Monosodium glutamate, which is commonly used in processed foods as flavor enhancer, is considered ‘generally recognised as safe’ by FDA; however many studies have revealed the negative effects of MSG. We aimed to evaluate the effects of MSG in childhood on several serum parameters. Sixty-six rats, (4 weeks old) were divided into 3 groups as Control (CG, n = 22; 11 + 11, male+female), Experiment 1 (MSG-low dose, E1G, n = 22; 11 + 11, male+female) and Experiment 2 (MSG-high dose, E2G, n = 22; 11 + 11) groups. MSG was administered at 25 mg/kg/d to E1G, 2.5 g/kg/d to E2G for 6 weeks by oral gavage. The rats were sacrificed and blood samples were collected from aorta. The blood samples were centrifuged, the serum samples were separated and glucose, ALT, total protein, albumin, creatinine, cholesterol and triglyceride levels were analysed by Beckmann AU 5800 autoanalyser. Level of total protein was significantly increased in E1G and E2G groups when compared to CG (p < 0.05). Level of albumine was also increased in both EGs but significant difference was seen in E2G as compared to CG. Creatinine levels were significantly increased in EGs when compared to CG (p < 0.05). Although the glucose levels in both EGs were increased, the increase in E2G was statistically significant (p < 0.05). The ALT levels of in EGs were also increased but the significant increase was seen in E2G (p < 0.05). The effect of MSG seem to be dose dependent and especially effect on carbohydrate metabolism. Increasing doses caused increase in glucose level, and tendency to glucose intolerance. Increasing doses of MSG also caused increase in creatinine and urea. Another apparent effect of MSG was detected on ALT activity. In conclusion the negative effect of MSG on glucose level, liver and kidney functions depends on daily dose intake. Consumption of MSG seem to be inevitable it has to be restrained in children otherwise early metabolic problems may be future problems for these children.