Abstract

Four widely used hepatoprotective agents namely silymarin, catechin, phyllanthin and lecithin were screened for their comparative efficacy in *in vitro* on Chang liver cell line and *in vivo* in Wistar rats against paracetamol, D-galactosamine and alcohol-induced toxicity. Silymarin was found to be most effective and formulated as diverse liposomal carrier systems namely conventional, PEGylated and charged liposomes (charged imparting agent Dicetyl phosphate and Stearyl amine). These liposomes were screened in *in vitro* on Chang liver cells against paracetamol, D-galactosamine and alcohol-induced toxicity. Conventional and PEGylated liposomal formulations showed better protection to Chang liver cells. Thus, these two formulations were selected for screening of *in vivo* hepatoprotection against the above-mentioned three hepatotoxins in Wistar rats. Conventional liposomes of silymarin showed better hepatoprotection, and better anti-inflammatory effects when compared to silymarin suspension in all three hepatotoxic models. The pharmacokinetic results from the oral administration of silymarin and its conventional liposomes showed that conventional liposomes increased Cmax more than five times compared to silymarin suspension in normal rats and almost six times in alcoholic liver disease condition in rat.