Gene expression profile associated with fingolimod neuroprotection against LPS-induced memory impairment

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Background: Lipopolysaccharide is an endotoxin to induce sickness behavior in several animal models to explore the link between immune activation and cognition. Neuroinflammation playing a pivotal role in disease progress is evidently influenced by sphingosine-1-phosphate. As one of the sphingosine analogs in clinical use for multiple sclerosis. The present study is designed to evaluate fingolimod (FTY520) efficacy in the context of the mere inflammatory context leading to memory impairment. **Methods**: FTY720 was repeatedly administered for a few days before or after intracerebral lipopolysaccharide (LPS) injection in rats. Animal's brains were then subjected to hematoxyline-eosin staining as well as multiplex mRNA assay following memory performance test. **Findings**: Both FTY720 pre-treatment and post-treatment were similarly capable of ameliorating LPS-induced memory impairment as assessed by passive avoidance test and supported with neuroprotection in dentate gyrus regions. Such amending effects may be partly accountable by the concomitant alterations in transcriptional levels of mitogen-activated protein kinases as well as inflammatory genes determined by QuantiGene Plex and western blot analysis. **Conclusion**: These findings confirming FTY720 application benefits suggest its efficacy may not differ significantly while considered either as a preventive or as a therapeutic approach against neuroinflammation.