International Journal of ChemTech Research
CODEN(USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.10 No.5,pp 216-235,2017

Formulation and Optimization of Controlled Porosity Osmotic Pump Tablets of Zidovudine using Mannitol as Osmogen for the Treatment of Aids

Chinmayakeshari sahoo[1]*, Surepalli Ram Mohan Rao[2], Muvvala Sudhakar[3]

[1]Ph.D Scholar, Pharmaceutics Department, Faculty of Pharmacy, University College of Technology,Osmania University,Hyderabad,Telangana-500007, India
[2]Professor,Mekelle Institute of Technology, Mekelle University, Mekelle, Ethiopia.
[3]Professor and Principal, Department of pharmaceutics, Malla Reddy College of Pharmacy, Maisammaguda, Secunderabad,Telangana-500014, India.

Abstract: The present study was undertaken to develop controlled porosity osmotic pump tablets of zidovudine a nucleoside reverse transcriptase inhibitor for the treatment of acquired immune deficiency syndrome(AIDS).Zidovudine has the dose of 300mg 2 times daily as conventional dose. In this present study it is designed to prepare controlled release CPOP tablet once daily having 600mg dose.The tablets were prepared by wet granulation method using drug zidovudine as well as various excipients such as hydroxyl propyl methyl cellulose(HPMCE5LV) as controlled release polymer, mannitol as osmogen, microcrystalline cellulose(MCC) as diluent, starch as binder, magnesium stearate as lubricant and talc as glidant.The coating solution of core tablets were prepared by using cellulose acetate as membrane forming material,poly ethylene glycols 400,600,4000,6000 as flux regulating agent, acetone as solvent and sorbitol as porogen. The prepared tablets were evaluated for pre compression parameters, post compression parameters, in vitro drug release study, FTIR, DSC study and scanning electron microscopy study. Among the prepared formulationsZM4 batch shows 94.99% drug release in 16 hrs. The in vitro release kinetics were analyzed for different batches by different pharmacokinetic models such as zero order, first order, Higuchi, KorsmeyerPeppas and Hixson Crowell. The result of optimized formulation releases drug up to 16 hrs in a controlled manner and follows zero order kinetics and which is independent of the p^H and agitational intensity. Short term stability study (at 40±2ºC/ 75±5% RH for three months) on the best formulation indicated that there were no significant changes in hardness, %friability, drug content and in vitro drug release. FTIR and DSC study indicated that there was no drug excipient interaction.
Keywords: AIDS, wet granulation, in vitro drug release, stability study.

*****