Abstract

Fixed Dose Combination (FDC) is a formulation of two or more active ingredients combined in a single dosage form available in certain fixed doses. They are designed to simplify the medication regimen and potentially improve compliance. They are used in the treatment of a wide range of conditions and are particularly useful in the management of HIV/AIDS, tuberculosis and malaria, which are considered to be the foremost infectious disease threats in the world today.

Rational drug combinations of anti-hypertensives are characterized by synergy - more effective blood pressure control with the combination than with each component alone, and a mechanism of action for each component that offsets the other’s adverse effects. e.g. diuretic + beta blocker, beta blocker + calcium channel blocker.

The present work encompasses of developing extended release formulation of M.succinate (BCS class I drug) by melt granulation technique. Furthermore, this formulation was combined with extended release formulation of poorly soluble Felodipine (BCS class II drug) to develop bilayer tablets of the two.

Tuberculosis (TB), a pervasive and deadly infectious disease of the respiratory system, is one of the main challenges in public health. There is need for a multi-drug regimen due to resistance of M.tuberculosis to anti-TB agents in both immunocompetent and HIV-infected populations. The current treatment course of TB faces many challenges; prime amongst them being the variable bioavailability of Rifampicin (RIF) in presence of Isoniazid (INH) from the prescribed FDCs.

In order to overcome the above challenges, the present work was aimed at redesigning the current FDCs to minimize the interactions between two classical anti-TB first line drugs by various approaches viz. segregated delivery, enteric delivery and extended delivery approaches.

All the above melt extruded formulations developed using extrudable polymers alone and in combination were characterized with respect to their thermal stability (TGA), chemical stability (HPLC), miscibility (DSC), crystallinity (pXRD) and surface morphology (SEM). The developed formulations were found to be stable as per ICH guidelines for six months.

Keywords: Anti-hypertensive, anti-TB, fixed dose combinations, hot melt extrusion, extended release, bioavailability