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Toxicokinetics and tissue distribution studies of mercury in Ayurvedic preparation- Shila Sindhur

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Abstract

Shila Sindhur, an ayurvedic preparation intended for many ailments in Rasa Shastra of Ayurveda. This preparation composed of Mercury, Sulphur and Realgar, the composition persuaded us to study the toxicokinetics and tissue distribution of Mercury by assessing toxicokinetic parameters and tissue distribution studies with an aid of hematological, biochemical parameters and histopathological studies. The study was conducted by using three doses of Shila Sindhur doses i.e., 50mg/kg(low dose), 300mg/kg(medium dose), and 1000mg/kg (high dose). For toxicokinetic studies, these doses administered as single dose, and repeated doses model used for tissue distribution studies. These studies revealed that plasma clearance (CL) was extremely low with high half life (T 1/2), which correlates with the high plasma protein binding / affinity of Mercury. Higher amount of Mercury in blood stream shown by an increase in AUC and Vd with increasing doses. Mercury concentration found high in Kidneys followed by Liver, Lungs, Spleen and Brain. At high dose, Mercury concentration found 15 to 20 fold, in comparison to low dose. An alteration in biochemical parameters and histopathological studies provided evidence towards damage of Kidney and Liver, to a slighter extent to Lungs, Spleen and Brain. This damage was found intense in relative to the dose of drug. As a result, high dose of Mercury is not recommended for its toxic effects and a stringent monitoring recommended for use of moderate dose of Mercury. This study concludes that low single dose or repeated doses of Mercury found safe in terms of toxicological and distribution patterns.

Biography

Prof. Challa S. Reddy has been working as Principal and Head, at Vaagdevi College of Pharmacy, Warangal. He has completed his Doctoral degree from Kakatiya University College of Pharmaceutical Sciecnes. He has published more than 15 research papers in reputed journals and serving as an editorial board member of repute.