

Pharma Middle East

November 02-04, 2015 Dubai, UAE

Lipid and safety profile assessment of atorvastatin calcium loaded oral biodegradable polymeric nanoparticles in rats

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Atorvastatin calcium (ATR) is a second generation statin drug prescribed for the maintenance of hyperlipidemia, atherosclerosis and cardiovascular complications. Despite of being blockbuster drug, its oral bioavailability is quite low (12%) and shows muscular toxicity. ATR loaded Poly (lactide-co-glycolic acid) nanoparticles (APLNs) has been successfully prepared to improve efficacy and safety profile of drug. Optimised batch of APLNs was subjected to pharmacokinetic, pharmacodynamic and safety profile evaluation in Charles Foster rats. Pharmacokinetic study results with APLNs exhibited a significant enhancement of bioavailability, plasma half-life and mean residence time of ATR than commercially available tablet (Astin). Plasma lipid profile (triglyceride, total cholesterol, low density lipoprotein cholesterol, high density lipoprotein cholesterol and very low density lipoprotein) of APLNs and Astin treated hyperlipidemic rats were compared to elucidate the efficacy of APLNs over Astin. The dose of ATR in APLNs group was one half than that of Astin group. Efficacy of APLNs, however, was found equivalent to that of Astin group. Plasma safety profile (creatinine, blood urea nitrogen, creatinine kinase, lactate dehydrogenase and aspartate amino transferase) of APLNs and Astin treated group were estimated. APLNs exhibited equal efficacy and better safety profile at 50% reduced dose of ATR as compared to Astin.

Biography

Nagendra Kumar is pursuing his PhD from Indian Institute of Technology (Banaras Hindu University), Varanasi (India). He is working in the field of nanoparticulate drug delivery system under the supervision of Professor B Mishra. He has qualified in IITJEE-2004, GATE-2008 and NET-2011. He has presented several poster/oral presentation in different national/international conferences/symposium/seminar. He is a Gold Medalist and IDMA Awardee for securing highest marks in the BHU in BPharm examinations. He has published several research articles in reputed journals.

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