NANOPARTICULATE SYSTEMS FOR INTRAORAL DRUG DELIVERY

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Abstract

Context: Intraoral drug delivery as mucosal delivery pathway provides a huge platform in the pharmaceutical field.

Objective: Combining mucoadhesiveness and controlled release of thio-poly acrylic acid as advanced excipient for buccal drug delivery.

Materials and methods: Mediated by carbodiimide cysteine was covalently attached to poly acrylic acid. This thiomer was assessed with regard to cytotoxicity, stability, mucoadhesion, and rheology as well as release behavior of Lidocaine.

Results: Stability assays of thio-poly acrylic acid was complying with United States Pharmacopeia (USP) requirements. Mucoadhesion assay such as tensile (TWA), bioadhesion, rotating cylinder revealed as this thiomer was superior in comparison to non-thiolated poly acrylic acid with 7.61-fold, 2.8-fold, 5.61-fold improvement, respectively without any toxic effect. Lidocaine release showed 1.98-fold more controlled release over 3 h in comparison to unmodified poly acrylic acid.

Conclusion: Taken the findings in consideration, thio-poly acrylic acid provides excellent stability, controlled release and superior mucoadhesive features. The prolonged residence time of thio-poly acrylic acid represents a pillar in the buccal drug delivery.

Keywords: Intraoral delivery, mucoadhesiveness, mucus, nanoparticles, polymer

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