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Feline Interstitial Cystitis / Bladder Pain Syndrome (IC / BPS): Insight into the Protective Effect of a Micronized Formulation of N-palmitoyl-D-glucosamine (PGA) and Hesperidin

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Interstitial Cystitis/Bladder Pain Syndrome (IC/BPS) is a chronic inflammatory disease characterized by visceral pain. Feline Interstitial Cystitis (FIC), an idiopathic and painful condition frequently occurring in cats, reproduces many features of IC/BPS. Recently, a rat model of Chronic Cyclophosphamide (CYP)-induced cystitis has been developed and validated. It was shown to share strong similarity with IC/BPS (and FIC), i.e., the development of persistent painful behavior, bladder edema, and focal urothelial damage. Aliamides are pain-relieving and anti-inflammatory lipid compounds whose parent molecule is almitoylethanolamide (PEA). Although much attention has been paid so far to PEA, some interesting evidence on the benefits of the aliamide N-palmitoyl-D-glucosamine (PGA) is currently being gathered. The aim of this study was to evaluate the effects of supplementing PGA (PGAm) together with the antioxidant hesperidin to rats with chronic CYP-induced cystitis. Cystitis was induced in female rats by repetitive intraperitoneal injections of CYP (40mg/kg every three days from day 0 to day 6). Daily oral supplementation with PGAm-hesperidin (3:1 ratio) was started 3 days before CYP and maintained to the end of the experiment (day 10). CYP instillation caused macroscopic and histological bladder inflammatory changes, mast cell activation, neuroinflammation, increased lipid peroxidation, and lowered pain threshold. PGA m-hesperidin decreased CYP-induced bladder inflammation, oxidative stress (measured through MPO (Myeloperoxidase) and MDA (Malondialdehyde) levels, respectively) mast cell activation, neuroinflammation and relieved visceral pain. Based on these findings and the known safety profile, PGAm-hesperidin may be a useful adjunct in the management of human IC/BPS and the related feline lower urinary tract disease FIC.

Recent Publications

1. Gugliandolo E. (2020), Canine atopic dermatitis: Role of luteolin as new natural treatment. *Vet Med Sci*;6(4):926-932
2. Gugliandolo E (2021), Protective effect of snail secretion filtrate against ethanol-induced gastric ulcer in mice. *Sci Rep.* 11;11(1):3638
3. Gugliandolo E. (2020), Palmitoylethanolamide and Related ALIAMides: Prohomeostatic Lipid Compounds for Animal Health and Wellbeing. *Vet Sci*.16;7(2):78

Biography

Enrico Gugliandolo has research experience in improving animal health and welfare. His research is based both on *in vitro* and *in vivo* experimental models and on clinical observations. Currently, he has published 113 papers in international scientific journals, with an h- index of 30 Scopus.

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