

Feline Infectious Peritonitis in Pregnant Cats

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Introduction - Pregnancy is an interesting immunologic paradox. Although organs and tissues from individuals of same (allograft) or different species (xenograft) are recognized as foreign and destroyed, the fetus, which is an allograft, is not. Prevention of fetal rejection is accompanied by events linked to the complex hormonal changes that are occurring.¹⁻⁴ The effects of pregnancy involve many functions of the immune system.¹⁻⁴ However, a major effect is on T cell immunity.² T cell immunity is mediated by a class of thymus influenced lymphocytes that are active in identifying host cells that have been infected rendered as foreign to the body by their interactions with pathogens. T cell immunity also plays an important role in autoimmune disease.

The immune modulation that occurs during pregnancy can have variable effects on the mother's immunocompetence. Pregnancy is known to both improve and worsen autoimmune diseases, to increase the post-partum incidence of autoimmune diseases and to increase susceptibility to many common bacterial, fungal, and viral diseases.⁴⁻⁷ The incidence of these diseases is greatest in the third trimester when blood levels of estradiol and progesterone are highest.⁴

Even though mothers may be more susceptible to certain infections during pregnancy, the fetus remains protected from maternal infections through a placental barrier that exists between maternal and fetal bloodstreams. Although this barrier is highly efficient in keeping out infectious agents, it is porous to most drugs. Therefore, the placental barrier is different from the blood-to-brain barrier in being more committed to infectious agents, while the blood-to-brain barrier excludes both drugs and pathogens.

FIP and pregnancy – There are limited published reports on FIP in pregnant queens.⁸⁻¹⁰ Based on additional experience of the author with a small number of cases observed during treatment of FIP with GS-441524, it appears that affected queens are in subclinical or pre-clinical stages of FIP when pregnancy occurs. The immunosuppressive effect of the pregnancy than allows the infection to progress to a clinical stage, usually in the last trimester. The most common clinical form of FIP in pregnant cats is abdominal and wet, and clinical signs usually appear late in pregnancy, at the time of parturition, or shortly thereafter.

FIP in the queen also affects the kittens depending on the severity of the infection and its timing. Kittens either die early in gestation and are resorbed, somewhat later in pregnancy and aborted, and late in pregnancy they may be born sickly and die soon after birth.⁸⁻¹⁰ Some may even live for several weeks before succumbing to FIP. However, some litters are born alive and when fostered or bottle fed will remain healthy. It is uncertain what role the infection plays in this mortality. Are early fetal resorptions and abortions due to fetal infection from maternal monocyte/macrophages? Are fetal deaths due to non-specific effect of the disease and its associated cytokine storm? It is likely to be a combination of both. However, there is no doubt that some kittens can be infected late in pregnancy, born relatively healthy, and develop confirmed FIP in the first few weeks of life.

The advent of GS-441524 treatment of FIP has had a profound effect on FIP in pregnancy and the fate of affected fetal and neonatal kittens. Queens treated early in their disease will often give birth to healthy kittens and if their response to therapy is rapid, they can care for them in a normal fashion. There have been no studies to determine how much GS-441524 reaches the fetus from the maternal blood stream, but it is a small molecule and should readily pass the placental barrier. It appears that GS-441524 does not have any negative effects on fetal development or normal kittens when it is administered to the queen during the usual second or third trimester, and/or during the neonatal period. GS-441524 is presumed to readily pass from queens to kittens in colostrum and milk.

The current recommendation is to treat pregnant queens as if they were not pregnant and not intervene in the pregnancy or neonatal care unless necessary. Sequential ultrasound exams will give an accurate picture of what is happening to the fetuses. Some will be dead and resorbed in-utero, some weak and aborted, and some normal in appearance and subsequently healthy at birth. Queens usually respond rapidly to GS-441524 treatment and most are healthy enough to nurse and care for their kittens by the time they are born. Other than the actual treatment, queens should be allowed normal interactions with their kittens. The kittens do not need individual treatment as sufficient GS-441524 is presumably provided by the queen's milk. Kittens that are born healthy and not nursed can be fostered or handfed and their weights monitored daily. GS-441524 treatment should only be used if lack of weight gain and inactivity indicate that it might be needed.

References

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