Feline Cystitis, Stress, & Bladder Permeability

Feline idiopathic cystitis (FIC) is diagnosed when no underlying cause for lower urinary tract signs (such as inappropriate urination, stranguria, hematuria, and pollakiuria) can be found. FIC has no known cause and no known effective long-term treatment. Stress may exacerbate the clinical signs associated with the disorder. Thirteen cats with FIC and 12 healthy cats were subjected to a moderate stress protocol (including 12-hour food deprivation and changes in diet and housing) over an 8-day period. Fluorescein, was injected IV on each test day, and serum concentrations of fluorescein as well as urine cortisol-to-creatinine (C:Cr) ratios were obtained and compared between healthy cats and those with FIC. A subset of 6 cats with FIC and 5 healthy cats also had measurement of plasma catecholamine concentrations. After the 8-day stress period, the cats were moved to an enriched environment and the tests were repeated after 21 days. The authors found serum fluorescein concentrations in cats with FIC to be significantly higher than those of controls, especially during the initial period of stress. For cats in which catecholamine concentrations were determined, concentrations of dihydroxyphenylalanine, norepinephrine, and dihydroxyphenylglycol were also significantly higher in cats with FIC versus controls, although no differences in the urine C:Cr ratio between the 2 groups were observed. After the cats were in the enriched environment for 3 weeks, plasma fluorescein and catecholamine concentrations appeared to decrease. The authors concluded that cats with FIC seem to have altered bladder permeability. In addition, increased concentrations of dihydroxyphenylalanine, the first reaction product in the catecholamine synthetic pathway, suggest stress-induced increases in tyrosine hydroxylase, which catalyzes the rate-limiting step in catecholamine synthesis. The contrasting lack of difference in urine C:Cr ratios, a test that is a sensitive indicator of adrenal response to stress, suggested a dissociation between the sympathetic nervous system and the hypothalamic-pituitary-adrenal axis response to stress. The decrease in plasma fluorescein and catecholamine concentrations after environmental enrichment suggests that further studies should be done to evaluate this treatment option for cats with FIC.

COMMENTARY: This study may help increase understanding on how and why cats are affected with FIC and how this disorder might be controlled. Interestingly, an earlier study done by the same authors showed that, when stressed, cats with FIC had increased plasma concentrations of corticotropin-releasing factor and adrenocorticotropic hormone without a corresponding increase in plasma cortisol. The adrenal glands of these cats were also found to be significantly smaller than those of healthy cats, and the authors suggest that cats with FIC may have decreased adrenocortical reserves. Because glucocorticoids reportedly inhibit catecholamine production, the authors suggest that the lack of cortisol in cats affected with FIC may result in or perpetuate increased sympathetic nervous system outflow activity, which in turn may increase epithelial permeability. While the cause of altered bladder permeability is still not fully understood, it appears from this study that stress does play a role. Further studies in treating these cats, whether with environmental enrichment or drugs (such as the tricyclic antidepressants with sympatholytic activity that are currently used in some chronic cases), would be interesting.—Jennifer L. Schori, VMD

Dogs & Babies: Never Alone Together!

This paper describes 3 separate instances in which unattended infants in baby swings were fatally mauled by the family dog. The breeds involved were a pit bull, chow-chow, and a Labrador-pit bull mix. Two of 3 infants sustained nearly 300 puncture wounds and massive tissue damage. The major triggers for canine aggression include dominance aggression, possessive aggression, territorial or protective aggression, pain aggression, or redirected aggression and predatory aggression. The authors could not rule out dominance aggression as a trigger but made a stronger case for predatory aggression as the trigger. They hypothesized that predatory aggression was triggered in these dogs by the movement of the swing.

COMMENTARY: It is impossible to know what triggered the fatal attacks in these cases. The authors propose the mobile swing as a possible precipitator of the attack. These parents more than likely assumed that because the child was in a swing it was “protected.” Children should never be left unattended with family pets.—Karen A. Moriello, DVM, Diplomate ACVD