Aim: To examine the effects of melatonin treatment on lipid peroxidation (LPO) and the activities of antioxidant enzymes in the testicular tissue of streptozotocin (STZ)-induced diabetic rats. Methods: Twenty-six male rats were randomly divided into three groups as follows: group I, control, non-diabetic rats (n = 9); group II, STZ-induced, untreated diabetic rats (n = 8); group III, STZ-induced, melatonin-treated (dose of 10 mg/kg·day) diabetic rats (n = 9). Following 8-week melatonin treatment, all rats were anaesthetized and then were killed to remove testes from the scrotum. Results: As compared to group I, in rat testicular tissues of group II, increased levels of malondialdehyde (MDA) (P < 0.01) and superoxide dismutase (SOD) (P < 0.01) as well as decreased levels of catalase (CAT) (P < 0.01) and glutathione peroxidase (GSH-Px) (P > 0.05) were found. In contrast, as compared to group II, in rat testicular tissues of group III, levels of MDA decreased (but this decrease was not significant, P > 0.05) and SOD (P < 0.01) as well as CAT (P < 0.05) increased. GSH-Px was not influenced by any of the treatment. Melatonin did not significantly affect the elevated glucose concentration of diabetic group. At the end of the study, there was no significant difference between the melatonin-treated group and the untreated group by means of body and testicular weight. Conclusion: Diabetes mellitus increases oxidative stress and melatonin inhibits lipid peroxidation and might regulate the activities of antioxidant enzymes of diabetic rat testes.