DEVELOPMENT OF THE COMPOSITION AND TECHNOLOGY OF FAST-DISSOLVING TABLETS WITH NIMESULIDE

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Introduction. Nimesulide is a non-steroidal anti-inflammatory drug (NSAID) used for the treatment of various pain and inflammation conditions. However, its low solubility and slow dissolution rate limit its therapeutic efficacy. Therefore, the development of a fast-dissolving tablet formulation with nimesulide can improve its therapeutic efficacy and patient compliance. The aim of this study is to develop a fast-dissolving tablet formulation of nimesulide with improved dissolution rate and assess its physicochemical properties.

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Methods of research. Fast-dissolving tablets of nimesulide were prepared by the direct compression method using various superdisintegrants such as crospovidone, croscarmellose sodium, and sodium starch glycolate. The prepared tablets were evaluated for their physicochemical properties including weight variation, hardness, friability, disintegration time, and dissolution rate. The dissolution rate of the tablets was assessed using a USP type II dissolution apparatus in 900 mL of pH 6.8 phosphate buffer at 37°C ± 0.5°C.

Main results. The tablets prepared with crospovidone showed the lowest disintegration time (16.42 ± 0.58 s) and the highest dissolution rate (97.56 ± 2.43%) compared to tablets prepared with croscarmellose sodium and sodium starch glycolate. The tablets prepared with crospovidone also showed acceptable physicochemical properties such as weight variation, hardness, and friability. The optimized formulation contained nimesulide (100 mg), crospovidone (10 mg), microcrystalline cellulose (20 mg), mannitol (50 mg), and magnesium stearate (2 mg).

Conclusions. The developed fast-dissolving tablet formulation of nimesulide using crospovidone as a superdisintegrant showed improved dissolution rate and acceptable physicochemical properties. The optimized formulation can be a promising alternative to conventional tablets for the treatment of pain and inflammation conditions. Further studies such as stability testing and in vivo evaluation are recommended to assess the clinical efficacy and safety of the developed formulation.