preparation are used concomitantly in order to cleanse the root canal system. Chemical preparation involves thorough flushing with effective irrigants. The desirable properties of an irrigant therefore include, its ability to dissolve pulp tissue remnants, remove the smear layer, and be anti-microbial in nature. Scientific evidence relating to the desirable properties of an irrigant reveals that sodium hypochlorite is currently the irrigant of choice and is preferred by most clinicians. It has proven its worth as an effective antimicrobial agent, eliminating even spore forming organisms and is an excellent tissue solvent aiding in the debridement of the canal system.

Sodium hypochlorite is an effective antimicrobial agent against *E. faecalis*. However, concerns as to its effect on vital periradicular tissues still persist. A bis-biguanide, chlorhexidine gluconate, is a known antimicrobial agent effective against *E. faecalis* and is used by most clinicians. Further, some authors have reported lower toxicity for this as compared to sodium hypochlorite. These advantages however fail to make up for its lack of tissue dissolving property and inability to remove the smear layer.

Doxycline, a broad spectrum antibiotic and hydroxy derivative of tetracycline has shown great potential for expanded use in the treatment of bacterial infections in different parts of the body. This drug has been widely used in periodontal therapy. Doxycline is the most potent anti-collagenase antibiotic among commercially available tetracyclines. Tetracyclines readily attach to dentine and are subsequently released without losing their antibacterial activity. This property creates a reservoir of active antibacterial agent which is released from dentin in a slow and sustained manner. Doxycline has a low pH and has shown to remove the smear layer. Doxycline is an effective antimicrobial agent against *E. faecalis*.

There are no known reports comparing the antimicrobial efficacy of doxycline when used in combination with sodium hypochlorite or chlorhexidine against this organism. Hence the present study was undertaken to evaluate and compare the antimicrobial efficacy of 5% doxycline, 2.5% sodium hypochlorite, 0.2% chlorhexidine when used alone and in combinations.

**MATERIALS AND METHOD**

The standard strain of *Enterococcus faecalis* (ATCC 29212) was used as a test strain. Four morphologically similar colonies were picked up from an agar medium with a wire loop and the growth was transferred to a test tube containing 4ml of sterile peptone water. The antimicrobial activity was carried on sheep blood agar (HiMedia Pvt. Ltd, Mumbai, India) as per standard protocol of inoculum preparation. After adjusting the inoculums to 0.5 McFarland tube the lawn culture was done on blood agar plates. A total of 5 wells per plate with a diameter of 6mm and depth 4mm were made equidistant from each other. A total of 200 wells were made, 40 for each group and 50 μl of the test irrigant solution were pipetted into each well. The various test irrigants studied are as follows;

Group A (CHX) – 0.2% Chlorhexidine gluconate (Kasturba Hospital Pharmacy, Manipal, India)