

Effects of streptozotocin-induced diabetes on taste buds in rat vallate papillae

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摘要

Abstract

Some studies have documented taste changes in patients with diabetes mellitus (DM). In order to understand the relationships between taste disorders caused by DM and the innervation and morphologic changes in the taste buds, we studied the vallate papillae and their taste buds in rats with DM. DM was induced in these rats with streptozotocin (STZ), which causes the death of beta cells of the pancreas. The rats were sacrificed and the vallate papillae were dissected for morphometric and quantitative immunohistochemical analyses. The innervations of the vallate papillae and taste buds in diabetic and control rats were detected using immunohistochemistry employing antibodies directed against protein gene product 9.5 (PGP 9.5) and calcitonin gene-related peptide (CGRP). The results showed that PGP 9.5- and CGRP-immunoreactive nerve fibers in the trench wall of diabetic vallate papillae, as well as taste cells in the taste buds, gradually decreased both intragemmally and intergemmally. The morphometry revealed no significant difference in papilla size between the control and diabetic groups, but there were fewer taste buds per papilla (per animal). The quantification of innervation in taste buds of the diabetic rats supported the visual assessment of immunohistochemical labeling, that the innervation of taste cells was significantly reduced in diabetic animals. These findings suggest that taste impairment in diabetic subjects may be caused by neuropathy defects and/or morphological changes in the taste buds.