**Background:** In the periodontal pathogenesis, interleukin (IL)-1β, IL-4, IL-6 and tumor necrosis factor (TNF)-α are considered to be key cytokines. The adipocytes produce and increase the levels of some circulating cytokines in addition to the adipokines. The aim of this study is to investigate the role of cytokines (IL-1β, IL-4, IL-6 and TNF-α) and adipokines (leptin, adiponectin, resistin) in the possible relationship between periodontitis and obesity.

**Materials and Methods:** Study groups were constituted as normal-weight periodontally healthy (NH), normal weight periodontitis (NP), obese periodontally healthy (OH), and obese periodontitis (OP). Periodontitis was induced by ligature in 14 days. After sacrifice, cytokine and adipokine levels in serum samples were determined by ELISA.

**Results:** NH and NP groups have higher IL-4 levels than the obese rats (P<0.0125). The IL-6 levels were significantly higher in the NP, OH and OP groups than NH group (P<0.0125). Additionally, the IL-6 level was significantly higher in the OP group than the NP group (P<0.0125). Adiponectin was found significantly higher in the NH group than the OH and OP groups, while leptin and resistin levels have not presented any significant differences between the groups (P>0.0125).

**Conclusions:** Within the limitations of the study and the experimental obesity and periodontitis models used, it might be concluded that the key cytokines were affected by obesity rather than periodontitis, obesity has resulted in increased pro-inflammatory (IL-6) and decreased anti-inflammatory (adiponectin) adipokine levels. Further studies are needed to investigate the risk to develop atherosclerosis in obesity with the presence of periodontitis.