



ISSN: 2456-2912
VET 2019; 4(6): 01-04
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www.veterinarypaper.com
Received: 01-09-2019
Accepted: 05-10-2019

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Retention of foetal membrane in mare

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Abstract

Retained foetal membranes (RFM) is one of the more commonly encountered postpartum complication associated with equines, occur following abortion, prolonged gestation, twinning, dystocia, fetotomy, and caesarean section along with a predisposition of genetic, nutritional, managerial and breeding factors. Range of RFM between 2 and 54% in foaling. RFM in mare is considered after 8 to 12 hours of foaling with possibly complication like colicky pain, slow release of placenta, anorexia, septicaemia, toxoemia, laminitis even up to death of the mare. Diagnosis revealed by history, clinical observation like hanging of part of placenta from vulva, CBC and other biochemical parameters. Treatment of RFM is done most popularly by oxytocin along with broad-spectrum antibiotics. Intrauterine treatment and uterine lavage are also practiced. Manual removal also preferred by some practitioners. But manual removal has lots of controversy due to complications like haemorrhage, uterine horn invagination, delayed uterine involution, pulmonary emboli, and permanent endometrial damage followed by sterility.

Keywords: Retained foetal membranes (RFM), foaling, placenta, oxytocin

Introduction

RFM is defined as the complete or partial failure to release the chorioallantois within a pre-defined timeframe post-partum. The duration of time before the membranes are considered to be retained varies widely from 30min to up to 24hours. Retained foetal membranes (RFM) after foaling have been reported to be more likely to occur following abortion, prolonged gestation, twinning, dystocia, fetotomy, and caesarean section. It has been postulated that mares bred at foal heat or mares which have developed uterine or systemic infection before or during pregnancy were prone to retained foetal membranes. The incidence of RFM and puerperal infections may increase with age, excessive fatigue, poor condition, or poor environment. Retained foetal membranes have been regarded as a threat to the uterine health and general health of the mare. The reported sequelae of RFM range from none to metritis, laminitis, septicaemia, and death. Manual removal was the most commonly described treatment for RFM in the mare. Following manual removal, systemic or local antimicrobial therapy was administered along with active or passive immunization against tetanus. Oxytocin therapy was recommended within 12 hours after delivery. If hormonal therapy failed, the RFM was to be removed manually or allowed to detach naturally.

Incidence

Retained placenta in the mare is much less common than in cow. Jening reported that RFM more commonly accompanied the large draft foals than the light horse foals than are Thoroughbred mares. RFM is less common in mares because of simple, diffuse type of placentation and strong uterine contraction aiding the separation of the villi from their maternal crypts and expelling the detached membranes. This condition reported to occur with a frequency of 2 to 10.5% in draught horses Allen. The incidence of RFM is difficult to assess because of a lack of a specific postpartum time interval in the definition, but has been reported to range between 2 and 54% in foaling. The incidence of RFM in mares vary from breed to breed. The incidences of RFM occurring in Thoroughbred were 5.2 and 4.0%, for over 3 and 4 hr after foaling, respectively. These rates are markedly lower than those of other heavy breeds: 27.6% for heavy draft for over 4 hrs after foaling, and 54% for Freisian for over 3 hrs after foaling.

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Predisposing factors of Retained Foetal Membranes

1. **Abnormalities in delivery:** Dystocia was associated with a higher incidence of RFM than normal delivery. Abnormal deliveries without dystocia (e.g. abortion, stillbirth, twinning) were not associated with a significantly higher incidence of RFM than normal deliveries. Mares which delivered twins (with and without dystocia) also did not have increased incidence of retained foetal membranes. Williams reported RFM in the mare is likely to occur following abortion and prolonged gestation.
2. **Weak or diseased Foal:** Delivery without dystocia of a live but weak or diseased foal was not associated with increased incidence of RFM when compared with normal delivery of a healthy foal.
3. **Age:** Mares over 15 years old had a significantly higher incidence of RFM than mares under six years of age.
4. **Season:** Higher incidence of RFM after March than during January, February and March.
5. **Sex of foetus:** The normal delivery of a colt was not followed by a higher incidence of RFM than the normal delivery of a filly. The sex of the foal did not influence the incidence of RFM. This differs from the cow where an increased incidence of RFM was observed after delivery of a male calf
6. **Previous history of Retained Foetal Membranes:** Mare have a previous history of RFM show high incidence of RFM in next foaling. There was a threefold increase in mares which experienced RFM the year before.
7. **Breeding history:** Inbreeding has also been shown to play a role in the high incidence observed in Friesian mares. Natural breeding might be associated with greater contamination of the reproductive tract, hence a higher incidence of uterine infections and subsequent development of abnormal uteroplacental attachment. Such attachment might predispose to retained foetal membranes. Repeated breeding during one heat period or breeding of infected mares or infected stallions may cause RFM.
8. **Genetic factors:** Recurrences of RFM were observed after consecutive normal deliveries suggesting that certain mares had a predisposition to retained foetal membranes. Mares with recurring RFM might have different hormonal profiles at foaling, accounting for their inability to expel the foetal membranes soon after delivery of the foal. Abnormal uterine contractions may also play a role. Another explanation would be that mares with recurring RFM have developed adhesions between the uterus and the allantochorion following uterine infections. These infections could recur year after year due to conditions like poor conformation of the vulva or early reopening of Caslick closure prior to parturition.

Causes of Retained Foetal Membranes

The cause of RFM is not known for certain, but a combination of uterine inertia and hormonal imbalances has been suggested. Other causes that have been reported include serum calcium and phosphate imbalances, dysregulation of extracellular matrix remodelling and activation, physical intervention, placental infection, and/or oedema, trauma to endometrial tissue and uterine infections. Pre-disposing factors for uterine inertia include low blood calcium levels, overstretching of the myometrium due to twins, myometrial degeneration due to infections, and myometrial exhaustion in the course of dystocia. Hormonal imbalances have been

attributed to low oxytocin receptor expression. Retention of the placenta occurs most commonly at the tip of the non-pregnant horn, probably due to the greater connection of the microvilli (microcotyledons), compared to the swollen pregnant horn where the microvilli are more compressed and smaller.

Clinical signs and symptoms

Physiologically the foetal membranes are expelled within 0.5 to 3 hours after foaling but it is fairly common to have the foetal membranes not drop away until 8 to 12 or more hours later without any observable symptoms of illness. Arthur stated that strong uterine contraction in the mare after foaling and just before expulsion of the placenta are often accompanied by signs of abdominal pain, recumbency and colic. The mares that retained their afterbirth exhibit no such pains and appear normal, content, eat and drink, and suckle their foals. Slow expulsion of placenta may be due to uterine inertia or exhaustion following expulsion of the foetus. The onset of delayed expulsion is indicated by the mares developing colicky pains followed by dropping away of the membranes in from 10 to 20 minutes. In some nervous mares it is necessary to tie up or cut off the hanging retained placenta so that it will not frighten the mare into kicking and otherwise possibly injuring the foal. Retained foetal membrane can usually be observed hanging from the vulva. Occasionally the placenta may partially fall away and apex or tip of the placenta will remain in the nongravid horn especially if the apex is thickened and oedematous, Prickett. The weight of the placenta or the mare stepping on it may rip it away, leaving the tip of the nongravid horn in the uterus. This piece of placenta may act as a focus of infectious often resulting in a severe metritis and secondary laminitis the third to seventh day after foaling. The after birth of each mare should be carefully examine after if fall away, to make certain no portion of the placenta remains in the uterus. Most case of laminitis occurring after foaling are due to metritis often associated with a portion of placenta being retained and floating in a uterus filled with fetid fluid. Uterine invagination or intussusception, usually of the nongravid horn into the uterine body, may accompany retention of foetal membranes in the mare but it is seldom of a serious nature, Heatley and Fincher.

Diagnosis

Complete or partial (commonly of the non-foetal horn) foetal membrane retentions are usually diagnosed by visual observation of foetal membranes protruding from the vagina, vaginal palpation, and/or clinical signs such as colic. Further diagnostic tests may be indicated to evaluate the state of the patient, particularly regarding a developing septicaemia. Potential complications include toxic metritis, septicaemia, endotoxemia, laminitis, and possibly death. Blood tests [complete blood count (CBC), biochemistry, and fibrinogen] were the most popular additional diagnostic tool used. A physical exam of the horse and vaginal palpation were other commonly performed tests. Some practitioners considered a physical exam on the foal as well as an IgG-test to be important if the membranes were retained for a "particularly long" period.

Treatment and management

The main aims of treatments are to eliminate toxic and inflammatory products from the uterus, control systemic

shock symptoms and endotoxemia, and prevent laminitis. There are various treatment protocols manage the RFM.

- **Managemental aspects:** As the non-infectious causes of RFM is multi-factorial and difficult to be diagnosed, so special care should be paid for control measures rather than treatment protocols. 1) The foaling facilities and hygiene should be optimal, thus reducing the incidence of puerperal infections; 2) foaling assistance should be provided by skilled staff. 3) Mares should be bred by AI near ovulation. 4) The genetic aspect should be put in consideration to select the animals having the minimal probability for occurrence of RFM.
- **Nutrition:** Supplementation with balanced vitamin and mineral mixture in prepartum period is considered a prophylactic step to avoid RFM.
- **Manual removal with or without antibiotics:** The portion of placenta hanging outside the vulva is hold with one hand and placenta is twisted gently in a rope fashion. The other hand is carefully introduced along the twisted placenta to the area of attachment in the uterus between the placenta and endometrium. The tip of the fingers are pressed between the endometrium and chorion and the villi are detached, as the allantochorion gradually freed it is taken up by further twisting of the detached mass.
- The most recent technique for manual removal consisted of introducing a large amount of diluted antiseptic (9-12 litters) into the allantoic cavity kept closed at the cervical star. The chorioallantois and its fluid content were pushed out by the expulsive efforts of the mare. This technique was described as less traumatic than manual separation of the placenta.
- This is the most controversial treatment. Several publications recommend manual removal of the membranes suggesting a quick resolution of the condition. Other authors oppose this practice due to the increased chance of absorption of septic/toxic materials and delayed uterine involution. Possible complications include haemorrhage, uterine horn invagination, delayed uterine involution, pulmonary emboli, and permanent endometrial damage followed by sterility.
- The administration of broad-spectrum antibiotics to all mares experiencing RFM is often recommended to prevent bacterial growth in utero and secondary septicemia/endotoxemia. A combination of beta-lactam antibiotics (e.g., penicillin) and aminoglycosides (e.g., gentamicin) covers most of the common pathogens found in the equine uterus.
- **Intrauterine therapy and uterine lavage:** Intrauterine administration of oxytetracycline starting 8h post-foaling is one the effective treatment option. Uterine lavage can be carried out prior to or after RFM expulsion. Small pieces of membranes remaining in the uterus can be flushed out by uterine lavage. It is thought to help to physically remove bacteria and cell debris, stimulate uterine contractility and attract neutrophils to the uterus. Several lavage fluids and techniques have been described. One well-known technique is the "Burns Technique" involving the introduction of large volumes of lavage fluid into the allantoic cavity followed by the manual occlusion of its entrance for 10–15min (18). Lavage is usually repeated until the returning fluid is clear. Some authors recommend the use of antiseptics in the lavage fluid, but this may cause severe uterine irritation. Ringer's solution, isotonic saline, and tap water are all routinely used for uterine lavage.

- **Hormonal therapy with or without antibiotics:** Oxytocin is considered the most important initial treatment by most respondents. The most commonly reported doses were 20 international units (IU) and 10 IU administered as IM or IV injections. The most commonly reported frequency of oxytocin treatment ranged from 30min to 2h intervals. A lot more respondents use high doses of oxytocin often administered in a bag of fluids. Of the respondents that administer oxytocin again, administer doses up to and in excess of 80 IU. The most common route of administration at this point in the treatment was in a 1l bag of lactated ringers' solution over 45min. oxytocin with antibiotics like procaine penicillin G, dihydrostreptomycin i.m. daily for 5 days have a better result.
- **Additional therapy:** Additional treatments include non-steroidal anti-inflammatory drugs (NSAIDs) used against inflammation, endotoxemia, and pain. Tetanus toxoids or anti-toxins and IV fluid therapy are also highly recommended. Laminitis prevention includes ice boots, NSAIDs, and pentoxifylline administration. Some advocate the use of stilbestrol, 30 to 60 mg., or estradiol, 3 to 6 mg., and ergonovine, 1to 3 mg., intramuscularly daily for several injections.

Conclusion

Although the incidence of RFM is low in mare than cow, but it is a great complication of postpartum mare. As mare is very prone to septicemia, toxemia and tetanus thus early diagnosis and prompt treatment of RFM should be practiced otherwise it may affect the future reproductive life of mare. According to various practitioners and clinicians this great problem can be treat by oxytocin along with broad spectrum antibiotics, NSAID, antihistaminic and some supportive treatment. Some controversial treatment like manual removal also practiced by some practitioners. Proper management, nutrition, breeding may also help to prevent this complication after foaling.

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