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CLINICAL CASE

Systemic calicivirus infection successfully treated with famciclovir in two cats☆

Deux cas de calicivirose systémique traités avec famciclovir

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Summary Two cats were admitted for skin lesions and lethargy. The first cat showed acute facial and limb crusting, pustular dermatitis, severe depression and poor appetite. The second cat showed crusting and hemorrhagic lesions on the nasal planum associated to anorexia and lethargy. EDTA blood and swab of cutaneous and mucosal ulceration were tested for feline calicivirus, feline herpesvirus and *Chlamydia* spp by RT-PCR. Both blood, skin and mucosal lesions were positive for FCV. Cats were negative for feline leukemia virus and feline immunodeficiency virus. Cytology of skin lesions was no consistent with pyoderma and pemphigus foliaceus. Blood analysis revealed hypereosinophilia and systemic inflammatory syndrome. Based on these finding, a diagnosis of systemic calicivirus was made. Both cats were treated with oral famciclovir. Thirty-nine days and Thirty-two days after starting antiviral therapy, cutaneous and mucosal lesions were completely healed in respectively the first and the second cat. No consensual treatment of calicivirus infection exists and systemic disease is often fatal. We report two cases of systemic calicivirus infection associated with skin lesions successfully treated with famciclovir, suggesting the antiviral effect of famciclovir against calicivirus.
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Background

Feline calicivirus (FCV) is a common pathogen of worldwide cats [1]. Multiple strains of FCV have been reported. Their genetic and antigenic variabilities allow the virus to escape from the host immune response therefore some differences exist in pathogenicity and tissue tropisms; vaccination is not protective against all strains [1,2]. Symptoms are typically associated with upper respiratory tract, vesicles and erosions on the tongue being frequent and characteristic features. FCV has also been associated with other various clinical signs, such as sudden death, paws and mouth's disease, ulcerative dermatitis, agitated state, abortion, jaundice and the feline chronic gingivo-stomatitis complex [1]. The presence of FCV in cats with lower urinary tract disease has also been reported [3], but the cause—effect link remains unconfirmed. Several outbreaks of FCV have been associated with a high (35—60%) mortality, the so-called ''hypervirulent strains'', for which the presence of retrovirus disease represents a negative prognostic factor [1,4]. Treatment of different forms of FCV infection depends on clinical manifestation and tissue tropism. Upper respiratory tract disease is usually self-limiting [1], whereas chronic gingivo-stomatitis complex usually requires immune-modulating treatment. No consensual treatment of systemic calicivirus infection exists and disease is often fatal [1].

The aim of this article is to describe two cases of severe forms of calicivirus infection, associated with systemic and cutaneous lesions successfully treated with famciclovir orally.

Case presentation 1

A 2-year-old, neutered, male domestic shorthair was admitted for acute facial and limb crusting, pustular dermatitis, severe depression and poor appetite. The cat was vaccinated against feline enteritis, feline herpesvirus and feline calicivirus and came from a single household. Two days before, an idiopathic urethral obstruction was diagnosed and treated with IV buprenorphine (Bupaq Multidose, Virbac), oral alfuzosin (Xatral, Sanofi-Aventis) and oral diazepam (Valium, Roche). Clinical examination revealed dehydration at 8%, hyperthermia (40.4 °C), oral and cutaneous ulcerations, limb crusting, edema, small, intact, follicular pustular sores and alopecia (Fig. 1A and B). The results of hematological and chemistry plasma examinations showed lymphopenia ($0.85 \times 10^3/\mu L$), hypereosinophilia ($736.6 \times 10^3/\mu L$), increased band neutrophils count and hyperbilirubinemia (40.8 μmol/L. RI < 17). The urine analysis showed macro-bilirubinuria and moderate proteinuria. The cat was tested for feline immunodeficiency virus (FIV) and feline leukaemia virus (FeLV) and was negative. The serum protein electrophoresis revealed an acute inflammatory component in alfa(α)2-globulin fraction, a chronic inflammatory component in beta(β)2-globulin fraction and hypoalbuminemia (22 g/L, RI 25—39). Aspiration cytology of pustule content revealed degenerate neutrophils, without microbes or acantholytic cells. EDTA blood and swab of cutaneous and oral ulceration were tested for feline calicivirus (FCV), feline herpesvirus (FHV) and *Chlamydia* spp by real-time PCR. Both blood, skin and oral lesions were positive for FCV. The cat was hospitalized and IV NaCl 0.9% fluids (3 mL/kg/h) and single dose of SC tolfenamic acid (Tolfedine 4%, Vetoquinol S.A., 4 mg/kg) were administered in order to restore normal hydration and temperature respectively, but no improvement in clinical conditions was observed. A protocol with oral famciclovir 125 mg q12 h (Oravir, Novartis Pharma SAS) was started two days after hospitalization (day 0). At day 11, crusting and pustular limb sores were still present (Fig. 1C), but edema disappeared. The ulcerating glossitis started to heal (Fig. 1D). At day 20, crusting, ulcerating and pustular lesions were markedly decreased, but alopecia persisted (Fig. 1E and F).

Case presentation 2

A 13-year-old neutered female domestic shorthair cat was admitted for anorexia, lethargy and crusting and hemorrhagic lesions on the nasal planum. The cat was vaccinated against feline enteritis, feline herpesvirus and feline calicivirus. It has been in close contact with a kitten died after displaying apathy, fever, nasal discharge and ulcers on the tongue. Clinical examination revealed dehydration at 10%, hyperthermia (40.1 °C), lip edema, crusting and ulceration of nasal planum and ulcerated glossitis (Fig. 2A and B). The results of hematological and chemistry plasma examinations showed lymphopenia ($0.50 \times 10^3/\mu L$), hypereosinophilia ($291 \times 10^3/\mu L$), increased band neutrophils count and hyperglobulinemia (52 g/L, RI 28—51). The urine analysis showed moderate proteinuria. FIV-FeLV testing was negative. Microbes were not observed on cytology. EDTA blood and swab of nasal ulceration were tested for FCV, FHV and *Chlamydia* spp by RT-PCR. Both samples were positive for FCV. The cat was hospitalized receiving IV NaCl 0.9% fluids (3 mL/kg/h) and SC tolfenamic acid (Tolfedine® 4%, Vetoquinol S.A., 4 mg/kg), for restoration of normal hydration and temperature respectively, but no improvement in clinical conditions was observed. A protocol with oral famciclovir 125 mg q12 h (Oravir, Novartis Pharma SAS) was started after three days of hospitalization. Five days later, the facial edema and hyperthermia disappeared. After 12 days, a marked improvement in nasal lesions and glossitis was observed (Fig. 2C and D). Because of continuing anorexia, a nasogastric tube was posed. Improvement in nasal lesions continued until day 20 where a clinical healing was observed (Fig. 2E and F).

Discussion

FCV is detected in up to 40% of cats living in large groups (i.e. colonies or shelters) and in about 10% of privately owned cats living alone or in small groups [5] and the risk for development of FCV systemic disease is common related to multi-cat environments [1,5]. The source of infection could be associated with the introduction of an infected kitten in the environment of the second examined cat, while the origin of the infection in the first cat was unknown. Most of the outbreaks of FCV systemic disease described to date were nosocomial [1]. FCV is generally considered to remain infective for at least two weeks in the environment and is not

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