Immunohistochemical and tracer studies of macrophages/microglia in the pineal gland of postnatal rats

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摘要

Abstract

The pineal gland of rats of various ages (1-21 days old) was examined by immunohistochemistry and electron microscopy. Numerous widely distributed cells identified as macrophages/microglia were immunoreactive with the monoclonal antibodies OX-42, OX-18, OX-6, and ED1, indicating that they expressed complement type 3 (CR3) receptors, major histocompatibility complex class I and II antigens, and antigens of monocyte/macrophage lineage as detected by the antibodies, respectively. Following an intraperitoneal injection of rhodamine isothiocyanate (RhIC) in all age groups, the cells emitted a bright fluorescence. They were also labeled by horseradish peroxidase (HRP), as demonstrated in both light and electron microscopy. An HRP reaction was observed in vesicles and lysosomes at the ultrastructural level. A remarkable feature was the uptake of these tracers by pinealocytes. In light microscopy, the pinealocytes showed a punctate reaction product 3-24 hours after HRP injection. By electron microscopy, the reaction product was observed in vesicles, lysosomes, and some rod-like structures in the cytoplasm. On the basis of their immunophenotypic features, it is suggested that the macrophages/microglia in the pineal gland are active phagocytes which are also probably involved in the immunoregulatory function in the gland. The avid uptake of RhIC and HRP from the circulation by these cells suggests that serum-derived substances that may gain access to the parenchyma of the gland are being constantly monitored. The labeling of pinealocytes with HRP suggests that the functional activities of these cells are being modulated by serum-derived substances.