Aim: The aim of the present study is to investigate the effects of CS and simultaneous application of resveratrol on bone healing histomorphometrically and to evaluate the effects of resveratrol on negative effects of CS. Materials and Methods: During 4 weeks, Sprague–Dawley rats exposure to cigarette smoke was equivalent to 6 cigarettes per day. After this period, monocortical defects were opened in femurs by a trephine bur on day-28. Starting from the day of defect creation to the 28th postoperative day, rats were given 20 mg/kg body weight resveratrol. Histomorphometric examination of the number of osteoblasts and osteoclasts, as well as new bone area, was conducted. Results: Investigations were carried out on 33 rats. Differences between osteoblast numbers in control and smoking groups were significant, and cigarette smoking caused a reduction in the number of osteoblasts. Areas of new bone formation in resveratrol and control groups were higher than in the smoking and smoking+resveratrol groups. Conclusion: Smoking appeared to have adverse effects upon bone healing and resveratrol administration helped to reduce these effects.

Key Words: Cigarette Smoking, Resveratrol, New bone area, Osteoblast, Osteoclast