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Effect of Salt Intake on Cold-Induced Body Temperature Decrease

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Summary

Salt intake in humans is known to vary depending on the area, and cold regions consume more salt than in warm climate regions. Also in mice, cold stimulation has been reported to increase salt intake, suggesting that cold may be the cause of increased salt intake. However, the mechanism by which salt intake increases due to cold, and the effect of excess salt intake is not well understood. This study, we focused on heat production and aimed to clarify the effect of salt on the decrease in body temperature due to cold. The mice were divided into Control group and NaCl group. Distilled water was given to the Control group and 0.9% NaCl water to the NaCl group with free drinking water. The mice were applied with 6 hours of cold stimulation (5 ° C.) for 6 days. As a result, a decrease in rectal temperature was observed in both groups due to cold stimulation. However, the decrease in rectal temperature was significantly suppressed in the NaCl group compared to the Control group. There was no significant difference in the expression of thermogenesis-related genes and brown fat markers in brown adipose tissue. In addition, the expression level of lipid metabolism related genes did not change, but the expression of glucose metabolism related genes showed a significant increase due to the increase in salt intake. The expression of genes associated with thermogenesis, mitochondrial biogenesis, glucose and lipid metabolism in subcutaneous adipose tissue and skeletal muscle did not change with increasing salt intake. From the above results, it has been suggested that the increase in salt intake has the effect of suppressing the decrease in body temperature under cold conditions. In addition, it has been suggested that this action may be related to the enhancement of brown adipose tissue glucose metabolism. In the future, we plan to analyze by focusing on sugar metabolism of brown adipose tissue.