

Immunological and ultrastructural characterization of plasma cells of human periapical chronic inflammatory lesions (granulomas)

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SUMMARY

Despite many studies on the topic, plasma cells found in human periapical chronic inflammatory lesions (granulomas) continue to present unresolved issues. In this study, we tried to assess quantitatively and qualitatively the nature of plasma cells of 4 human periapical granulomas. Samples were analyzed for relative amounts of IgG-, IgM-, IgA-, and IgE-positive plasma cells by immunohistochemistry, and for morphological changes by transmission electron microscopy (TEM). By immunohistochemistry, many plasma cells stained positively with anti-IgG and anti-IgM antibodies; fewer cells reacted with anti-IgE and anti-IgA. Russell Bodies, controversial aspects of plasma cell maturation, showed positive reactivity of the superficial layer only to antibodies against IgG and IgM. By TEM analysis, phenotypes of normal and dysfunctional plasma cells (Mott cells) were evident. Russell Bodies appeared as intra- or extracellular round vesicles, with an homogeneous internal core, and an external membrane, resembling rough endoplasmatic reticulum (RER). We can conclude that mucosal immune response is not the predominant type in the periapical lesions examined. Positive immunoreaction for IgG and IgM of Russell Bodies may be due to the residual RER membrane, whereas components of yet unidentified nature may occupy the internal core.

INTRODUCTION

Bacterial infections of the tooth pulp result in inflammation, followed by spread of bacteria and toxic products outside the root canal (Pitts et al., 1982). In the periapical area, bacterial components stimulate inflammatory and immunogenic response, which involves migration and proliferation of cells derived from mononuclear phagocytes, T- and B-lymphocytes, fibroblasts and leukocytes (Garrett et al., 1984). The histological remodelling of the periapical area (granuloma) results from bone resorption, infiltration of loosely packed collagen fibers, neoangiogenesis, and