

MORPHOLOGICAL AND FUNCTIONAL CHANGES IN RATS INCISOR TRIGGERED BY CHRONIC EXPOSURE TO FLUORIDE

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It is well known that excessive intake of fluoride (F-) during dentinogenesis causes dental fluorosis. However the molecular mechanism underlying fluorosis remains unclear. Connexins (Cxs) are important to control growth and cell differentiation of dental tissues. The aim of the present study was to assess the impact of chronic exposure of F- on Cxs expression in dental pulp, and on morphometric parameters of adult rat mandible and incisors. Three groups of male Wistar rats (22 days-old) were given water containing: a) 0.3 mg/L (Control), b) 10 mg/L and c) 50 mg/L of NaF for eight weeks. Incisor pulp homogenates were prepared for determination of Cx32, Cx43 and Cx45 gene expression, using semi-quantitative RT-PCR, and of ALP activity. Morphometric parameters of mandible and incisors were determined on radiographs. Histomorphometric parameters were evaluated with Image Pro Plus 6.1 software. Results were analyzed by ANOVA and Bonferroni's test. Expression of Cx43 increased with exposure to F- in a dose-dependent manner. Cx32 mRNA levels were higher than controls in the 10 mg/L NaF group only; Cx45 mRNA levels were lower in groups given 10 and 50 mg/L of NaF than in controls. ALP activity was higher in both high-NaF dose groups compared to the control group ($p < 0.05$). Lower incisor diameter was lower in the 50 mg/L NaF than in the control group ($p < 0.01$). None of the mandibular growth or histomorphometric parameters were affected by NaF treatment. In conclusion, fluorotic alterations in rat incisor were associated with differential expression of Cxs and ALP activity in pulp tissue. The observed changes may have a stimulating effect on dentin mineralization.

Keywords: fluoride - dental pulp – odontoblasts - connexins