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Evaluation of flowability, pH and calcium ion release of high-plasticity cements

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Abstract

The aim of the study is to evaluate the physical and chemical properties of high plasticity calcium silicate-based cements (MTA HP, and MTA Flow) and to purpose a novel high plasticity cement composed of tricalcium and dicalcium silicate, bismuth oxide, zinc oxide and in the liquid, distilled water and water-soluble polymer. The association of zinc oxide in MTA Flow will be also evaluated to inhibit dental discoloration verified in a pilot test. The flowability, pH and calcium release will be evaluated.

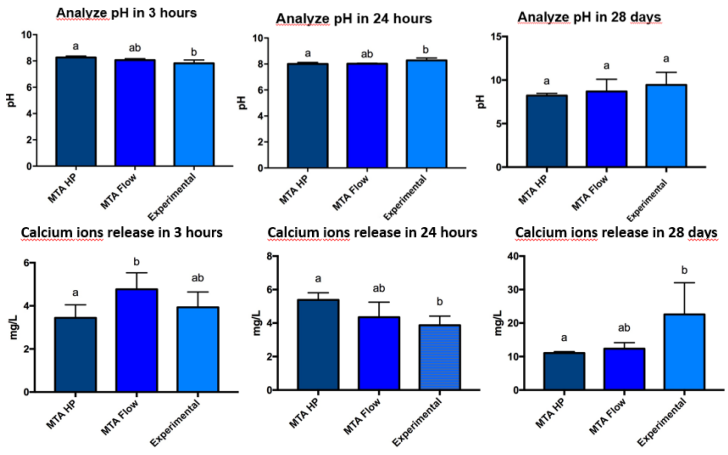
Key words: *Endodontics. Zinc oxide. Materials testing.*

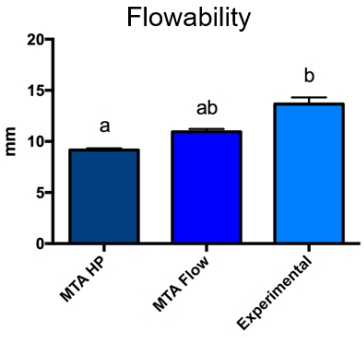
Introduction

Repair procedures have an important role in Endodontics. Conservative treatments allows the maintenance of teeth in functional conditions preventing future occlusal changes or bone loss. With this objective, mineral trioxide aggregate has been widely used. The uses for MTA includes perforations sealing, treatment of root fractures, pulp capping, apicification, retrograde fillings in apical surgeries and revascularization procedures.

Results and Discussion

The MTA HP showed the lower flow rates (9.15 ± 0.16), while the experimental the higher (13.65 ± 0.64) ($p > 0.05$). The pH of the cements after 3 and 24 hours was about 8. After 3 hours immersion, statistical diferences were verified between MTA HP and experimental (8.26 ± 0.11 and 7.82 ± 0.24, respectively) ($p < 0.05$). After 24 hours, was observed higher values for experimental cement (8.28 ± 0.17) and lower for MTA HP (8.00 ± 0.12). In both periods, MTA Flow presented intermediate values ($p > 0.05$).





Conclusion

The experiemental cement showed high flowability and pH, which indicates that this cement is comparable to the novel high-plasticity cements MTA HP and MTA Flow.

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