

Veterinary Medicine in Human Pandemics: Feline Infectious Peritonitis Compared to Long Covid

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Both diseases are poorly understood and multisystemic with a variety of similar symptoms

Feline Infectious Peritonitis (FIP)

Coronavirinae

α-Coronavirus

FCoV

High mutation rate¹

Same family as Human common cold virus HCoV-229E known to interfere with Reactive Oxygen Species²

Latency period

Feline Enteric Coronavirus (FECV) mutates spontaneously to the virulent Feline Infectious Virus (FIPV). Changing in cell tropism (7-14 %) from **enterocytes** to **monocytes/macrophages**

Respiratory burst

FCoV replication after infection in mature apical columnar epithelial cells of the small intestine, **persistence** in the colonic columnar epithelial cells. Persistence in monocytes/macrophages is required for the outbreak of FIP (distribution all over the body)¹. Following primary infection, three scenarios have been documented: fairly resistant (5 %) temporary low-level shedding (70-80 %), long-term persistent shedding (10-15 %) of high viral loads¹.

Characteristics of FIP

FIP in young animals from a crowded environment (catteries). The mutation from FECV to FIPV is stress-related and depends on genetics¹.

Antibodies: No diagnostic value in FIP

(In end-stage FIP antibodies can drop below limit of detection)

Non protective antibodies and formation of immune complexes³
Granulomatous vasculitis in the follow-up of Antibody-dependent Enhancement (ADE)^{4,5}

B-Cell/T-Cell populations modified^{6,7}

Increased serum amyloid A⁸

Progression with waxing and waning

30 % show neurological symptoms. Fatal outcome¹

New infection with mutated virus always possible¹

Diagnosis, Treatment and Vaccination

Diagnostic criteria: Not specific

Treatment : 3-months administration of GS-441524 or Remdesivir⁹

Vaccination: Attenuated virus is known to induce a fatal outcome¹⁰

A successful vaccine for FCoV free cats is Primucell® FIP, the virus is modified and can only multiply at the temperature of nasal mucosa.

Long Covid (LC)

Coronavirinae

β-Coronavirus

SARS-CoV-2

High mutation rate

Zoonosis transferred likely from bats to the human species

No latency period

Primary target of SARS-CoV-2 in the acute phase Covid-19 is the ACE-2 receptor

Respiratory burst

Characteristics of LC

Viral remains/viral **persistence** in multiple organs¹¹, including the **gastro-intestinal tract**¹²

73 % women (mean 46 years old)¹³

Modified monocytes when the virus remains¹⁴

MCAS (Mast Cell Activation Syndrome)¹⁵

Antibodies: No diagnostic value in LC^{16,17}

Autoimmune antibodies^{16,18,19}

Imbalance of T-Cell population²⁰

Amyloid fibrin microclots²¹ can explain the onset of autoimmune disease, including those of the brain.

Frequently detected autoimmune diseases in patients with onset during Covid-19 and LC: lupus, rheumatoid arthritis, Hashimoto's thyroiditis, Bell's palsy, atypical myasthenia gravis, type 1 diabetes, tinnitus (Autoimmune Inner Ear Disease), ...
How many more?

Progression related to crashes, **fluctuating**, depending on the clinical case (improvement, stabilization, worsening of symptoms)

High proportion of **neurological symptoms**

New infection possible

Diagnosis, Treatment and Vaccination

Diagnostic criteria: Not specific

Treatment : None (spontaneous recovery in about 10 % of the patients, healing sawtooth-like → patients don't know, if they are in a crash or healing → psychologically devastating situation)

Vaccination : Several vaccines available

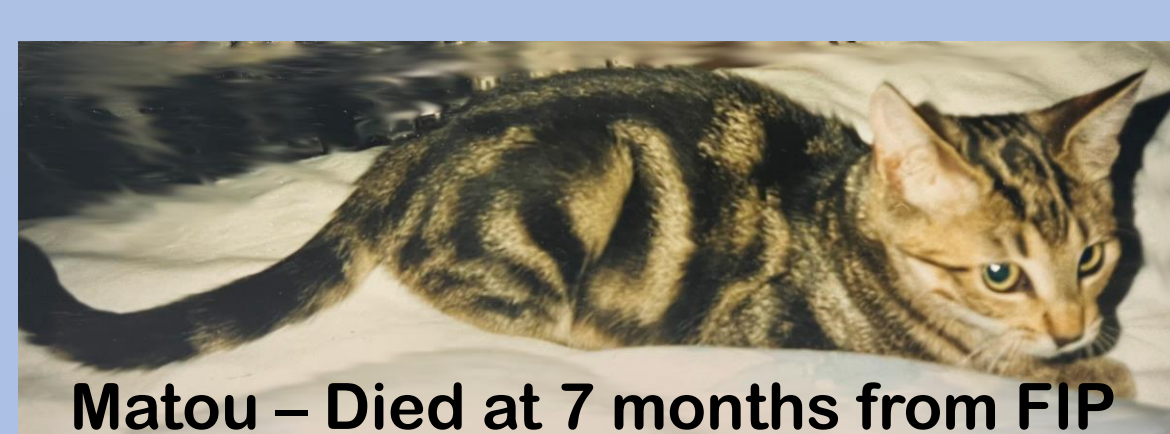
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Matou – Died at 7 months from FIP

