Role of soluble interleukin-6 receptor in inflamed gingiva for binding of interleukin-6 to gingival fibroblasts.

周幸華
Naruishi K;Takashiba S;Chou HH;Arai H;Nishimura F;Murayama Y.

Abstract

Interleukin-6 (IL-6), frequently detected in periodontitis, is known to mediate important signals in the inflammatory cytokine network. Gingival fibroblasts (GF) secrete cytokines upon stimulation with inflammatory mediators. However, it is not clear if GF respond to IL-6. We examined the IL-6 receptor gene expression in GF. Furthermore, we tested whether GF are target cells for IL-6 by examination of binding of IL-6. GF were found to contain trace amounts of mRNA for IL-6 receptor (IL-6R), but had high levels of mRNA for 130-kDa glycoprotein (gp130), which is a signal transducer for IL-6/IL-6R complex. Based on this observation, we hypothesized that IL-6 could bind GF if exogenous soluble forms of IL-6R (sIL-6R) existed in the gingiva or culture condition. Thus, we investigated the existence of sIL-6R in gingiva using enzyme-linked immunosorbent assay and whether sIL-6R influenced the binding of IL-6 to GF in vitro. In inflamed gingiva, sIL-6R was detected and its concentration ranged from 150 to 700 pg/microgram protein. The sIL-6R enhanced the binding of IL-6 to GF in a dose-dependent manner. This enhancement was inhibited by an antibody against gp130, suggesting that the IL-6/sIL-6R complex bound to the fibroblasts via gp130. These data demonstrated that gingival fibroblasts can be target cells for IL-6 in the presence of appropriate amounts of sIL-6R. This situation may exist during inflammation in periodontal tissue.