Title
NEUROENDOCRINE EFFECTS OF CHRONIC STRESS - ABNORMAL HORMONAL STRESS-RESPONSE IN AN INFANT RAT MODEL

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93. Neuroendocrine Effects of Chronic Stress: Abnormal Hormonal Stress Response in an Infant Rat Model

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Elucidating the neurobehavioral effects of chronic neglect in the young child has significant clinical implications. We previously reported preliminary results of a novel handling/bedding paradigm of chronic stress in the infant rat [1]. We now report on specific alterations in the regulation of plasma corticosteroids using this paradigm. Rat pups (n = 136) were assigned to 3 treatment groups on postnatal day (PND) 2: H, handled daily for 15 minutes; NH, not handled but permitted access to bedding; and NHNB, not handled with no access to bedding. Cold-separation challenge (CSC) was performed on PND 9, as previously described [2]. Basal plasma corticosterone (CORT) tended to be higher in NHNB than NH or H pups. Basal CORT output over 6 hours was significantly higher in the NHNB group (784.5) than NH (552.1) or H (350.6). Plasma CORT response to CSC differed among groups: in NHNB animals, plasma CORT response was delayed compared to the other groups, becoming evident only at 4 hours post-CSC, and continuing to rise at 6 hours. Plasma CORT output over 4 hours after CSC was higher in the NHNB group versus NH or H groups (942.2 vs 882.15 vs 679.5). This difference was even larger over 6 hours in NHNB versus NH groups (1627.4 vs 1343). The variability of plasma CORT between rats in the NHNB group was significantly greater as compared to the NH or H groups. We report on a paradigm of chronic stress and a superimposed physical stressor that reproducibly demonstrates an abnormal neuroendocrine response in the young rat. This model may emulate the human situation of chronic neglect, and help explain the mechanism underlying behavior and other long-term effects observed in this clinical setting.

References

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