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Social isolation modulates corticotropin-releasing factor type 2 receptor, urocortin 1 and urocortin 2 mRNAs expression in the cardiovascular system of prairie voles.

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Abstract

The purpose of the present study was to examine the effect of social isolation stress on the expression of messengers ribonucleic acid (mRNAs) for corticotropin-releasing factor receptor type 2 (CRF2 receptor), urocortin 1 (Ucn 1) and urocortin 2 (Ucn 2) in the cardiovascular system of female and male prairie voles (Microtus ochrogaster). Isolation for 1 h (single isolation) or 1 h of isolation every day for 4 weeks (repeated isolation) was followed by a marked increase in plasma corticosterone level. However, continuous isolation for 4 weeks (chronic isolation) did not significantly affect plasma corticosterone level in female or male animals. A single period of isolation did not influence the expression of the CRF2 receptor, however, both repeated and chronic isolation significantly decreased CRF2 receptor mRNA in the ventricle and aorta of both sexes. Neither single nor chronic isolation significantly affected Ucn 1 mRNAs expression; however, repeated isolation increased Ucn 1 mRNA expression in the ventricles of female and male animals. Although, a single isolation produced no effect on cardiac Ucn 2 mRNA expression, both repeated and chronic isolation were followed by increased heart Ucn 2 mRNA expression in both sexes. We speculate that during repeated isolation Ucn 1 along with Ucn 2 are increased, which in turn down-regulates CRF2 receptor mRNA expression, and that Ucn 2 also may be one of factors responsible for the down-regulation of CRF2 receptor mRNA expression in cardiovascular system that is associated with chronic isolation.

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