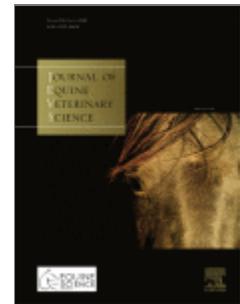




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Effects of Cannabidiol on the In Vitro Lymphocyte Pro-Inflammatory Cytokine Production of Senior Horses

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Highlights

•[Cannabidiol](#) can reduce inflammation, in vitro, in equine.

- In vitro equine peripheral blood mononuclear cells can be affected by Cannabidiol.

- Cannabidiol can reduce equine cytokines, TNF α , IFN γ , and IL-10 in vitro.

Abstract

Cannabis sativa L. contains cannabidiol (CBD), a compound that has many anti-inflammatory properties. In this study, 99.9% CBD powder was used to determine its in vitro efficacy as an anti-inflammatory agent. Heparinized blood was collected *via* jugular venipuncture from senior horses. PBMCs were isolated then incubated for 24 hours with increasing dilutions of CBD dissolved in DMSO. PBMCs were stimulated the last 4 hours of incubation with PMA/IO and Brefeldin A. A Vicell counter was used to evaluate viability after incubation. PBMCs were stained intracellularly for IFN γ and TNF α then analyzed via flow cytometry. RT-PCR was used to analyze samples for gene expression. Five equine-specific intron-spanning primers/probes used are: CB1, CB2, TNF α , IFN γ , IL-10, and Beta-glucuronidase. Data was analyzed using RM One-way ANOVA (significance $P < .05$). Viability of PBMCs with CBD was completed to determine cytotoxicity. The dilution of CBD that did not affect cell viability was 4 $\mu\text{g}/\text{mL}$ ($P < 0.05$). CBD at 4 $\mu\text{g}/\text{mL}$ significantly reduced production of IFN- γ and TNF- α ($P < .05$). RT-PCR results for TNF α and IFN γ at 4 $\mu\text{g}/\text{mL}$ showed a reduction compared with the positive control and IL-10 showed a similar reduction at 2 $\mu\text{g}/\text{mL}$ and 4 $\mu\text{g}/\text{mL}$. RT-PCR gene expression results showed significance for 10 $\mu\text{g}/\text{mL}$ CBD in CB1 and CB2. CBD at 4 $\mu\text{g}/\text{mL}$ reduced *in vitro* production of inflammatory cytokines from senior horses. This in vitro study supports further investigation of CBD to determine if it may be effective as an anti-inflammatory treatment for chronic inflammation in the horse.