Effect of estrogen on bone resorption and inflammation in the temporomandibular joint cellular elements

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Abstract

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Several epidemiological studies have reported that temporomandibular disorder is more prevalent in women, which suggests the involvement of sex hormones, such as estrogen, in the pathogenesis of this disease. PCR amplification and Western blotting were employed to target the expression of estrogen receptors (ERs) in human fibroblast-like synovial and ATDC5 cells. The effect of estrogen was investigated through the expression of RANKL, osteoprotegerin (OPG), M-CSF/CSF-1 and c-fms. We showed expression of M-CSF/ CSF-1 and c-fms, with time-dependent increase in both after the addition of estrogen. Based on previous studies reporting that M-CSF/CSF-1 regulates the proliferation and differentiation of hemopoietic progenitor cells into mature macrophages, we put forward a new hypothesis based on the increased inflammation and tendency of females to suffer more from temporomandibular disorder (TMD) in the presence of external exacerbating factors. Detection of RANKL and OPG in ATDC5 and expression of both in HFLS was confirmed with complete disappearance of the RANKL band, and marked increase in the expression of OPG after 1 h from the addition of estrogen.

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