Beta-Adrenergic Blockade Decreases the Neuroimmune Changes in Mice Induced by Cohabitation with an Ehrlich Tumor-Bearing Cage Mate

Abstract
Objectives: Cohabitation with Ehrlich tumor-bearing (ETB) mice induced behavioral, neurochemical, hormonal, and immune effects in the conspecifics as a consequence of stress-induced activation of the sympathetic nervous system (SNS) with catecholamine release. In the current study, the nonspecific beta-AR blocker d, l-propranolol and the specific beta(2)-AR blocker ICI-118.551 were employed as pharmacological tools to assess the extent to which catecholamines participated in the effects induced by cohabitation with ETB mice.
Methods: Two experiments were performed, 1 with d, l-propranolol treatment and the other with ICI-118.551. One mouse in the experimental group was called the "companion of the sick partner" (CSP) since it was forced to live in the same cage with 2 (experiment 1) or 1 (experiment 2) cage mate that had been i.p. injected with 5 x 10(6) Ehrlich tumor cells. Results: The d, l-propranolol treatment, but not the ICI-118.551 treatment, attenuated the effects of cohabitation with 2 ETB mice on both open-field behavior and the hypothalamic levels and turnover rate of norepinephrine. The 2 beta-AR blockers were unable to change the serum corticosterone levels and adrenal weights of the CSP mice; however, these drugs abrogated the effects of cohabitation on neutrophil oxidative burst and phagocytosis. Finally, an increase in the 5-HT turnover rate was observed in the olfactory bulb of CSP mice compared to their respective controls, an effect that was not modified by beta-AR blockade. Conclusion: These results confirm and strengthen our hypothesis that the SNS is involved in the effects induced by cohabitation with ETB mice and point towards beta(2)-AR participation in the immune effects analyzed. (C) 2017 S. Karger AG, Basel (AU)