FOCUS Transdermal Cyclosporine for Cats

Transdermal cyclosporine delivery may minimize problems with oral administration (eg, GI upset). In this crossover study, oral and transdermal blood concentrations of cyclosporine were compared. Cats (n = 6) received oral cyclosporine (5 mg/kg) for 7 days; whole blood was collected on the last day at 2 and 12 hours postadministration. After a 2-week washout period, a compounded transdermal formulation (25 mg in 0.1 mL gel) was applied q24h to the pinna for 21 days. Whole blood was collected at 2 and 12 hours postadministration on days 7, 14, and 21. Random samples of the transdermal formulation showed the cyclosporine concentration to be within 10% of the target concentration of 250 mg/mL. Median blood concentrations after the seventh day of oral administration were 2,208 ng/mL and 1,232 ng/mL at 2 and 12 hours postadministration, respectively. For the transdermal formulation, median blood concentrations 2 and 12 hours postadministration were 37 ng/mL and 37 ng/mL on day 7, respectively. There was no significant difference between day 7 and day 21 serum concentrations at either 2 or 12 hours posttransdermal application. There was a significant difference in blood concentrations between oral and transdermal application. Therapeutic blood concentrations were achieved in only 1 of 6 cats using transdermal cyclosporine.

Commentary

This study was completed before the liquid formulation of feline cyclosporine was available. It is likewise important to note that the dose for cats is 7 mg/kg (vs 5 mg/kg in dogs). In my experience, feline cyclosporine is easily administered and more or less readily acceptable to the cat. There is little scientific support for how well transdermal gels work in veterinary dermatology; the most commonly cited reason for their use is the difficulty in administering oral medication to cats. The pinna is the target application site to prevent licking, but anyone who owns a cat knows that the average cat easily grooms its face and ears. Ideally, with transdermal application to the thin skin, it will be absorbed *before* the cat grooms it off. Besides lack of proven efficacy of transdermal drugs, there is a real concern for contact or irritant reactions, inconsistent dosing, and increased exposure of the drug to humans. The client may be aware that a medication has been applied to the ear, but other family members (eg, children, other cats) may not.—*Karen A. Moriello, DVM, DACVD*

Source

Absorption of oral and transdermal cyclosporine in six healthy cats. Miller R, Schick AE, Boothe DM, Lewis TP. *JAAHA* 50:36-41, 2014.

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RESEARCH NOTE: Canine Infections of Human Influenza

Influenza virus has not been considered a major pathogen of dogs; however, recent reports have suggested respiratory disease—and sometimes death—in dogs with influenza A viruses, including *H3N8* of equine origin in the U.S. and UK and highly pathogenic *H5N1* avian virus in Thailand. Avian origin *H3N2* infection was also identified in pet dogs in Korea and China. Additional reports from various regions have documented dogs infected with A(*H1N1*)pdm09 virus of swine origin, possibly contracted from contact with infected humans, suggesting human–dog transmission.

A serologic survey of human influenza virus infection in domestic dogs was conducted in Japan, examining 366 serum samples from mostly indoor dogs. Virus-neutralization (VN) tests were performed to detect antibodies specific to human influenza with a former seasonal *H1N1* virus, seasonal *H3N2* virus, A(*H1N1*)-pdm09 virus, and influenza B virus.

Fourteen samples reacted to A(*H1N1*)-pdm09 virus. Eight additional samples were positive to seasonal *H3N2* virus. These samples did not react with dog *H3N8* virus or avian *H3N2* virus, suggesting human-to-dog transmission. Six samples were positive to type B virus. None of the positive dogs demonstrated clinical signs of influenza. Results confirmed that dogs can be infected with human influenza virus, including type B, and suggested that dogs may act as a vector for human influenza virus transmission within households. This raises the concern that dogs may act as intermediate hosts for the emergence of new, potentially pandemic viruses. Continued surveillance is encouraged.

Source

Serological evidence of infection of dogs with human influenza viruses in Japan. Horimoto T, Gen F, Murakami S, et al. *VET REC* 174:96, 2014.

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