

Osteoporosis, an Approach of Treatment via Chitosan- β -Glycerophosphate-Fluoride Gels [†]

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Abstract: In recent years, chitosan—glycerophosphate hydrogels have been extensively studied for pharmaceutical applications. In the current work, this matrix was tested as a platform for sodium fluoride release in the gastrointestinal tract. Fluoride release was selected due to its well-known use in osteoporosis treatment. For this purpose, microscopy observation, infrared spectroscopy, and rheological characterization were carried out. In addition, stability studies of the gels and the release profiles of the active principle in different media were studied. In aqueous media with pH between 4 and 7, the systems proved stable and maintained a controlled release of the active principle for more than 6 hours. To compare the oral administration of sodium fluoride included in the hydrogel or in a water solution, *in vivo* studies were performed. Fluoride pharmacokinetics was similar when the drug was administered with both formulations. However, when the active principle was administered with the hydrogel, fluoride absorption was higher, and drug-related side effects were absent. In consequence, Chitosan - β -glycerophosphate hydrogels containing sodium fluoride could be considered a suitable formulation for oral osteoporosis treatment.

Keywords: gastrointestinal delivery; osteoporosis; chitosan hydrogel, fluoride.

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Conflicts of Interest

The authors declare no conflict of interest.