

Viruses and Bacteria and their effects on prenatal and neonatal development

Both, bacteria and viruses can cross the placental barrier and infect the embryo within. The magnitude and severity of symptoms is mostly effected by the time-frame of infection in relation to term week of pregnancy. Viruses and bacteria that infects the bitch in the first 5 weeks of pregnancy are often reabsorbed and are most of the time reported as missed breedings. Infections from 5-7 weeks can cause miscarriages, but in the 5-6 week timeframe most bitches will consume all evidence of miscarriage. Pregnancy is considered full term at 56 days once the suckling reflex is matured, natural birth happens normally at 63 days in the healthy bitch. Bitches that deliver Pre-term, but after the 56 day mark, should be evaluated for possible viral or bacterial infection. The exception to this is with very large litters that may also induce an early labor response.

Even though some viruses are able to cross this threshold, called vertical transmission, this is not a common practice as the placenta does a very good job protecting the embryo from advancing threats by a virus or bacteria by allowing no direct contact with the mothers fluids. What!?! This is because the way a placenta works is more like a parasite than another part of the mothers body. The only place of direct mother to placenta contact is the site of implantation by the umbilical. Here, the placenta takes individual nutrients, broken down to their basic level, from the mother and then is able to move them through the trophoblastic receptors in the placenta. Imagine the placenta is kinda like a toddler who has built a lego fort, but cannot get it over his baby gate to show his mom....the placenta takes the nutrients, like lego's, disassembles them and then passes them through the baby gate (the trophoblastic receptors) to the other side as small pieces that fit through the small holes. Then climbs over the baby gate to then reassemble them either in the same or in a different order, to take them to his mom, the embryo. This Type of sorted and monitored entry to the embryo's environment ensures less risk of a viral or bacterial admission.

Most often, when pregnancy results in abortion or dead full term embryos, it is a result of placental infection at the implantation site within the uterus. When the contact site between the mother and the embryo becomes infected, the placenta illicit a placental defense, much like our bodies inflammation reaction is a primary results of our bodies fighting off an infection by trying to restrict the area of infection, as well as, concentrating the infection to more easily eradicate them from the bodies environment. The placenta will also become enflamed once a virus or bacteria has crosses the boundaries of the contact site, and triggers this response, this inflammation causes restriction in nutrient exchange. Unfortunately, Oxygen is one of the primary nutrients needed and used and the restriction of Oxygen to the embryo is what most often leads to the post-term death. This is also most often the causes of post term neurological problems. Other, later problematic issues, such as kidney failure, heart malformation, or skeletal mutation, may arise at a later date (post-labor) in puppies that have experienced prolonged placental inflammation. This happens because oxygen levels during development directly effect embryo development, so the type of problems associated with placental inflammation will depend on the stage of development that the embryo was in during the lower levels of oxygen.

The most common way viruses and bacteria infect a next generation is during birth during direct contact with the mothers mucus membranes and the freshly broken umbilical cord. Bacterial infection has a 3-5 day incubation period, so puppies exposed during birth will most often exhibit clinical signs of infection during the time frame. While viruses have a 7-10 day incubation period so puppies infected with a virus will exhibit clinical signs durn this time phase. These are the first two of four "humps" that are time-frame specific infections, and have the highest instances of documented post-term puppy deaths. By looking at age of death we can more accurately decipher the underling causes in an effort to prevent the problems in the first place.

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Chapter 3

Infectious Causes of Abortion, Stillbirth and Neonatal Death in Bitches

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Pathogens and the Placental Fortress

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PLACENTA

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PLACENTA (Latin. placenta, from grech, plakus flat cake; synonym afterbirth) — the provisional body which is formed during pregnancy and providing communication of a fruit with an organism of mother.

<http://bigmed.info/index.php/PLACENTA>

Monitoring of the newborn dog and prediction of neonatal mortality

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