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Biography

Marwa Samir Naga, PhD candidate, Faculty of dentistry, Alexandria University, Egypt. I published two papers in reputed journals (BMC Oral Health Dental Journal and International Dental Journal). PMID: 39277754, PMID: 40378507. I participated and attended several many conferences in my country Egypt.

Assessment of Novel Boron-doped Mesoporous Bioactive Glass Nanoparticles Loaded Alginate Hydrogel In Dogs

Abstract:

Introduction: This study aims to evaluate, histologically, the regenerative potential of novel injectable boron- doped mesoporous bioactive glass nanoparticle (BMBGNPs) loaded alginate hydrogel.

Methods: Formulation and optimization of the novel alginate/ BMBG NPs (20 wt. %) loaded composite hydrogel were performed. Next, sixty-six teeth of three dogs were allocated into three groups (each including 22 teeth) according to post –operative follow up period: group I: 2 weeks, group II: 4 weeks, group III: 8 weeks. Each group was further subdivided according to pulpotomy filling material into two subgroups, with subgroup 1 (alginate/ BMBGNPs (20 wt. %) loaded hydrogel) and subgroup 2 (MTA). Complete pulpotomy was executed. One dog was sacrificed after 2, 4 and 8 weeks. Teeth were prepared for histological evaluation assessing: inflammatory cell response, pulp tissue organization, dentin bridge formation. Mann-Whitney U test was employed to evaluate the scores of histological parameters between tested materials ($p \leq 0.05$).

Results: Alginate/BMBG NPs (20 wt. %) loaded hydrogel showed normal pulp configuration at 2 and 4 weeks which was enhanced after 8 weeks ($p \leq 0.05$). Moderate inflammatory reaction was noted at 2 weeks which was improved after 4 and 8 weeks ($p \leq 0.05$). MTA group demonstrated less favorable pulpal response and inflammatory reaction with statistically significant difference across all observational periods ($p \leq 0.05$). After 8 weeks all teeth in group 1 exhibited thickest dentin bridge ($p \leq 0.05$).

Conclusions: Alginate/BMBG NPs (20 wt. %) loaded hydrogel favors the promise to regenerate dentin and maintain pulp vitality reaching the desired level as alternative to MTA.