

Physiological study on the increased sodium chloride preference observed soon after the zinc-deficient diet feeding to SD rats.

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It has been generally known that zinc-deficiency causes taste abnormality, but its effect on salt preference has not yet thoroughly been clarified especially at an earlier stage of zinc deficiency. Until now we have found out that the feeding of zinc-deficient diet causes an abrupt increase of sodium chloride preference even after 3 to 4 days of the diet feeding. Therefore, the present study was undertaken to clarify the mechanism of the increased salt preference observed in the zinc-deficient rats at an earlier stage of the zinc-deficiency.

Male, 4 weeks-old SD rats were used for the present study. The zinc-deficient (2.2 ppm Zn in the diet), low-zinc (4.1 ppm), zinc-sufficient (33.7 ppm) diets were fed with free access, and the pair-fed control group was set against the zinc-deficient group with zinc-sufficient diet. Five rats of each group were reared together in a big wire-meshed stain-less cage, and the 2 kinds of preference tests with 2-bottle system ([1] 154 mM NaCl soln and water, and [2] 0.01 mM Quinine-HCl soln and water) were undertaken from the initial stage to the severe stage of the zinc-deficiency. The taste nerve sensitivity was recorded at 0, 4th, and 42nd day of the feeding period. The consumption of drinking water and urinary salt excretion were measured daily throughout the experiment.

It was clearly confirmed that the increase of salt preference in the rats fed zinc-deficient or low-zinc diets was abruptly observed after 4 days of the feeding. At an earlier stage of the feeding period, there was no increase of urine volume, water consumption, and deterioration of taste nerve sensitivity to sodium chloride and quinine-HCl that were seen in the severe zinc-deficiency. The present result indicates that dietary signal of zinc-deficiency itself may reflect salt preference probably through central nervous system or through mineral status in the organs such as bone or liver, though further studies are necessary to prove it.