Author's response to reviews

Title: Cytotoxicity of QMix™ endodontic irrigating solution on human bone marrow mesenchymal stem cells

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Response to the comments

Authors aimed to evaluate cytotoxicity of the QMix™ irrigating solution on immortalized human bone marrow mesenchymal stem cells (hTERTMSC-C1) using cell viability assays, cell morphology evaluation, and fluorescence light microscopy and compare with 5.2% NaOCl.

The study is well designed but this reviewer has some concerns;

1) Fluorescence examination only is not enough since some markers responsible apoptosis (i.e. caspase family, Bcl-2 family) should be evaluated to mention apoptosis. So this explanation or assumption should be revised.

We agree with the reviewer that Fluorescence examination alone is not conclusive evidence for apoptosis. Since our main objective is to compare two currently available root canal irrigants, in terms of safety, the mode of cell death has least importance to us. Hence as per the suggestion of the reviewer the conclusion and discussion has been modified. An additional reference is also included for those readers interested in this area. The modified areas are highlighted in the manuscript


2) QMix irrigation solution composed of CHX and EDTA, and CHX is severely cytotoxic agent for periodontal ligament and gingival fibroblasts. How authors explain QMix is less cytotoxic for hTERTMSC-C1 when compared to NaOCl especially for short term (2 and 4 hrs)?

Based on the available literature, QMix™ is relatively less cytotoxic than NaOCl. This is based on the in vitro and in vivo studies already available in the literature
(Stojicic et al., 2012; Wang et al., 2012; Chandrasekhar et al., 2013). Our results also showed similar findings. Based on our findings and available evidence, we can’t speculate that QMix™ is more cytotoxic than NaOCl. Also the toxicity of CHX and EDTA on periodontal ligament and gingival fibroblasts is beyond the scope or objective of this study.

3) If authors used primary cell line for this study, please speculate the possible difference in the results?

Since this is a comparative study to evaluate the cytotoxicity of two clinically used root canal irrigants, we don’t expect a major advantage of using primary cell line.

The primary cell culture is mainly used for simulating the in-vivo condition. As a matter of fact ex-vivo culture is closer to real body condition than working on line cells. But line cells are mostly used in order to check the potency of drug, especially in cytotoxicity assays. Primary cell lines have the following limitations - they are not well characterized, have limited life span, slow in proliferation and finally nothing to compare with. Primary cells derived from different patients can behave differently in culture conditions depending on the genetics and age of individuals from whom the tissue was derived. Also, fibroblasts derived from different parts of the body may have different characteristics.

Hence it can be concluded that the current study design is sensitive enough to establish the objectives of the study.

References