OBJECTIVE: The aim of this study was to investigate the protective effects of aspirin (AS) and vitamin C (VC) against cardiac damage induced by chronic corn syrup (CS) consumption via a mechanism involving sirtuin-1 (ST-1), hypoxia-inducible factor-1? (HIF-1?), and the caspase-3 pathway in rats.

METHODS: Forty male Sprague-Dawley rats (14-16 weeks) that weighed 250-300 g were randomly distributed into 5 groups, each containing 8 rats: control group, CS+AS group, CS+VC group, CS+AS+VC group, and CS group. AS (10 mg/kg/day) and VC (200 mg/kg/day) were orally given to the rats. F30 (30% fructose syrup solution) was given to the rats in drinking water for 6 weeks. The rats were sacrificed by exsanguination 24 h after the last administration. Blood samples and tissue were collected for biochemical, histopathological, and immunohistochemical examinations. Non-parametric Kruskal-Wallis test and Mann-Whitney U test used for the parameters without normal distribution and ANOVA and post-hoc LSD tests were used for parameters with a normal distribution to compare groups.

RESULTS: Uric acid, creatine kinase (CKMB), and lactate dehydrogenase (LDH) levels were increased in the CS group compared with the control group (1.45±0.39 and p=0.011; 3225.64±598.25 and p=0.004; 3906.83±1064.22 and p=0.002, respectively) and decreased in all the treatment groups. In addition, increased levels of MDA and decreased activity of CAT in the CS group (0.172±0.03 and p=0.000; 0.070±0.005 and p=0.007, respectively) were reversed with AS and VC therapy. A decrease in ST-1 activity and increases in caspase-3 and HIF-1? activities corrected by VC and AS therapy were observed.

CONCLUSION: AS and VC, which display antioxidant and antiapoptotic activities, ameliorated cardiac damage induced by chronic fructose consumption by increasing the levels of ST-1 and decreasing the levels of HIF-1? and caspase-3.

PMID: 26645266 DOI: 10.5152/AnatolJCardiol.2015.6418