

The effect of salt intake on the defensive strategies against inescapable innate fear and fear stress-associated learned despair in mice

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A component of fox faces, 2,4,5-trimethylthiazoline (TMT) induced innate fear of mice produced active escape behaviors in inescapable box is followed by freezing as passive escape behavior. The duration of active escape behavior is regulated by the neurons releasing the corticotropin-releasing hormone from the paraventricular nucleus of hypothalamus to the bed nucleus of the stria terminalis. Recently we found that the 2% salt intake for 5 days decreased the duration of TMT-induced active escape behaviors and increased the duration of freezing time in inescapable acrylic box (30 cm³). Against our expectation, the mice with 2% salt intake exhibiting shorter duration of active escape behaviors delayed the induction of learned despair during tail suspension test (TST) and decrease in the duration of the immobility time during TST, because the paradigm of innate fear-induced inescapable behaviors from active to passive coping strategies is similar with that of TST. Excessive daily salt intake is the risk for the high blood pressure, myocardial infarction and stomach cancer etc. In the present study, we suggest that the tasting the adequate amount of salt, but not excessive, may decide the coping style to adapt the psychological stresses and benefit for preventing the despair behavior as enhancing the resilience against daily stresses.