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Studies on pharmacokinetic interactions and toxicity of Metformin with Glimepiride

Venkateshwarlu K, D Sandeep and D Titus
Vaagdevi College of Pharmacy, India

The combination of Metformin and Glimepiride is widely used to treat type 2 diabetes. The present study was carried out to study the pharmacokinetic interactions between these two drugs used in combination. An available RP-HPLC method for simultaneous estimation of Metformin and Glimepiride was revalidated for future use. Albino rats of either sex were randomly distributed into four groups of six animals in each; they are housed in well ventilated aluminium cages and maintained on uniform diet and temperature with 12 hour light and dark cycle. In this study, the blood was collected from orbital sinuses using heparinised capillaries into a micro centrifugation tubes contain anti-coagulant at 0, 1, 2, 4, 6, 8 and 12 hours after treatment. Plasma was separated by centrifugation and stored at -20 °C until further analysis. These samples are used to analyze for pharmacokinetic and pharmacodynamic toxicological i.e. SGOT-SGPT, Complete Blood Picture (CBP) and serum creatinine clearance. Metformin and Glimepiride levels were estimated by a sensitive RP-HPLC method. This study proves, single and multiple doses Metformin increases plasma concentrations of Glimepiride. There is significant increase in the AUC and decrease in clearance. In single dose studies this change could be because of the transient induction in CYP2C9. When Glimepiride is given in repeated doses (15 days) there could be induction of the microsomal liver CYP2C9 subsequently increasing the metabolism, decreasing clearance of Metformin and increasing the overall AUC. This combination has clearly shown the beneficial effect on the CBP i.e. significant improvement in blood cell count, lymphocytes and neutrophils in particular.

Biography

Venkateshwarlu K has completed his PhD from Kakatiya University, Warangal, India and he is working as Professor and Head, Department of Pharmaceutical Analysis, Vaagdevi college of Pharmacy. He has published more than 20 papers in reputed various associations like APTI etc.

venkataindica@yahoo.com

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