OBJECTIVE:

In living organisms, there is a balance between the oxidant and antioxidant systems. Reactive products continuously formed by exogenous and endogenous sources are rendered harmless by the antioxidant system. Oxidative stress is an etiological factor in aging and the development of various diseases. In the present study, the aim was to investigate the effects of meal frequency and calorie restriction on oxidant-antioxidant systems in rat serum and tissue.

METHODS:

Nine adult male Wistar Albino rats were used for the pilot study, and another 24 adult male Wistar Albino rats, also weighing 200 to 250 g each, were included in the main study. The rats were divided into 3 groups based on nutrition: the ad libitum group (AL) (n=8), the 2-meal group (TM) (n=8), and the 2-meal with calorie restriction group (TM-CR) (n=8). Following the 4-week pilot study, nutrition regulation was performed in all groups for 20 weeks, 7 days a week, with 60 minutes allotted per meal. Serum and tissues of rats were isolated at the end of the experiment. Total antioxidant status (TAS) and total oxidant status (TOS) were determined using the Erel method. Oxidative stress index (OSI) was calculated using the formula OSI = TOS/TAS. Liver tissue was examined histopathologically. Statistical analyses were performed using the IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp., Armonk, NY, USA) program.

RESULTS:

There were significant differences between the AL and TM, and the AL and TM-CR groups in adipose tissue TOS and OSI, and between the AL and TM groups in the liver TAS of the rats (p<0.05).

CONCLUSION:

Calorie restriction and sparse meal frequency can increase the activity of antioxidants and can reduce oxidative stress. Thus, many diseases caused by oxidative stress may be prevented with the correct regulation of feeding.