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Investigating the Effects of Rosiglitazone on Short-Term Memory through a PPAR-GAMMA Dependent Pathway

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ABSTRACT

PPAR γ agonists improve cognitive impairment in Alzheimer's Disease (AD) mouse models; however, little is known about the mechanisms by which they affect learning and memory. This study used PPAR γ -agonist Rosiglitazone to test the effects of PPAR γ activation on short-term memory in young versus aged mice. Twenty-one-month-old (21 MO) and 3-month-old (3 MO) male mice were separated into vehicle (n21MO=7, n3MO=8) and treatment (n=8) groups. Y-Maze was conducted before and after injections. Mice were given three i.p. injections of saline or 10 mg/kg of rosiglitazone 24, 3, and 1 hour before testing. EthoVision XT was used to analyze the spontaneous alternation rate (SAR). Statistics are reported as Mean $\pm$ SEM.

Results: Pre-injection SAR differences between groups were not significant for 3 MO (SARVeh=60.35 $\pm$ 3.27%; SARRosig=62.83 $\pm$ 5.45%; P=.7021) and 21 MO (SARVeh=58.40 $\pm$ 3.91%, SARRosig=61.99 $\pm$ 3.89%; P=.5280) mice. Post-injection SAR differences between groups were not significant for 3 MO mice (SARVeh=55.79 $\pm$ 3.28%, SARRosig=55.02 $\pm$ 7.67%; P=.9278) but were significant for 21 MO mice (SARPre = 61.35 $\pm$ 5.03%, SARPost=38.83 $\pm$ 6.58%; P=.0198).

Conclusion: These results suggest that PPAR γ activation had little effect in young mice but induced adverse effects in old mice, although i.p. injection-induced stress potentially affected results. Further research is needed to determine why rosiglitazone has contrary effects in AD and wildtype mice.

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