FORMULATION AND EVALUATION OF ULTRAFAST DISSOLVING OROFILM CONTAINING OXCARBAZEPINE NANOFIBRE

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Abstract

The research aims to develop and assess ultrafast dissolving orofilm containing Oxcarbazepine (OXB) nanofiber for the prevention of epilepsy in infants and enhanced drug administration. The objectives include preformulation studies, formulation and evaluation of OXB nanofiber, and development of nanofiber incorporated ultrafast dissolving Orofilm. Preformulation studies encompassed solubility, melting point analysis, calibration curve construction, and compatibility studies using IT/FTIR Spectrometer. The formulation of OXB nanofiber involved optimizing polymeric solutions and electrospinning to achieve ultrafast dissolving properties. Evaluation parameters included particle size analysis, drug content determination, surface pH study, disintegration time, zeta potential analysis, XRD studies, film thickness, entrapment efficiency, folding endurance, SEM analysis, in vitro drug release, and stability study. Results indicated that the formulated nanofiber (Formulation F5) with 7% PVA and chitosan in a 70:30 ratio exhibited desirable characteristics, such as 93.21% entrapment efficiency and 96.41% drug content. Nanofibers demonstrated nanometer-scale particle sizes (95.5nm to 170nm), stability based on zeta potential values, and amorphous nature according to XRD diffractograms. In vitro drug dissolution revealed a fast and sustained release, with 91.35% cumulative drug release achieved within 12 seconds. Stability studies over 90 days showed no significant changes in thickness, surface pH, drug content, and entrapment efficiency. This successful formulation of ultrafast dissolving OXB nanofiber represents a promising approach for efficient drug delivery, particularly for pediatric and geriatric patients, showcasing the potential for novel nano drug delivery systems to ease administration in various patient populations.

Key words: Ultrafast-dissolving Oro-film, Oxcarbazepine (OXB) nanofiber, Electrospinning, XRD studies, Nano drug delivery systems