ABSTRACT

THE EFFECT OF METHYLCELLULOSE 4 mPa.s CONCENTRATION ON PHYSICAL CHARACTERISTICS AND DISSOLUTION RATE OF BEADS COATED DRIED NANOSUSPENSION OF HESPERETIN-POLOXAMER 188

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The aim of this study was to determine the effect of methylcellulose 4 mPa.s concentrations as coating polymer on dissolution rate and physical characteristics of beads coated dried hesperetin-poloxamer 188. The initial hesperetin (HPT) nanosuspension was formed using poloxamer 188 (P188) 29% (w/w) processed with top down wet ball milling (target size of <200 nm). The HPT-P188 nanosuspension was then added with two different concentrations of methylcellulose 25% (F1) and 50% (F2) (w/w), PEG 6000 and tartrazine. Those nanosuspensions were then evaluated for its particle size, content and dissolution. Furthermore, those nanosuspensions were then conventionally dried in an oven at 50°C. Separately, nanosuspensions of HPT-P188-methylcelluose were then used to coat beads sized 710-850 µm. The beads layered with the dried nanosuspensions were also evaluated for their morphology and release of hesperetin. The results showed that nanosuspensions, with or without the methylcellulose, released hesperetin within <30 minutes and instantly reached 100%. The percentage of dissolved nanosuspension dried with oven and coated beads HPT-P188 conventionally dried nanosuspensions decreased and not identical with their nanosuspensions. Morphology of the dried nanosuspension and coated beads was observed using SEM. The diffractogram showed that during the milling and drying at 50°C, hesperetin was still in its crystalline form and with the addition of MC, the diffraction peak decreased. However, in coated beads the diffraction peak were only dominated by the core beads, because of the coating thickness. Methylcellulose in both F1 and F2 were not able to prevent nanocrystal agglomeration hence altered the release of hesperetin.

Keyword: Nanosuspension, hesperetin, poloxamer 188, methylcellulose 4 mPa.s, coated beads, polymer coating