Formulation and evaluation of metoprolol tartrate extended release 50 mg tablets with Hydroxypropyl methylcellulose 4000 cps

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Abstract:
Cardiovascular disease is the most common cause of death in the world. Metoprolol tartrate is a β₁ selective blocker that is used in the treatment of cardiovascular disease.

The goal of this investigation was the formulation of metoprolol tartrate sustained release matrix tablets for use in arterial hypertension and ischemic heart disease.

In this study sustained release matrix tablets of metoprolol tartrate were prepared by wet granulation method using Hydroxypropyl methylcellulose (HPMC) 4000cps as the release-retardant agent. The other variables studied were the contents of magnesium stearate (Mg-St), used as lubricant, and polyvinyl pyrrolidone (PVP) k30, used as binder. The physicochemical properties of all the formulations were evaluated. Release studies were carried out according to USP35 (apparatus II, 50 rpm, medium: 500 ml phosphate buffer, pH 6.8). Stability studies have been initiated, according to ICH guidelines, on the optimum formulation.

The formulations with 15-20% of HPMC 4000cps, 5% PVP k30 and 4% Mg-St showed good physicochemical properties and release profile thus was selected for stability studies conducted at 40 ± 2°C and 75 ± 5% RH.

HPMC 4000cps is an effective matrix former that can extend the release of metoprolol tartrate to 20 hours. Increasing the percentage of HPMC 4000, up to about 20%, led to a reduction in the release rate. However, beyond that increasing HPMC content did not affect the release rate. Compared to the effect of HPMC 4000, increasing the amounts of PVP and Mg-St affected the release rate to a much smaller extent.

Keyword: Sustained release, metoprolol tartrate, in vitro- dissolution.