The effect of apigenin on chronic inflammatory pain in mice

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Introduction

Current methods of pain management often rely on drugs such as opioids which have significant side effect profiles and high risk of addiction. Apigenin is a flavonoid found naturally in foods such as chamomile tea, celery, and grapefruits. Flavonoids are the most common class of polyphenols making up more than half of the known polyphenols. Previous research on polyphenols and apigenin has illustrated that the drug has anti-inflammatory, anti-oxidant, and neuroprotective properties that indicate potential as a pain relief drug. For example, a study was done where the sciatic nerve of the mice was chronically constricted. Apigenin was administered and after chronic dosing, the drug was shown to reverse chronic neuropathic pain in the mice after the injury. It was hypothesized that apigenin will reverse hyperalgesia in mice treated with CFA through interaction with the α7 nicotinic acetylcholine receptor.

Methods

In order to experiment with the apigenin, two methods of dosing were done: acute (only once) and repeated (once daily). For the acute dosing of apigenin or the vehicle agent, 7 male mice and 8 female mice were given 100% CFA. On the third day after the CFA was injected, 8 mice were given 30 mg/kg of apigenin and 7 mice were given the vehicle agent via oral gavage. Thermal hypersensitivity testing (Hargreaves) was performed at one hour, three hours, and twenty four hours after the drug was administered. For the repeated dosing, 8 mice were given apigenin at a dose of either 30 mg/kg or 50 mg/kg and the other 7 given the vehicle daily for four days. On the fourth day, Hargreaves testing was performed 1 hour and 3 hours after drug administration.

Results

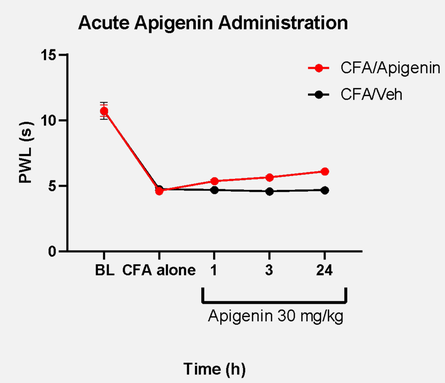

Figure 1: Apigenin increases the Hargreaves times minimally Hargreaves were done at 1 hour, 3 hours, and 24 hours after 30 mg/kg of apigenin was administered

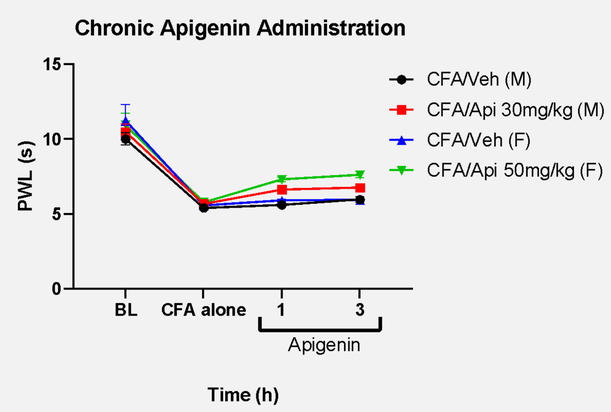

Figure 2: 50 mg/kg of apigenin reliefs the hyperalgesia partially Hargreaves on the mice were done at 1 hour and 3 hours after the apigenin was administered for 4 days

Discussion

Both the acute dosing and the repeated dosing provided a minimal difference giving the mice barely any relief from their pain-like behaviors. The females with the increased dosing had an improvement in their hargreaves times, but still not enough to be considered pain relief. The results illustrated that acute dosing does not provide a sufficient difference to be considered pain relief; therefore, more research on repeated and chronic dosing will need to be done through upping the dose or extending the period of time of administration of apigenin.

References

Wu, Yi, et al. "Evidence for 5-HT1A Receptor-Mediated Antiallodynic and Antihyperalgesic Effects of Apigenin in Mice Suffering from Mononeuropathy." *British Journal of Pharmacology*, vol. 178, no. 19, 2021, pp. 4005-4025, https://doi.org/10.1111/bph.15574. Accessed 30 Jun. 2023.

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