
**Abstract**

The aim of this study was to test whether environmental enrichment alters the status and responsiveness of pituitary-adrenocortical and sympathetic-adrenomedullary hormones in rats. Previous studies have shown that rats kept in an enriched environment differ from those kept in standard cages in dendritic branching, synaptogenesis, memory function, emotionality and behaviour. In male Wistar rats kept in an enriched environment for 40 days, we studied basal concentrations of hormones, endocrine responses to 5-HT1A challenge and responsiveness and adaptation to repeated handling. Environmental enrichment consisted of large plexiglass cages with 10 rats per cage, which contained variety of objects exchanged three times a week. Rats kept in this enriched environment had higher resting plasma concentrations of corticosterone, larger adrenals and increased corticosterone release to buspirone challenge compared to controls. Lower adrenocorticotropic hormone, corticosterone and adrenaline responses to handling were noticed in rats kept in an enriched environment. Exposure to repeated handling led to a more rapid extinction of corticosterone responses in rats kept in an enriched environment. Thus, environmental enrichment leads to pronounced changes in neuroendocrine regulation, including larger adrenals and increased adrenocortical function, which are so far considered to be indication of chronic stress.

© 2004 Blackwell Publishing Ltd