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Comparison of Solvent Casting and Spray Casting Method on Compounding of an Orally Disintegrating Film Containing Amlodipine Besylate

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Abstract

The amlodipine besylate tablet is one of the most highly prescribed medicines to manage hypertension in the geriatric population. However, the difficulty of swallowing tablets due to problems like dysphagia, fear of choking, and odynophagia has been identified as one of the contributing factors to non-compliance among geriatrics. Due to the swallowing factor among geriatrics, this study was conducted to compare two compounding methods of orally disintegrating

films, namely solvent casting and spray casting, to produce an orally disintegrating film containing amlodipine besylate. Different polymers were used to develop the orally disintegrating films, and the formulations were subjected to validation tests such as thickness, folding endurance, tensile strength, percentage of elongation, Young's modulus, disintegration, and dissolution. Chemicals like hydroxypropyl methylcellulose, carboxymethyl cellulose, glycerin, mannitol, sodium lauryl sulfate, citric acid, peppermint oil, and a coloring agent were used to formulate the orally disintegrating films. In addition, orally disintegrating films were prepared using the solvent casting and the spraying method. An increase in the polymer's concentration resulted in the formation of a greater mechanical strength. After a comparison between the hydroxypropyl methylcellulose and the carboxymethyl cellulose as film-forming agents, it was discovered that hydroxypropyl methylcellulose had greater mechanical film properties than carboxymethyl cellulose, except for the folding endurance. Moreover, hydroxypropyl methylcellulose was shown to have a better disintegration time, which was in the range of 30 minutes to 90 minutes, with a drug release of 95% to 100%, while carboxymethyl cellulose disintegrated at 6 minutes to 15 minutes with a drug release of 60% to 75%. On the other hand, both the solvent casting and spraying methods produced an evenly matched orally disintegrating film quality. Orally disintegrating films containing amlodipine besylate were developed and characterized. It was concluded that these orally disintegrating films have a great potential in the market and a profound ability in the reduction of geriatric non-compliance to antihypertensive drugs. © 2022, International Journal of Pharmaceutical Compounding. All rights reserved.

Indexed keywords

MeSH

Administration, Oral; Aged; Amlodipine; Carboxymethylcellulose Sodium; Drug Compounding; Humans; Hypromellose Derivatives; Solubility; Solvents; Tablets

EMTREE drug terms

amlodipine; carboxymethylcellulose; hydroxypropylmethylcellulose; solvent

EMTREE medical terms

aged; chemistry; drug formulation; human; oral drug administration; solubility; tablet manufacture

Chemicals and CAS Registry Numbers

Unique identifiers assigned by the Chemical Abstracts Service (CAS) to ensure accurate identification and tracking of chemicals across scientific literature.

amlodipine

88150-42-9

carboxymethylcellulose	8050-38-2, 9000-11-7, 9004-32-4, 9050-04-8
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hydroxypropylmethylcellulose	9004-65-3
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Amlodipine

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