but when used in a ideal concentration and duration of exposure sodium hypochlorite serves as an disinfectant on the contaminated dental instruments.(1,2).Sodium hypochlorite is is also an hydrolyzing agent.(3) It is bactericidal and proteolytic.(4) The antimicrobial effectiveness of sodium hypochlorite, based in its high pH (hydroxyl ions action), is similar to the mechanism of action of calcium hydroxide. The high pH of sodium hypochlorite interferes in the cytoplasmic membrane integrity with an irreversible enzymatic inhibition, biosynthetic alterations in cellular metabolism and phospholipid degradation observed in lipidic peroxidation.The amino acid chloramination reaction (reaction 3) forming chloramines interferes with cellular metabolism. Oxidation promotes irreversible bacterial enzymatic inhibition replacing hydrogen with chlorine. This enzyme inactivation can be observed in the reaction of chlorine with amino groups (NH₂-) and an irreversible oxidation of sulphhydryl groups (SH) of bacterial enzymes (cystein).Thus, sodium hypochlorite presents antimicro-

bial activity with action on bacterial essential enzymatic sites promoting irreversible inactivation originated by hydroxyl ions and chloramination action.(5)

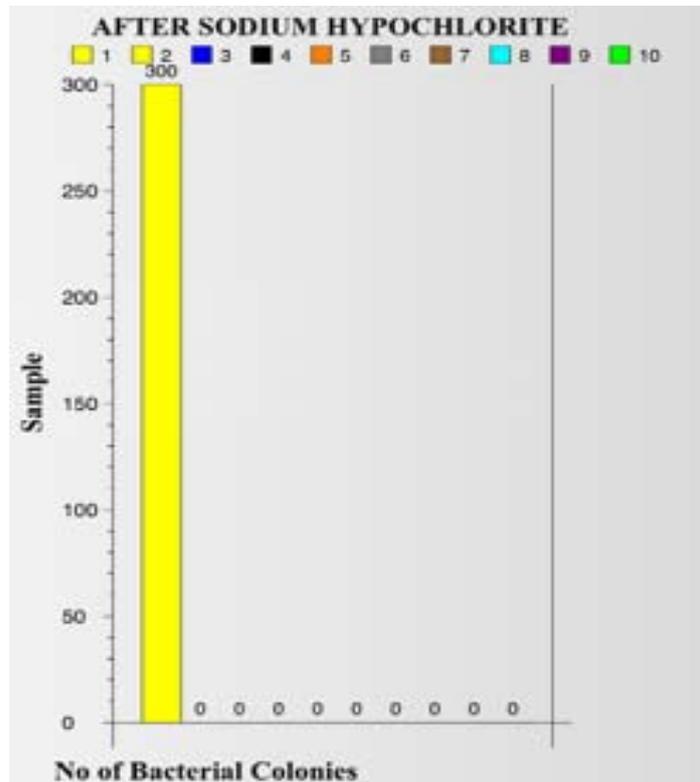
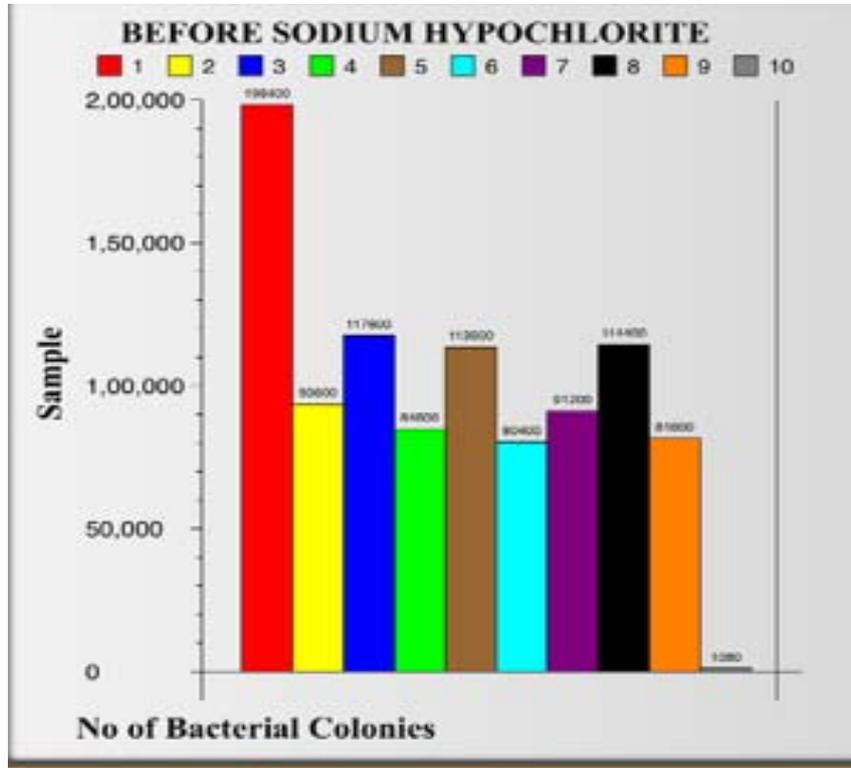
MATERIALS AND METHOD:

Ten samples of the contaminated dental instruments were placed in a tray .Swabbings were obtained from the contaminated dental instruments in the tray and it was cultivated in a agar culture dish. In the agar culture dish ,10 micro litres of the sample was taken with the help of a micropipette and was dispensed in the agar culture dish with the help of the bacteriological loop. The bacteriological loop helps to streak the sample completely in the culture dish with agar medium. The culture dish is now inoculated at a temperature of 36 degree Celsius in the incubator. The culture dish after incubation contains large number of bacterial colonies. The bacterial colonies in the culture dish was counted by dividing the culture plate into sections. To obtain the total bacterial count ,the total count of one section is multiplied with the the number of sections in the culture plate.the same procedure is followed for the ten contaminated samples. Similarly,ten samples of contaminated instrument was placed in a tray containing 5% sodium hypochlorite and swabbings were taken from the tray after a duration of an hour and the swabbings were cultivated in the agar culture dish and the same procedure is followed. The total bacterial count was obtained.

RESULT:

The swabbings which was taken from ten samples and was inoculated before adding sodium hypochlorite, it Showed the following result .The bar diagrams explains that the samples had large number of bacterial colonies. Similarly the contaminated dental instruments were placed in a dental tray which contained a concentration of 5%

sodium hypochlorite and the swabbings were taken after an hour and was inoculated and it showed the following result. The bar diagrams explains that sodium hypochlorite as helped in disinfecting the contaminated dental instruments having zero percentage of bacterial colonies .



DISCUSSION:

Numerous studies have recommended cleaning contaminated dental instruments between uses is essential to minimise the risk of cross infection because,identification of debris on the dental instruments raise important questions with regard to the potential for cross infection.

Mechanical cleaning can also be done to remove significant debris from the contaminated dental instruments,but it dose not totally help in cleaning the instrument. Sodium hypochlorite a potent disinfectant ,has the ability to dissolve the organic material. Therefore, the results from the present study,indicates that ,the duration of an hour exposure of 5% sodium hypochlorite has resulted in 100% of bacterial reduction, so it's is essential to kill the microbes present in the contaminated dental instruments. The 5% concentration of sodium hypochlorite is also effective against HIV and Hepatitis-B. Hence sodium hypochlorite used in appropriate time and of 5% concentration has helped to achieve disinfection of the contaminated dental instruments effectively.

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