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Antioxidative properties of progesterone in striatum of permanently occluded adult male Wistar rats

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Progesterone (P4), a naturally occurring gonadal hormone in the brain, and its metabolites, are proposed as potential therapeutic agents in various neurodegenerative animal models given that their neuroprotective properties might be associated with amelioration of oxidative stress. Since P4 actions in rat striatum upon permanent ligation of both common carotid arteries are still ambiguous, the present study aimed to evaluate whether 7 days lasting P4 treatment could modulate the levels of several striatal oxidative stress indicators, including prooxidant/antioxidant balance (PAB), advanced oxidation protein products (AOPP) and products of lipid peroxidation (LPO). For the purpose of the experiment, adult male Wistar rats ($n = 12$) were divided into 3 groups: sham-operated animals subjected to vehicle (commercial flax oil, 1 mg/kg, s.c., Sham + V), occluded animals treated either with vehicle (2VO + V) or P4 (dissolved in commercial flax oil, 1.7 mg/kg, s.c., 2VO + P4). Rats were sacrificed 4 h following the last treatment¹ and striatal synaptosomal fraction was used for further biochemical analyses². Our results demonstrate that investigated oxidative stress indicators are affected to the different extents by P4 treatment. Namely, in comparison to the Sham + V group, PAB level was elevated in 2VO + V rats, while in 2VO + P4 animals it was downregulated to the levels observed in the Sham + V group. In parallel, 2VO-induced alteration of AOPP was decreased following P4 treatment whereas LPO level was still slightly elevated. Overall, our findings suggest that P4 might manifest antioxidative features in the striatum of hypoperfused rats.

Acknowledgments

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