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Formulation, in-vitro characterization and clinical evaluation of curcumin in-situ gel for treatment of periodontitis

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Abstract:

This study aimed to develop syringeable in-situ curcumin (cur) gel for the treatment of periodontal pockets as well as to evaluate the clinical efficacy of Cur in-situ gel formulation. Different in-situ gel formulations of Cur were prepared using 30% of pluronic F127, and 1% of carbopol P934. The formulations were evaluated regarding gelation temperature, pH, viscosity, syringeability study, in-vitro release and chemical stability of cur. The effect of aging of gel formulations for 3months in refrigerator was investigated. The selected formulation was clinically evaluated through the determination of probing depth, plaque index, and bleeding index at baseline and 1 month after application. The formulations showed accepted gelation temperature ranging from 28 to 34 ˚C and all had pH value of 4. The viscosity of the formulations at 4 ˚C ranged from 19 000 to 37 000 cP. All formulations were easily syringeable through 21 gauge needle at cold temperature. Curcumin stability during the release study was maintained. Aging showed no significant effect on release profile, drug content, or the pH after 3 months, while it showed a slight increase in viscosity with concomitant decrease in gelation temperature. Selected formulations delivered into periodontal pocket evaluated clinically showed to be effective. The treated group revealed that the adjunctive use of intracrevicular 2% curcumin in-situ gel adjunct to mechanical treatment in patients with adult periodontitis could aid in significant clinical reduction of probing depth, bleeding index, and to less extent of plaque. This indicates that curcumin in this novel drug delivery system is an excellent candidate for periodontal disease treatment. © 2017 The Author(s).

Reference: