

P490

Anti-inflammatory effects of *N*-acetylaspartylglutamate in carrageenan induced paw edema in rats

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The present study was designed to evaluate the anti-inflammatory effects of *N*-acetylaspartylglutamate (NAAG), as a presynaptic mGlu3 receptor agonist on carrageenan-induced paw edema in rats. NAAG was administered intra-peritoneally (10 mg/kg) 20 min before the subplantar injection of carrageenan. Neutrophil infiltration (MPO activity), lipid peroxidation (MDA assay), free radical scavenging activity (GPx and SOD assay), IL1 β , TNF- α and PGE₂ levels were assessed in the paw tissue of NAAG treated rats (n=6) compared to control rats (n=8). One-way ANOVA was used to make comparisons between the groups. A Student-Newman-Keuls post test was performed to compare the mean values between the groups. Results showed that i.p administration of NAAG considerably reduced maximum paw volume by 52.57% and total inflammatory response (AUC) by 56.9% four hours after induction of inflammation (P<0.001). Injection of NAAG resulted in a marked reduction of MPO activity in inflamed paw by 80.21% in comparison with control group (P<0.01). Moreover, NAAG not only reduced the MDA levels to 54.36%, but also enhanced the SOD activity in NAAG treated group up to 25% compared to control group. Levels of IL-1 β , TNF- α and PGE₂ in NAAG treated groups were respectively reduced by 72.4%, 23% and 13%. Generally, NAAG activates mGlu3 receptors on sensory neurons, resulting in inhibition of glutamate release and reduction of cAMP levels. Overall, our results suggest that NAAG activation of mGlu3 receptors on sensory neurons reduces the effects of PGE₂ and reduces sensory neuron communication of inflammation.