ORIGINAL RESEARCH

Evaluation of the disintegrant property of co-processed sorghum starch-silicon dioxide excipient in chlorpheniramine orodispersible tablets

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ABSTRACT

Background: Fast dissolving or orodispersible tablets are highly desirable in groups such as children, uncooperative, nauseated, or those on reduced water intake to ease the difficulties associated with swallowing the conventional solid dosage forms.
Objectives: The work aimed to evaluate the disintegrant property of sorghum starch-silicon dioxide co-processed mixture in the formulation of chlorpheniramine orodispersible tablets.
Method: Different batches of orodispersible tablets of chlorpheniramine maleate (4 mg) were prepared by direct compression method using Avicel® as a bulking agent and four different types of disintegrants (sorghum starch, co-processed sorghum starch-colloidal silicon dioxide, sodium starch glycolate and croscarmellose sodium) at varying concentrations (5, 10 and 20 %). The formulated tablets were subjected to weight variation test, thickness, crushing strength, friability test, wetting time, water absorption ratio, disintegration test and *in-vitro* dissolution study.
Results: For tablets above 250 mg, it is expected that not more than two tablets should deviate from the average weight by 5% and none should deviate by more than 10%, all the formulations yielded tablets within this specification. The disintegration time of tablets containing 10% of disintegrants was all less than 60 s except those containing sorghum starch (SS) which took a long time. Similarly, the time taken to release 50 % of the drug ($t_{50\%}$) for tablets containing 10% sorghum starch was 25 s, 5 s for tablets containing 10% sorghum starch-colloidal silicon dioxide excipient and 8 s for tablets containing 10% of either croscarmellose sodium or sodium starch glycolate. The differential scanning calorimetry study results suggested that the drug and the excipient are compatible.
Conclusion: The results show that sorghum starch-silicon dioxide co-processed mixture can be used as an alternative to croscarmellose sodium and sodium starch glycolate in orodispersible tablet formulations.

Keywords: disintegrant, co-processing, chlorpheniramine, orodispersible tablets, sorghum starch