

Effects of Alpha Lipoic Acid on Limb Lengths in Neonatal Rats Exposed to Maternal Tobacco Smoke

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Abstract : Maternal tobacco smoke exposure is known to cause growth retardation in the neonatal skeletal system. Alpha lipoic acid, a natural antioxidant found in some foods, limits the activities of osteoclasts and supports the osteoblast's bone formation mechanism. In this study, it was aimed to investigate the effects of alpha lipoic acid (ALA) on the height, long bones and tail lengths of pups exposed to maternal tobacco smoke. The rats were divided into four groups: 1) control group, 2) tobacco smoke group, 3) tobacco smoke + ALA group, and 4) ALA group. Rats in the group 2 (tobacco smoke), group 3 (tobacco smoke + ALA) were exposed to tobacco smoke twice a day for one hour starting from eight weeks before mating and during pregnancy. In addition to tobacco smoke, 20 mg/kg of alpha lipoic acid was administered via oral gavage to the rats in the group 3 (tobacco smoke + ALA). Only alpha lipoic acid was administered to the rats in the group 4. On day 21 postpartum, the height and tail lengths of the pups in all groups were measured, and the length of the extremity long bones was measured after decapitation. All morphometric measurements performed in group 2 (tobacco smoke) showed a significant decrease compared to group 1 (control), while all measurements in group 3 (tobacco smoke + ALA) showed a significant increase compared to group 2 (tobacco smoke). It has been shown that ALA has a protective effect against the regression of height, long bones and tail lengths of pups exposed to maternal tobacco smoke.

Keywords : alpha lipoic acid, bone, morphometry, rat, tobacco smoke

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