The aim of the present study was to elucidate the possible biochemical changes in lipid metabolism and organ function after treatment with sildenafil in normal and hyperlipidemic albino rats. Albino rats were grouped into seven groups (n=10/group) with blood sampling on days 30, 45 and 60 of the experiment for biochemical analysis. Group-i and -ii were fed on normal and cholesterol (1%) and fat (2%-enriched diets, respectively. Group-iii and -iv were fed on normal and cholesterol (1%) and fat (2%-enriched diets, respectively. Group-iii received sildenafil (5.625 mg/kg. wt., orally, daily) after 30 days from the start of the experiment. Group-v received same diet like group-ii and treated with sildenafil at the start of the experiment. Group-vi and -vii were fed same diet like group-ii but received atorvastatin (1.8 mg/kg b.wt, orally, daily) and ezetimibe (1 mg/kg b.wt.), respectively after 30 days from the start of the experiment. Sildenafil significantly decreased the serum lipid parameters in hyperlipidemic rats, but increased these values in negative control rats. Sildenafil caused a significant decrease in serum liver enzymes (ALT and AST), urea and creatinine in animals fed on fat- and cholesterol-enriched diet compared to the positive untreated ones. Concurrent administration of sildenafil with high fat and cholesterol diet (group-iv) failed to guard against the rise in liver and kidney function biomarkers. These data suggest that sildenafil may act as a mixed blessing drug; therefore it must be used carefully and under physician supervision to get its therapeutic benefits and guard against its adverse effects.

**KEY WORDS:** Cholesterol, Hyperlipidemia, Lipid, Rat, Sildenafil.