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Diabetes induces changes in salivary gland melatonin reactivity

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The fine localization of melatonin and its receptors in the human salivary glands were reported in our previous works revealing, by transmission electron microscopy (TEM), that serous cells are able to store melatonin and to secrete it by regulated pathways (1, 2). Moreover, changing in morphology during secretion was observed after melatonin treatment by high resolution scanning electron microscopy (3). As in saliva of patients suffering from type 2 diabetes melatonin was reduced, we focused our study on salivary glands removed from diabetic subjects, in order to add diabetic data to our survey on melatonin and salivary glands. Aim of this investigation was to establish if diabetic status may affect subcellular melatonin distribution and traffic. Bioptic samples of parotid and submandibular glands, removed from diabetic patients, were fixed, dehydrated, embedded in Epon Resin and processed to search for melatonin reactivity by the immunogold staining method. The labelling density (expressed as number of gold particles per μm2/granule) and the percentage of melatonin-positive granules were estimated in diabetic samples. The resulting values were compared with those of non-diabetic ones and the differences were statistically evaluated. In diabetic samples the pattern of melatonin staining was unchanged with respect to non-diabetic ones, as the gold particles were specifically localized within secretory granules and vesicles of serous cells. The quantitative evaluation of gold particles showed that the labeling density changed in parotid diabetic samples with respect to those measured in non-diabetics, as the percentage of melatonin positive granules showed a tendency to decrease in the diabetic status in both glands.

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Keywords

Melatonin; salivary gland; diabetes; immunogold method.