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Original article

Mesenchymal Stem Cells from Periapical Lesions Upregulate the Production of Immunoregulatory Cytokines by Inflammatory Cells in Culture

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SUMMARY

The pathophysiology of periapical lesions (PLs) is under control of pro-inflammatory and anti-inflammatory (mainly immunoregulatory) cytokines. We have recently established mesenchymal stem cells (MSCs) from PLs and showed their suppressive effects on the production of pro-inflammatory cytokines from PLs inflammatory cells (ICs). In this work we studied the production of interleukin (IL)-10, IL-27 and transforming growth factor (TGF)-β, by PL-ICs in direct or indirect contacts with PL-MSCs. PL-ICs, which were isolated from four different asymptomatic PLs, predominantly composed of lymphocytes, followed by neutrophil granulocytes, macrophages and plasma cells. PL-MSCs, expressing typical MSC markers, were co-cultivated with PL-ICs at 1:10 ratio, either in direct contact or in a transwell-system, for 24 hours. The levels of cytokines in cell-culture supernatants were tested by ELISA. The results showed that PL-MSCs up-regulated the production of all three immunoregulatory cytokines by PL-ICs. PL-MSCs stimulated the production of IL-10 and IL-27 via soluble factors, whereas the up-regulation of TGF-β required direct cell-to-cell contacts. In conclusion, our results showed for the first time the involvement of PL-MSCs in restriction of inflammation in PLs by up-regulation of immunoregulatory cytokines.

Key words: **periapical lesions, mesenchymal stem cells, inflammatory cells, immunoregulatory cytokines, culture**

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