Introduction:

The success of endodontic treatment relies on the correct diagnosis, proper access and chemomechanical preparation. However complete sterilization of pulp space is not always achieved due to the extremely complex anatomy. Persistent endodontic infections are mainly due to retention of microorganisms in the dentinal tubules. *Candida albicans* and *Enterococcus faecalis* constitute 77% of the persistent asymptomatic infections. Irrigants not only are important for the removal of debris and dentinal chips produced during cleaning and shaping, but are of clinical importance in the eradication of the radicular infection and lubrication of dentinal walls.

Aim and Objectives:

To evaluate the efficacy of Sodium hypochlorite 5.25%, EDTA 17% and saline 0.9% as final irrigant with the inclusion of antifungal agents [Chitosan- silver nanocomposite (20%Ag), Fluconazole (0.2%), Clotrimazole (1%) and Amphotericin B (0.2%)] on *Candida albicans*.

Methodology:

Fifty freshly extracted intact human mandibular premolars were decoronated and instrumented until ISO size 50 K-file. The roots were coated with two coats of nail varnish and apical foramen sealed with Type II GIC (GC). Subsequently, the roots were sterilized in an autoclave for 15 minutes, at 121°C and 15 lb pressure. A suspension of *Candida albicans* was cautiously inoculated with 0.5mL of the freshly prepared suspension and was stored in a glass test tube. The samples were stored and incubated at 37°C and 91% humidity for 96 hours. Every 24 hours, the vials
containing the experimental teeth were replenished with freshly prepared suspension of *Candida albicans*. After 48 hours, aliquots were taken from each tooth using a syringe and plated on 4% Sabouraud dextrose agar plate to verify the growth of *Candida albicans*. At the end of 96 hours, teeth were removed from the glass test-tube vials and were divided into 5 groups (N=10). All the teeth were treated with the respective irrigating solutions for 1 minute and the antifungal agents were injected into the root canal by using a 26 gauge needle. A small amount of saline was introduced into the canal, and then an endodontic hand file was used in a filing motion to a level approximately 1mm short of the root apex. A 1µm inoculation loop was used to remove aliquots from the fluid and was plated on Sabouraud dextrose agar(4%). The plates were incubated at 36°C and 91% humidity for 48 hours. After the incubation period, the growth of *Candida albicans* was assessed with light microscopy at 400X. The number of Colony Forming Units (CFUs) of *Candida* serves as a measure of the antifungal activity.

**Results:**

CFU was determined for all five groups. Control group (5.25% NaOCl, 17% EDTA and 0.9% saline), 1% Clotrimazole and Chitosan-silver nanocomposite showed complete inhibition in all the samples. 0.2% Fluconazole and 0.2% Amphotericin B showed complete inhibition in 8 samples and reduced CFU in 2 samples. 0.2% Fluconazole showed better inhibition of *Candida albicans* compared to 0.2% Amphotericin B.
Conclusion:

The results of the study showed that the use of endodontic irrigants along with the antifungal agents has the ability to inhibit the growth of *Candida albicans*. Hence it can be used as an adjunct with conventional endodontic irrigants.

Clinical implications:

The use of nanoformulations as a root canal irrigant might prove to be advantageous considering the several undesirable characteristics of standard irrigants and frequently used antimicrobials. Further research is warranted to conclusively recommend nanoformulations as root canal irrigants.