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Assessment of herb drug interaction study of *Sitagliptin* in combination with curcumin

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Curcumin is the principal curcuminoid of turmeric. It possesses antioxidant, antidiabetic, anticancer, antiviral, antifungal, antibacterial, and anti-aging activities. It is mainly metabolized by CYP3A4, CYP1A2, and CYP2C9 enzymes. Sitagliptin is an oral antihyperglycemic agent, belongs to class DPP-4 inhibitor. It is metabolized by CYP3A4 and CYP2C8 enzymes. In the drug interaction study of curcumin with sitagliptin, diabetes was induced in the albino wistar rats intraperitoneally using 55 mg/kg Streptozotocin (STZ). Then they were divided into four groups of six each. Group I treated with sitagliptin (10 mg/kg), group II treated with curcumin (80 mg/kg), group III treated with curcumin followed by sitagliptin and group IV treated with curcumin for 7 days and on the eighth day followed by sitagliptin. Blood samples were collected from an orbital puncture at time intervals between 0, 1, 2, 4, 8, 12, and 24hrs using heparinized capillaries. Different biochemical parameters were estimated by using respective methods for 28 days. The obtained pharmacokinetic data shows an increase in C_{max} , T_{max} , AUC total, AUC0-n, $t_{1/2}$, MRT and decrease in Vd and CL in both normal and diabetic rats. In pharmacodynamic study group IV showed a decrease in serum glucose levels at all time points. There was a very significant ($p < 0.001$) influence in the percentage of glucose reduction in diabetic rats under multiple dose treatment but less significant ($p < 0.05$) influence in normal rats. Thus, the improved pharmacokinetic parameters of sitagliptin were more observed in the multiple dose treatment groups, and the improvement of pharmacodynamics was significant in only diabetic rats under multiple dose treatment. This may be due to the synergistic effect of curcumin and sitagliptin by inhibition of CYP3A4 in STZ induced diabetic rats. Hence sitagliptin dose may require special attention if used along with curcumin or herbal preparations containing curcumin to avoid complications.

Biography

Jyothi Penta completed her Ph.D in Pharmaceutical sciences from Kakatiya University. She completed masters and bachelors from Kakatiya University. Her research work was focused on herb-drug interaction studies based on pharmacokinetics and pharmacodynamics in rat models. Biochemical parameters and pk/pd modeling was done to estimate the interaction between anti diabetic drugs and Phyto chemicals.

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