EFFECTS OF EARLY IRON DEFICIENCY ON CATECHOLAMINERGIC TRANSPORTERS IN RAT BRAIN

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Iron deficiency (ID) is the most common single nutrient disorder worldwide. In this study, we investigated the possible effects of infantile ID on catecholaminergic membrane transporter densities in the brain. At postnatal day-4 (PND4), all pups were out-fostered. Animals were sacrificed at 21, 45 and 75 days of age. We examined individual brain regions specific for DAT; striatum, nucleus accumbens (NA), substanitia nigra (SN), and olfactory tubercle (OT); and others specific for NET; frontal cortex (FC), dentate gyrus (DG), and locus coeruleus (LC). DA transporter ligand binding was performed using [^{125}I]-RTI-55 while NET transporter ligand binding was performed using Nisoxetine HCl [N-Methyl-3H]. Results reveal a significant age effect on DAT levels in NA, OT, and SN respectively but not in the striatum. Specifically, 21-day-old rats had greater DAT levels compared to 45-day-old rats in the NA, OT and SN as well as in the OT compared to 75-day-old rats. There was no main effect for diet and no diet-age interactions. Furthermore, there was a significant age difference on NET levels in the dentate gyrus but not in the frontal cortex or the locus coeruleus. Specifically, NET levels were increased among 45-day-old rats compared to 75-day-old rats. There was no main effect for diet and no diet-age interaction on any of the dependent variables. In summary, early ID in rats alters many monoaminergic-mediated behaviors. Such changes might be irreversible despite the fact that there is a restoration of peripheral and/or central iron.