

No.9026 Behavioral and Physiological aspects of spontaneous salt intake in mice exposed to various environmental conditions.

Tsuguyoshi Suzuki¹, Hiroshi Kashiwazaki¹ & Yasushi Dejima²

1. *Department of Human Ecology, School of Health Sciences, Faculty of Medicine, The University of Tokyo.*

2. *Department of Human Ecology, School of Health Sciences, Faculty of Health Sciences, Kyorin University.*

Summary

Spontaneous salt intake of male mice of ICR strain was investigated in the two different experimental conditions. In both of the experiments, animals were housed individually in polycarbonate cage; two water-supply bottles were set on each cage, and animals could choose a bottle to drink freely. In Experiment 1, five-week old mice were given zinc adequate diet (Zn: 50 μ g/g) and distilled water (Group ZnA), or zinc deficient diet (Zn: 2 μ g/g) and distilled water (Group ZnD2) for 8 weeks. Growth, zinc levels in various tissues, and in plasma, hepatic metallothionein (MT) contents, and plasma alkaline phosphatase (ALP) activity were measured at the end of 6 weeks and 8 weeks. Taste threshold for NaCl solution and Preference for 0.9% and 1.6% NaCl solution was investigated at 4-6 weeks and 6-8 weeks. Growth of mice was not significantly different between in Group ZnA and in Group ZnD2 throughout the experiment. ALP activity in plasma, and zinc levels in plasma and femur in the Group ZnD2 was significantly lower than those in Group ZnA both at the end of 6 weeks and 8 weeks. Hepatic MT content was significantly lower in Group ZnD2 than in Group ZnA only at the end of 8 weeks. Zinc levels in brain, kidney, liver and red blood cell were not significantly different between the two groups both at the end of 6 and 8 weeks. Thus, marginal zinc deficiency was successfully produced in Group ZnD2. Salt taste threshold in Group ZnA was 0.05%, although, it was shifted to 1.0% both at the end of 6 and 8 weeks in Group ZnD2. Preference for 0.9% NaCl solution was the same in both of two groups (about 40%). However, preference for 1.6% NaCl solution was significantly higher in Group ZnD2 than in Group ZnA both at the end of 6 and 8 weeks. In Experiment 2, 10-week old mice were subcutaneously injected 0, 30 or 40 μ M/kg of sodium-selenite (SS) dissolved in PBS. Hereafter, we call those group of mice as PBS, SS30, and SS40 respectively. Colonic temperatures at 1, 2, 4, 6, 8 hours after injection were measured. Food intake and preference for 0.9% NaCl solution in 24 hours after injection were measured. Colonic temperature of mice in SS40 was significantly lower than in PBS during 6 hours after injection. Colonic temperature in SS30 was significantly lower than in PBS during 2 hours after injection. Preference for 0.9% NaCl solution was significantly higher in SS40 (78.4%) than in PBS (31.2%), while it was the same between in SS30 (48.2%) and in PBS. Food intake of mice in SS40 was significantly lower than in PBS, while it was the same between in SS30 and in PBS.