

Electrophysiological study on pharyngolaryngeal mechanisms for vasopressin release

Akaishi, T. and Homma, S.

*Department of Physiology, Niigata University School of Medicine,
Asahimachi-dori 1, Niigata 951, JAPAN*

Summary

The role of the pharynx and larynx in body water regulation was studied in urethane-anesthetized (1.2 g/kg, b.wt.) rat by recording the electrical activities of hypothalamic vasopressin (AVP) producing cells. Pharyngeal/laryngeal application of 0.15 ml/kg b.wt. water made a decrease in AVP cell activity, whereas the same volume of 0.3M saline made a reverse response, an increase in firing activity. Isotonic saline had no effect. In next step of this study, to eliminate the gustatory effects of sodium ions, 0.05 mM amiloride which is known to block sodium transport at cell membrane, was used as a solvent of sodium chloride. Application of 0.05 mM amiloride caused a significant ($P < 0.05$) decrease in firing activity. Hypertonic saline (0.30 M) in amiloride interestingly caused insignificant change in their activity, namely evoked response was inhibited partially but not entirely. Isotonic saline in amiloride had no effect.

These data suggest that afferent pathways from pharyngeal and laryngeal mucosa regulate the AVP release in association with the concentration of sodium chloride involved in the solution ingested, and that the gustatory factor for sodium reception is involved in this mechanism.