



CHALLENGES AND APPROACHES IN THE TREATMENT OF FELINE INFECTIOUS PERITONITIS

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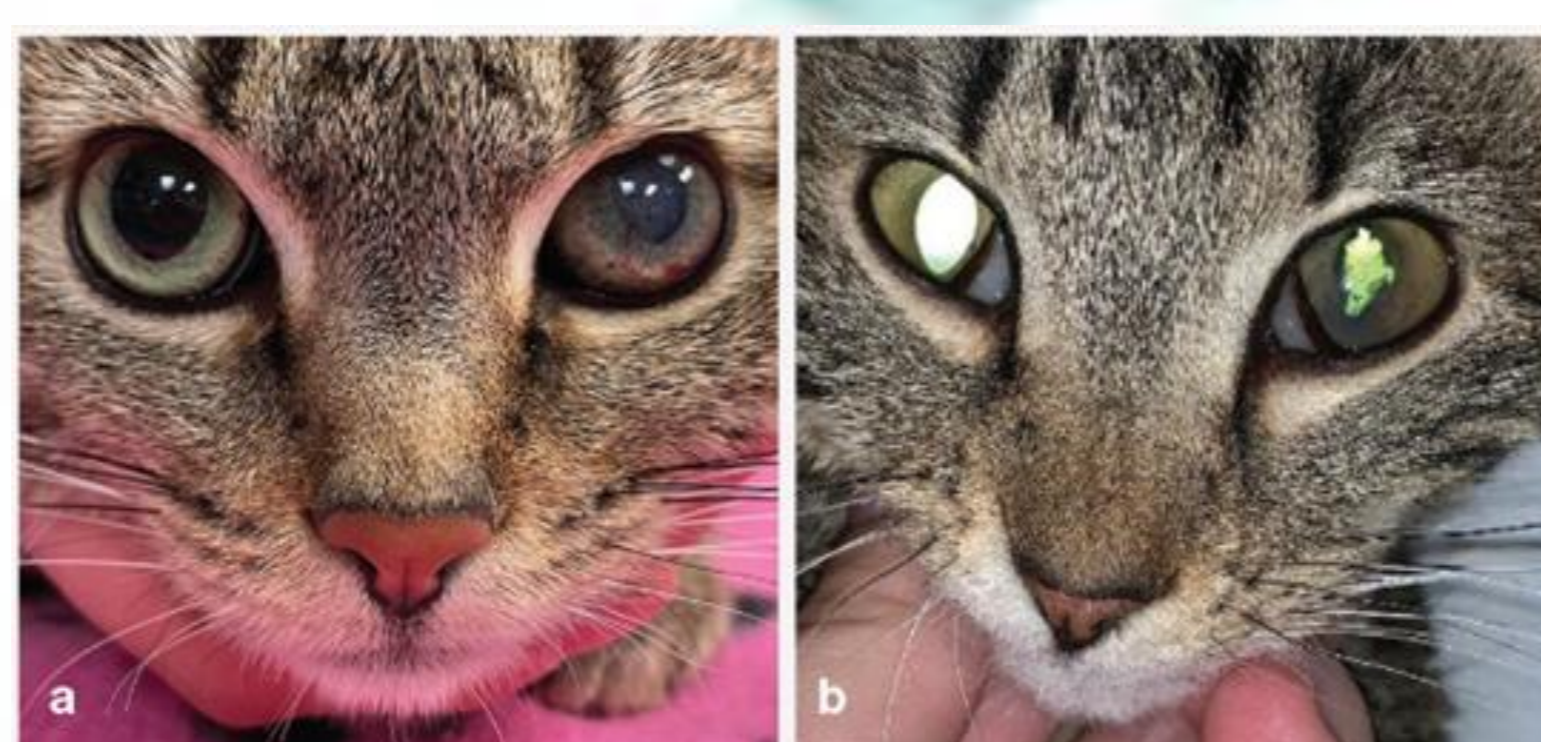
Abstract: Feline infectious peritonitis is one of veterinary medicine's most lethal viral infectious diseases. The infectious peritonitis virus is classified in the family *Coronaviridae*, genus *Coronavirus*. Despite extensive research, finding an effective treatment for FIP has proven elusive, leaving veterinarians and cat owners with limited options and a sense of helplessness. The desperate need for an accessible and efficacious treatment has led researchers to explore antiviral agents that could potentially combat this devastating disease. In recent years, the antiviral compound GS-441524 has emerged as a promising candidate for FIP treatment. Originally developed as a nucleoside analog to target RNA viruses, GS-441524 has shown remarkable effectiveness against coronaviruses. Its close resemblance to the better-known Remdesivir, an antiviral drug used in human medicine, has spurred interest in its potential application for FIP.

• Introduction

- Holzworth first described feline infectious peritonitis in 1963 (Boston, USA), and the first published work on it was in 1965. The disease is widespread throughout the world and is of importance because of the morbidity that can be increased in communities [1].
- Coronaviruses comprise a large family of RNA viruses that infect a wide variety of mammalian and avian hosts, causing severe disease in some of them. Their high diversity causes the continuous emergence of new coronavirus variants that can have changed target cell tropism and/or host spectrum and lead to interspecies or zoonotic transmission; recent examples of the latter are Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV), Middle East Respiratory Syndrome Coronavirus (MERS-CoV), and the most recent Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) causing Coronavirus Infectious Disease 2019 (COVID-19). Only a small proportion (7–14% in multi-cat environments) of cats infected with FCoV, which is very common among multi-cat populations, develops the fatal disease feline infectious peritonitis (FIP), triggered by spontaneous mutation of FCoV, thus gaining tropism for monocytes/macrophages in individual cats. All cats with FIP either die or have to be euthanized without the availability of effective treatment. The median survival time of untreated cats is only eight to nine days [2].

• Material and method

- In our trial, we had 4 cats, which were confirmed by RT-PCR for FCoV and albumin, globulin ratio. We used 5mg/kg each and cat #2 already had paresis 10mg/kg and supportive treatments. They received for 84 days one single dose per day of GS-441524.
- Each of them came with characteristic ascites, as additional treatment we used Vitamin B supplements, probiotics, and liquid food, and in two cats we did thoracocentesis. Cat no 1, received Methylprednisolone, during the first 7 days, while we waited for the result from the laboratory. None of the four cats had any related diseases before treatment, and no disease developed after the treatment.



Cats with uveitis caused by FIP virus

• Results and discussions

All patients treated with the drug product GS-441524 survived and were completely cured at the end of the observation period. Their general condition recovered completely, with no clinical signs of disease or changes in blood tests. Body weight increased significantly this can be seen in table 3.1., but these results we consider not very conclusive due to the free fluid in the abdomen present at the beginning of the disease. From the results obtained when weighing the cats it could be observed that the body weight increased considerably, which leads to the strengthening of the claim that this new approach with this antiviral product is beneficial. At the end of the treatment, one patient was tested for feline coronavirus by PCR. The result was negative. This again underlines the efficacy of GS-441524 treatment against feline infectious peritonitis.



Abdominocentesis

• Conclusions

- ❑ In cats treated with GS-441524 we can say that this product reflects a notable success in treating feline infectious peritonitis.
- ❑ GS-441524 demonstrated significant efficacy, improving clinical parameters and contributing to an increased survival rate. Treated cats also showed improved quality of life, manifested by active behaviour and increased appetite.
- ❑ GS-441524 showed the ability to directly target the virus, inhibiting its replication, which led to a hope to treat an incurable condition.

