



FIP SYMPOSIUM

..... PURRsuig FIP and WINNing

Veterinary nurses or technicians are often the team members left to pick up the pieces, explain exactly what the doctor meant when she tells the client “Your kitten has feline infectious peritonitis (FIP),” and to better explain what the tragic prognosis is.

From weeks to months later, that same technician or nurse may be consoling family members when the kitten is euthanized.

That’s the way it’s always been with FIP. First off, it’s sometimes difficult to diagnose in the first place. Then presenting that diagnosis to a shocked family, who might even have a new kitty because they recently lost a senior cat whom they are still grieving.

FIP antiviral drug research

In his 1991 book, *Feline Husbandry: Diseases and Management in the Multiple-Cat Environment*, Niels Pedersen, DVM, PhD offered no information regarding a treatment for FIP. “How could we? There was none; we didn’t even yet fully understand the disease,” he said at the 2019 Winn Feline Foundation FIP Symposium: *PURRsuig FIP and WINNing*, held at the school’s campus last November.

Pedersen, and the consensus among the attending investigators from around the world is that today FIP is potentially treatable, and perhaps even curable. But the story is as complex as the disease itself.

Pedersen, now distinguished professor emeritus at the University of California, Davis, was among the first to describe FIP. And he spent much of his career chasing the elusive and complex disease.

Pedersen was the first to speak at the day

and half long Symposium. He told the story of how a few years back he approached pharmaceutical company, Gilead Sciences, with a hunch about using its antiviral drug—GS-441524—to combat FIP. In clinical trials, the drug proved effective for the effusive or “wet” form of FIP, but wasn’t readily able to cross the blood-brain barrier to treat the neurologic FIP, seen in the non-effusive or the “dry” form of FIP. Nevertheless, GS-441524 appears to be fairly safe in cats, and at higher doses, the drug can reach therapeutic concentrations in the nervous system.

Unfortunately, the story of GS-441524 ends there; Gilead refused to pursue approval of the drug from the U.S. Food and Drug Administration (FDA) to treat FIP or to give up its patent. Pedersen was disappointed. Still, he persevered.

Pedersen, with collaborators at Kansas State University, including Yunjeong Kim, PhD, DACVIM, associate professor



Dr. Niels Pedersen (image by Steve Dale)

in the department of pathobiology and diagnostics in the school’s College of Veterinary Medicine, demonstrated a similar antiviral compound they developed—known as GC376—also had a high degree of success in treating the wet form of FIP.

But now what?

FIP treatment compounds

Anivive Lifesciences, an animal health pharma company, recognized potential. Dave Bruyette, DVM, DACVM, its chief medical officer, announced at the symposium the company is in the process in getting GC376 FDA-approved for treating FIP, but seeing it come to market could be a long way off. “Realistically, it takes approximately 10 to 14 years to get a drug approved from the time some guy in the lab discovers a molecule until the time you can purchase an FDA-approved drug, and it costs more than \$2 billion to go from a small molecule to get it through to FDA approval process and to market,” he said.

However, Bruyette is under pressure to move faster. First off there’s clearly a need, and then there’s the competition. So, he’s asked FDA’s Center for Veterinary Medicine to accept GC376 for minor use for major species (MUMS) approval, but a speedier process will still take years. And if you happen to have a client with an FIP cat, years away is no help.

More than one Chinese company has figured that out. They’re selling compounds, which they maintain can cure FIP. And by all accounts, at least some cats are getting better with some of the black-market products.



Dr. Dave Bruyette (image by Dr. Vicki Thayer)



Dr. Leslie Lyons, Dr. Glenn Olah, Peter Cohen (image by Dr. Vicki Thayer)

The most prominent of these Chinese sellers is a company called Mumian Biotechnology. Several company representatives attended the symposium, including its chief executive officer Lu Ziyu. Also, in attendance were cat owners whose cats have reportedly been cured using Mutian's compound to the tune of approximately \$4,000 for a 3-kg cat. Cost varies depending on the patient's weight.

Other Chinese companies have popped up and have undercut Mutian's cost to consumers. "The difference between Mutian and the other brands is we are the only good manufacturing practices (GMP) standards manufacturer in China to produce these kinds of products," Ziyu said from the audience during panel discussion. "[The other companies] are currently illegal in China."

FIP compound safety and efficacy

So, what is in the Mutian drug? Ziyu won't be specific, noting that information is proprietary, but he says it's not exactly either GS-441524 or GC376.

"We don't know what this stuff really is," Pedersen said. "And this is black market. It's definitely the Wild West out there." He cautions veterinary professionals against ordering the black-market product but adds there is nothing preventing a

cat's owner from doing so. So, should you support that client?

Pedersen said, "A client is desperate. 'Do I have some sort of a duty?' Veterinarians do also have the right to say, 'No, I don't want anything to do with this.' And I can understand because that ends the possibility for any legal problems. I would answer it this way. Is there anything you're doing in this situation that would be counter to it or is your participation supportive of what your oath is?"

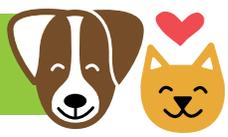
Glenn Olah, DVM, PhD, DABVP, is the immediate past president of the Winn Feline Foundation and a feline veterinarian in Albuquerque, NM. "It's definitely an individual decision," he said. "But I've supported one client so far, and the cat is thriving (on the Mutian drug). I figured if the client is game, we all want these kittens to live."

Susan Gingrich, who raises money for FIP studies and supports the nonprofit Winn Foundation Bria Fund (named for her own kitty who succumbed to FIP), isn't a fan of the black market. "There are things out there that can help cats live longer and better with FIP, living with a chronic disease is possible. The best thing is to get that diagnosis as soon as you can. Start something, be it doxycycline and prednisolone, or polyprenyl

immunostimulant (PPI). It may work, it might not. I don't believe we should make a scientific experiment of our own cats."

Al Legendre, DVM, DACVIM, professor emeritus from the College of Veterinary Medicine at the University of Tennessee—Knoxville, researched PPI and conceded only a very small subset of cats with dry FIP may benefit long term from the biologic if treatment begins early on in the disease process. And as a side note, he added, "Cats that received PPI and prednisolone lived a significantly shorter period of time than the ones that received PPI alone. So, it does seem like it has a significant suppressive effect on the immune system."

Katrin Hartmann, Dr. med. vet., Dr. Habil., DECVIM-CA, professor of internal medicine and head of the clinic of small animal medicine at Ludwig Maximilian University Munich in Germany, added, "Yes, of course you give symptomatic treatments such as esophageal tubes to make sure they get enough nutrition, supporting nutrition in other ways (such as appetite stimulants like Mirataz), draining cats with effusive FIP, and so on. We have done a lot of things. But if prednisolone does something, it usually makes them feel better and gives them more appetite. And there's a chance they'll get better, but



mostly they eventually just go downhill.”

Peter Cohen, who raises money for FIP studies via his nonprofit Zen By Cat said, “Today, the only way to cure an FP cat is through these Chinese companies. Sometimes (what clients order) may even be intercepted (by U.S. Customs) and there’s a pretty expensive price tag. This isn’t ideal. We’d rather have an approved drug. But cats with FIP can’t wait.”

Still arguably, even a better idea to prevent, which a vaccine can do. Gregg Dean, DVM, PhD, DACVP professor and Department Head in the Department of Microbiology, Immunology, and Pathology, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, said, “When it comes to vaccines, we all have a home run in mind, one shot and durable lifelong immunity. Or maybe there’s a vaccine needed to protect cats only when in high density situations, such as shelters or catteries.”

And many shelter professionals discussed how minimizing stress in shelters has indeed lessened the volume of FIP in shelters. “Today the highest risk groups are fosters and sanctuary kittens and cats,” said Kate Hurley, DVM, MPVM director of the UC Davis Koret Shelter Medicine Program. “As there are often too many of them, and that volume is stressful.” Many discussed how stress does seem related to at

least one explanation regarding why some kittens develop FIP and others do not.

The role of genetics in developing FIP

And what role does genetics play? Geneticist Leslie Lyons, PhD, a Gilbreath McLorn Endowed Professor of Comparative Medicine in the Department of Veterinary Medicine & Surgery, College of Veterinary Medicine, University of Missouri –Columbia, MO. said, “I want to know if there a genetic reason why only 11 percent of cats infected with the corona virus get FIP. The answer is we really don’t know anything about the genetics for FIP at this point in time. We make presumptions regarding (some) breeds (being more predisposed) but we need to know much more.”

When talking about stress, it’s not uncommon for kittens to be spay/neutered, and then return home to very quickly develop FIP. “The experience is that the outcomes are not worse for the cats that have surgery at one and a half pound,” added Hurley. “We now have years of data on this. Additionally, if it’s somebody’s pet kittens, and they’re raised up in a home, and there’s no time pressure, or anything fine. Wait until two, two and a half, three pounds, that’s fine. But there is risks to being in a shelter, or overwhelming of foster programs, so that litters start doubling up,

or the kitten starts staying an extra week, or 10 days in the shelter. In our experience, very often those risks outweigh.”

Pedersen said that after spay/neuter, he believes returning the cats to their home as soon as possible is beneficial because the kitties are less stressed in their own homes.

A video was screened at the Symposium from University of Glasgow researcher Diane Addie, PhD, BVMS, MRCVS (since she was unable to attend in person). She said, “I wondered if the cat litter itself could be used to prevent virus transmission, and tested 15 cat litters in the laboratory at Glasgow Veterinary School. We found that bentonite-based cat litters prevented infection of subculture, then we looked at virus shedding while cats were using flat cat litters in two Danish multi-cat households which hadn’t any coronavirus infection.”

She added, “Dr. Eelsey Cat Attract was introduced, the number of cats shedding coronavirus reduced. When the litter was changed, virus shedding ramped up again. When we reintroduced it, again the virus shedding reduced.”

There’s likely never in the history of feline medicine been such an impressive gathering of a wide variety of stakeholders—from veterinary professionals to shelter workers/volunteers to cat fanciers to adoring cat lovers – and from around the globe (since there was a live feed available) to discuss one single issue in feline health.

Learn more at www.winnfelinefoundation.org.

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ABOUT STEVE DALE

Steve Dale, CABC, has served on the Board of Directors of the Winn Feline Foundation for about 15 years. He is co-chair of the Winn Feline Education Committee and helped to organize the Symposium, and served as the Emcee. Steve has contributed to *The Cat: Clinical Medicine and Management*, edited by Susan Little, DVM, DABVP (Feline) and authored the introduction to *Decoding Your Cat* authored by members of the American College of Veterinary Behaviorists. He the host of three pet radio shows, and speaks at veterinary meetings around the world. His website is www.stevedalepetworld.com.

