

STRAIN-DEPENDENT LEVELS OF BIOGENIC AMINE IN POST-WEANING SOCIALLY-ISOLATED RATS

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Animal models are important tools in the study of the mechanisms underlying a human disease and design of new treatments. In the case of mental disorders it is difficult to develop an appropriate animal paradigm that may elicit behavioural and neurochemical changes well related to human disorders. Given that disruptions in neuronal activity can affect both human and animal behaviour, it has been widely demonstrated that the isolation rearing of rats (1), provides a non-pharmacological and developmental specific method of inducing schizophrenic-like behavioral deficits (2).

Our study was focused on describing changes in adult neurochemistry in both Wistar (W) and Lister Hooded (LH) rats following postweaning social separation by analysing biogenic amine content in postmortem adult brain, with a particular purpose to the comparison of neurochemical basal conditions in these two different rat strains.

Our results have shown significant differences in basal biogenic amines content of adult brain regions of W rats compared with LH rats. In particular, W rats showed decreased striatal levels of dopamine (DA) ($P < 0.05$) and its metabolites, homovanillic acid (HVA) ($P < 0.01$) and 3,4-dihydroxyphenilacetic acid (DOPAC) ($P < 0.01$), with respect to LH. In W rats the striatal levels of serotonin (5-HT) were also lower decreased than LH animals ($P < 0.0001$). On the contrary, levels of 5-Hydroxyindole-3-acetic acid (5-HIAA) and noradrenaline (NA) in the striatum were not strain-dependent. Furthermore, we observed that socially isolated W rats (ISO group) showed decreased striatal levels of serotonin (5-HT) ($P < 0.05$) with respect to grouped reared (GRP group) animals. The striatal turnover of 5-HT, as determined by the ratio of its metabolite, 5-Hydroxyindole-3-acetic acid (5-HIAA) to 5-HT, was also increased in W ISO animals ($P < 0.05$). In contrast, ISO LH did not show any statistical difference in striatal biogenic amine content when compared to GRP group.

In conclusion, these data provide, for the first time, evidence that W and LH have different basal neurochemical profile and that isolation rearing in the rats results in different strain-dependent brain areas dysfunction.

References:

- (1) Weiss IC and Feldon J. (2001) *Psychopharmacology* (Berl) 156(2-3):305-26.
- (2) Geyer MA and Ellenbroek B. (2003) *Prog Neuropsychopharmacol Biol Psychiatry* 27(7):1071-9.