Formulation and Evaluation of nanosuspension of anti-psychotropic drug

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Abstract

The aim of this study was to prepare and characterize Risperidone nanosuspension to enhance the dissolution rate and oral bioavailaility of this drug. Risperidone is a BCS class II drug with high permeability and low solubility. Nanosuspensions are promising candidates that can be used for enhancing the dissolution of poorly water soluble drugs. In the present work, Nanosuspension was prepared using media milling method. One mg Risperidone in 10 ml distilled water were prepared in 20 ml vials using ZrO_2 beads (0.4-0.7 mm) as a milling medium and different concentration of stabilizer. Prepared nanosuspension was evaluated for saturation solubility, mean particle size, zeta potential and drug release properties. It was observed that optimized batch F9 containing 25mg of stabilizer and 7 gm of ZrO_2 beads having particle size of 217.4 nm with PDI 0.015 and zeta potential of -29.3 mV. The in-vitro drug release of the Risperidone nanosuspension was enhanced 91.92% in 60 min, relative to that of plain drug having 34.35% drug release in 60 min and marketed powder for suspension showed 47.36%. The particle size of batch F9 was 16.84 µm in suspension and 217.4

nm in nanosuspension, i.e. particle size decreased from µm to nm. It leads to increased particle surface area and solubility of drug.

Keywords: Nanosuspension, Risperidone, Media milling method, Zirconium beads, Poloxamer 407.