

Infertility in older mares

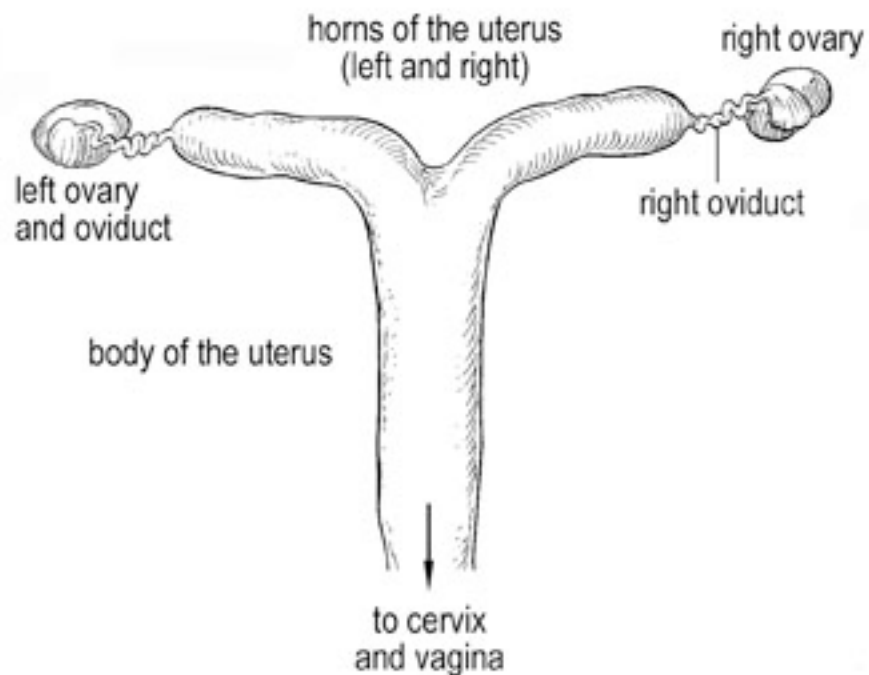
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Mares don't go through menopause, but fertility does tend to decline as they age. I read an interesting article recently which shed some light on why mares in their teens and beyond may fail to conceive when bred to fertile stallions. It turns out that some of these mares have sludge blocking their oviducts.¹

The oviduct

The oviduct, also called the uterine tube (and in women the fallopian tube), is a long, narrow tube which extends from the uterus to the ovary. In mares each oviduct (left and right) is 20–30 cm long, but only 2–3 mm wide for most of its length. At its upper end the oviduct widens into a soft, funnel-shaped structure which gently cups the ovary and catches the ovum, or egg, when it is released from the ovary during ovulation. In effect, the end of the oviduct acts kind of like a catcher's mitt. The ovum then glides down the narrow portion of the oviduct, where it is fertilized if the mare was bred around the time of ovulation.

To fertilize an ovum, the stallion's spermatozoa must make their way through the mare's cervix, across the body of the uterus, up the horn of the uterus, and into the oviduct. In fact, the oviduct is an important structure in terms of stallion fertility, too, because the interaction between the sperm and the oviduct lining is important for the maturation and viability of the sperm, and thus their ability to fertilize the ovum.



Following fertilization, the newly formed embryo spends a few days in the oviduct before it is released into the horn of the uterus. It seems that both the oviduct and the embryo participate in this process. Circular muscle in the wall of the oviduct contracts like a closed fist, preventing the embryo from passing down into the uterus. By around day 5, the embryo starts secreting a hormone, prostaglandin E₂ (PGE₂), which causes the circular muscle in the wall of the oviduct to relax. This same hormone also causes waves of lengthwise muscle contractions in the wall of the oviduct which in effect “milk” the embryo down the oviduct into the uterus.

So, the oviduct is more than just a hollow tube, a conduit for the ovum. It is an active and important part of the process of conception and early embryonic development. Unfortunately, this small organ can cause big trouble for breeders, as it can render a seemingly healthy mare infertile if anything impedes the progress of the embryo through the oviduct.

Blockage of the oviducts

Work with embryo transfer in mares has revealed that it is common for mares to have accumulations of globular material in their oviducts. This material is even found in the flushings of fertile mares. Its origin is still being investigated, but it seems probable that it is mostly the detritus of ovulation. When the mare ovulates, she releases the protein-rich contents of her ovarian follicle into the oviduct. Each follicle is 4–6 cm in diameter by the time it is ready to ovulate, so that's quite a volume of fluid (60–80 ml) and cellular debris entering the oviduct each time the mare ovulates. As the mare ages, more and more of this debris may accumulate, potentially leading to blockage of the oviduct.

Flushing of the oviducts with sterile saline solution has restored fertility to a number of inexplicably infertile mares. However, that procedure is rather tedious. A new technique has been developed wherein synthetic PGE₂ gel is applied to the outer surface of the oviducts, via laparoscopy.¹ The premise is that the PGE₂ relaxes the circular muscle in the wall of the oviduct and stimulates lengthwise muscle contractions, thereby expelling any debris which may be blocking the oviduct.

While it does require special equipment and expertise, this procedure can be done with the mare standing in stocks, under just sedation and local anesthesia. And preliminary results appear to be excellent. In the study I read recently, 14 of 15 previously infertile mares conceived following the procedure, most on the first or second cycle post-treatment.¹

Frankly, though, I'm in two minds about this procedure. On the one hand, it's great that we now appear to have a workable solution for owners of infertile mares who may fit into the category of oviductal failure. On the other hand, perhaps this condition is nature's way of slowing things down; of giving the individual mare a well-earned retirement from breeding and, on a broader scale, ensuring that the species is propagated mostly by the young, healthy females.

Or maybe the truth lies somewhere in between. Perhaps the sludge that builds up in some mares' oviducts is a reflection of the metabolic and inflammatory detritus that accumulates elsewhere in the body over a lifetime, as a result of living in this stressful, polluted world. Perhaps all these mares need is help clearing their sludge.

An alternative to laparoscopy?

Anyway, in amongst all this philosophizing, I got to thinking that there must be a simpler way than sticking a scope into these mares' flanks just so that we can apply some gel to their oviducts. An earlier study failed to show any significant effect on fertility when PGE₂ gel was administered directly into the uterus via the vagina, so that option seems to be a bust. Enter one of my favorite herbs for horses: raspberry leaf.

Raspberry leaf is one of those time-honored herbal remedies for “women's trouble”—menstrual cramps, excessive bleeding, tendency for miscarriage, uterine cramping during pregnancy, either premature or prolonged labor, and for cleansing the uterus after giving birth. (At the risk of breaching the TMI barrier, I can personally attest to the soothing properties of a nice hot cup of raspberry leaf tea for menstrual cramps.)

There is even some scientific research which validates raspberry leaf as a uterine relaxant. By the way, it has the same effect on the intestinal tract, so it can be useful for mild intestinal cramping and diarrhea, too. Raspberry leaf also is rich in antioxidants, so indirectly it has some anti-inflammatory properties, and it contains an abundance of vitamins, minerals, and other nutrients. For these reasons, and because horses like it, raspberry leaf is one of my favorite nutritive herbs for horses. I often include it in my herbal blends for horses, regardless of gender or reproductive status.

To date, there has been no research published about the use of raspberry leaf in horses. However, centuries of use in folk medicine and increasing use in modern horsekeeping indicate that it is a gentle herb which is safe to use in horses, even during pregnancy. Some breeders and mare owners have found that feeding raspberry leaf in the last 4–6 weeks of pregnancy can help smooth out labor and help the postpartum uterus involute (clean itself out and return to its normal size and shape).

As the oviduct is an extension of the uterus and it contains the same types of muscle found in the walls of the uterus and intestine, I'm thinking that raspberry leaf may be useful in infertile mares with oviductal failure. If it is indeed an effective smooth muscle relaxant, then it could act in a way similar to the PGE₂ gel, at much less cost, effort, and risk to the mare. Of course, it remains to be seen whether it is effective and, if so, at what dosage. But wouldn't it be cool if it worked! As it goes in the "worst it'll do is nothing" category, I'm inclined to try it before signing a mare up for the laparoscopic technique.

I should finish by saying that infections of the uterus (endometritis) and degenerative changes in the uterine lining (endometrosis) are far more common causes of infertility in mares than is oviductal failure. It is important to go the conventional diagnostic route in any mare who fails to conceive, and investigate the infectious and degenerative possibilities first. It should go without saying that fertile semen is essential for successful breeding, so that angle needs to be explored, too, before settling on a diagnosis of oviductal failure.

Reference:

1. W.R. Allan, S. Wilsher, L. Morris, et al. "Laparoscopic application of PGE₂ to re-establish oviductal patency and fertility in infertile mares: a preliminary study" *Equine Veterinary Journal*, 2006; vol. 38, no. 5; pp. 454-459.

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This article was first published in Horses Incorporated (www.horsesinc.net)