

Table 2 shows that TSO improved the L-NAME-induced changes in lipid profile, with lipid levels approaching those of the control group.

Table 2 Effects of TSO on serum lipid profile

Parameters (mg/dL)	Group A (Control)	Group B	Group C	Group D	Group E
TC	158.00±13.64	162.40±13.70	161.60±15.31	152.80±8.64 <sup>a,b</sup>	158.20±6.76
TG	58.80±9.47	62.80±8.80	58.80±4.15	79.40±14.27 <sup>a,b</sup>	62.80±9.01
HDL-C	42.60±5.94	35.80±6.38	39.84±5.81	49.40±4.22 <sup>a,b</sup>	45.80±6.57
LDL-C	132.40±13.94	140.00±17.73 <sup>a</sup>	130.00±13.93	122.80±12.54 <sup>a,b</sup>	129.80±13.04

Values are presented as mean ± SD (n = 8). A = Control; B = 40 mg/kg L-NAME; C = 40 mg/kg L-NAME + 0.45 mL/kg TSO; D = 40 mg/kg L-NAME + 0.6 mL/kg TSO; E = 40 mg/kg L-NAME + 2 mg/kg enalapril maleate. <sup>a</sup>P < 0.05 vs. A; <sup>b</sup>P < 0.05 vs. B

L-NAME induced marked changes in liver function indices, including elevations in AST, ALT, and ALP activities, whereas TSO treatment attenuated these effects (Table 3).

Table 3 Effects of TSO on serum liver enzyme activities

Parameters	Group A (Control)	Group B	Group C	Group D	Group E
AST (U/L)	156.20±1.30	259.20±2.59 <sup>a</sup>	168.20±1.79 <sup>b</sup>	165.00±1.58 <sup>b</sup>	161.40±1.14 <sup>b</sup>
ALT (U/L)	88.60±1.14	184.60±1.95 <sup>a</sup>	80.60±2.07 <sup>b</sup>	82.31±1.82 <sup>b</sup>	78.20±0.84 <sup>b</sup>
ALP (U/L)	175.20±5.89	266.52±6.89 <sup>a</sup>	184.00±7.07 <sup>b</sup>	182.00±10.61 <sup>b</sup>	165.60±7.57 <sup>a,b</sup>
TP (g/dL)	7.14±0.13	6.70±0.21 <sup>a</sup>	7.10±0.19	7.10±0.21	7.58±0.16
ALB (g/dL)	4.02±0.15	3.62±0.24	3.98±0.23	3.96±0.25	3.52±1.23 <sup>a</sup>
TB (mg/dL)	0.52±0.16	0.56±0.15	0.54±0.26	0.70±0.21 <sup>a,b</sup>	0.42±0.13 <sup>a,b</sup>
CB (mg/dL)	0.30±0.07	0.30±0.10	0.26±0.11	0.34±0.17	0.25±0.09

Values are expressed as mean ± SD (n = 8). A = Control; B = 40 mg/kg L-NAME; C = 40 mg/kg L-NAME + 0.45 mL/kg TSO; D = 40 mg/kg L-NAME + 0.6 mL/kg TSO; E = 40 mg/kg L-NAME + 2 mg/kg enalapril maleate. <sup>a</sup>P < 0.05 vs. A; <sup>b</sup>P < 0.05 vs. B

There was an increase in cardiac MDA levels and impairment of antioxidant defenses, as reflected by reductions in CAT, SOD, GPx, and GSH activities. TSO treatment mitigated these effects and improved cardiac antioxidant status (Table 4).

Table 4 TSO effects on heart MDA levels and antioxidant enzymes

Parameters	Group A (Control)	Group B	Group C	Group D	Group E
MDA (nmol/mg protein)	13.31 ± 5.13	26.11 ± 2.30 <sup>a</sup>	12.32 ± 5.21	12.62 ± 4.81	11.23 ± 1.37
CAT (U/mg protein)	60.18 ± 7.24	38.57 ± 8.25 <sup>a</sup>	49.80 ± 4.15 <sup>a,b</sup>	59.38 ± 38.16	64.12 ± 2.83
SOD (U/mg protein)	10.27 ± 2.62	4.42 ± 5.70 <sup>a</sup>	12.89 ± 0.94 <sup>b</sup>	10.26 ± 16.35 <sup>b</sup>	14.00 ± 1.24 <sup>b</sup>
GPx (U/mg protein)	20.31 ± 2.75	10.21 ± 8.02 <sup>a</sup>	18.16 ± 2.82 <sup>b</sup>	20.14 ± 13.36 <sup>b</sup>	22.46 ± 3.63 <sup>b</sup>
GSH (μmol/g protein)	7.71 ± 2.92	3.28 ± 4.39 <sup>a</sup>	6.87 ± 1.46 <sup>b</sup>	7.37 ± 1.29 <sup>b</sup>	7.11 ± 3.16 <sup>b</sup>

Values are expressed as mean ± SD (n = 8). A, Control; B, L-NAME (40 mg/kg); C, L-NAME + TSO (0.45 mL/kg); D, L-NAME + TSO (0.6 mL/kg); E, L-NAME + Enalapril Maleate (2 mg/kg). <sup>a</sup>P < 0.05 vs. A; <sup>b</sup>P < 0.05 vs. B

Similarly, Table 5 demonstrates that L-NAME administration caused oxidative imbalance in the liver, characterized by elevated MDA levels and altered antioxidant markers. TSO supplementation partially restored these changes toward normal levels.

Table 5 Effects of TSO on liver MDA and antioxidant enzymes

Parameters	Group A	Group B	Group C	Group D	Group E
MDA (nmol/mg protein)	10.13 ± 0.71	22.61 ± 4.43 <sup>a</sup>	13.32 ± 2.26	14.45 ± 5.11	12.21 ± 6.39 <sup>a,b</sup>
CAT (U/mg protein)	60.31 ± 5.11	30.42 ± 3.37 <sup>a</sup>	55.38 ± 6.28	58.82 ± 8.32	67.12 ± 4.53
SOD (U/mg protein)	13.72 ± 0.73	8.42 ± 1.14 <sup>a</sup>	10.62 ± 2.47 <sup>b</sup>	15.18 ± 3.42 <sup>b</sup>	12.00 ± 2.71 <sup>b</sup>
GPx (U/mg protein)	16.48 ± 7.01	9.43 ± 6.38 <sup>a</sup>	12.00±6.75 <sup>a,b</sup>	17.19 ± 2.76	19.56 ± 7.38
GSH (μmol/g protein)	5.84 ± 9.20	5.14 ± 0.12	8.50 ± 5.11 <sup>a,b</sup>	8.87 ± 7.45 <sup>a,b</sup>	7.85 ± 0.67 <sup>a,b</sup>

Values are expressed as mean ± SD (n = 8). A, Control; B, L-NAME (40 mg/kg); C, L-NAME + TSO (0.45 mL/kg); D, L-NAME + TSO (0.6 mL/kg); E, L-NAME + Enalapril Maleate (2 mg/kg). <sup>a</sup>P < 0.05 vs. A; <sup>b</sup>P < 0.05 vs. B