FLUORIDE INCREASES MANDIBULAR BONE VOLUME AND THE NUMBER OF OSTEOBLASTS DURING PRE-ERUPTIVE STAGE

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Low fluoride (F^-) doses stimulate osteoblasts differentiation and promote organic matrix synthesis. There is not much information about the effects of fluoride exposure during fetal and early post-natal period on the properties of the mandibular bone. OBJECTIVE: To study the effect triggered by fluoride exposition during gestation and lactation period, on the early bone modeling of offspring jaws. METHODS: Rat offspring of 10- and 15-days-old from two groups of mothers which drank water with different F^- concentrations in form of sodium fluoride (NaF) were used: Controls (0,3 mg F-/L) and Treated (22,6 mg F-/L). Treatment was performed thirty days previous mating, during gestation and lactation. Animals were euthanized by cervical dislocation. Plasmatic calcium (Ca) and alkaline phosphatase (FAL) concentration were determined by the use of commercial kits. Complete jaws were extracted, histologically processed and stained with H&E. On digital microphotographs of serial buccolingual sections, at the level of first molar, different histomorphometric parameters in the basal zone were analyzed: Trabecular bone volume [BV/TV (%)], osteoblasts number per trabecular perimeter (N.Ob/mm) and osteocytes number per trabecular area (N.Ot/mm^2). Results were analyzed with Student "t" test, considering significant differences at $p<0,05$. RESULTS: Total plasmatic levels of Ca and FAL increased in 10-days-old pups from mothers treated with F^- ($p<0,05$), at 15-days-old FAL activity stayed increased in the treated group ($p<0,05$). Histomorphometric analysis in the mandibular basal zone showed an increase in BV/TV (%) of pups exposed to F^- at 10- and 15-days-old pups ($p<0,01$); this increase was associated to a higher N.Ob/mm ($p<0,01$). F^- exposure produced an increase in the N.Ot/mm^2 only at 15-days-old ($p<0,05$). CONCLUSION: The results suggest that this way of F^- administration to the organism during the early period of bone formation, stimulates the process of mandibular bone formation mediated by the increase in the number of osteoblasts and osteocytes.

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