Desipramine Prevents the Sustained Increase in Corticotropin-Releasing Hormone-Like Immunoreactivity Induced by Repeated Immobilization Stress in the Rat Central Extended Amygdala

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Abstract

Clinical and experimental studies have shown that the activation of corticotropin-releasing hormone (CRH) and noradrenergic systems mediate stress-induced anxiety. Repeated immobilization stress (RIS) has been shown to induce long-lasting anxiety behavior and changes in noradrenaline turn-over. The present work was aimed at studying the effect of RIS on the in situ expression of CRH-LI in the central extended amygdala and paraventricular nucleus of the hypothalamus (PVN). Our results showed that RIS for 15 days induces a significant increase of CRH-LI expression in the central extended amygdala. The increase in CRH-LI expression in the central extended amygdala was sustained even after a 25-day stress-free period. The concomitant administration of desipramine (DMI), a specific noradrenaline uptake inhibitor, fully prevented the RIS-induced increase in CRH expression. RIS also induced an increase of CRH-LI expression in the PVN that was prevented by the concomitant DMI administration. In contrast to the sustained effect observed in the central extended amygdala, the RIS-induced increase of CRH-LI expression in the PVN was nonlasting. DMI administration also prevented the RIS-induced increase of adrenal gland weight. The present findings showing that RIS induces a sustained increase of CRH expression in the central extended amygdala suggest that the repeated activation of CRH neurons and CRH receptors in the central extended amygdala may underlie the long-lasting anxiety behavior induced by RIS. Further studies should address the mechanisms involved in the effect of DMI and its eventual relevance in the therapeutic actions of DMI.

Key words: lateral bed nucleus of the stria terminalis; central nucleus of the amygdala; paraventricular nucleus of the hypothalamus; anxiety