

PERIPARTUM UROGENITAL DISORDERS IN MARES

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ABSTRACT

Disease processes in peripartum period can adversely affect a mare's future fertility or, worse, may be life threatening to her or her foal. An additional unique set of differential diagnosis must be considered in the mare at this time, along with all the most common diseases. So, this review emphasizes the disorders that affect the mare's and foal's health on peripartum period.

Keywords: peripartum, postpartum, disorder, equine, theriogenology.

TRASTORNOS UROGENITALES EM PERIPARTO EN YEGUAS

RESUMEN

Los procesos de la enfermedad en el período perinatal pueden afectar negativamente a la fertilidad futura de una yegua o, peor aún, puede ser potencialmente mortal para ella o su potro. Un conjunto único adicional de diagnóstico diferencial debe ser considerado en la yegua en este momento, junto con todas las enfermedades más comunes. Por lo tanto, esta revisión se hace hincapié en los trastornos que afectan la salud de la yegua y del potro en el período periparto.

Palabras clave: perinatal, posparto, trastorno, equino, reproducción.

DESORDENS UROGENITAIS NO PERIPARTO DE ÉGUAS

RESUMO

Os processos de doença no período do periparto podem afetar negativamente a fertilidade futura da égua, podendo até ser fatal para ela ou para seu potro. Um conjunto de diagnóstico diferencial deve ser considerado nesse momento, juntamente com todas as doenças mais comuns. Assim, esta revisão enfatiza os distúrbios que afetam a saúde da égua e do potro no período do periparto.

Palavras-chave: perinatal, pós-parto, desordens, equinos, reprodução.

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INTRODUCTION

The peripartum is defined as the period right before, during or immediately after the foal is born which occurs in mares from 320 to 360 days (340 days on average), and from 315 to 350 days of pregnancy (333 days on average) in ponies (1). The impact of maternal and placental disorders in the uterine environment results in fetal and neonatal distress mainly related to hypoxia, infection and disruption of the uterine development. The consequences of a maternal compromised pregnancy can vary from premature interruption of pregnancy to medical problems that may interfere with maternal health and the ability to maintain a future pregnancy to term (2).

The owners often seek veterinary care in emergencies such as peripartum dystocia, prolonged gestation and newborns at risk. Signs of abortion represent a diagnostic dilemma because of the difficulty in differentiating between normal uterine contraction and other sources of abdominal pain (3-5). Thus, this review aims to assist in early diseases identification affecting the peripartum mare's performance and thus helping in front of a perinatal crisis.

DYSTOCIA

In dystocia, the life of the neonate and mother may have their potential compromised (6). In horses the dystocia incidence is 1-10%, considered low when compared to other species. In 'normal sized' horses the dystocia prevalence is minimal and around 4%, however in small breeds (e.g. Shetland) and heavy draft horse breeds, dystocia might vary from 8 to 20% (7, 8). Morley and Townsend (9) reported that only 6% of deliveries needed help and these only 4% veterinary aid. The main and most frequent cause of peripartum complications is the assistance failure to obstetrical dystocia (10).

The methods for resolving dystocia include: assistance to vaginal delivery, controlled vaginal delivery, cesarean section and fetotomy (6). Much of dystocia can be resolved with care and vaginal delivery control, but alternatives must be developed in cases where resolutions are not possible in 10 to 15 minutes. These decisions should be based on the foal viability, the obstetrician ability, equipment availability/facilities and financial restrictions imposed by owner (11).

Dystocia is often accompanied by uterine inertia and followed by uterus involution failure, usually occurs fetal membranes retention, puerperal metritis, especially for horses that are often followed by laminitis, embolic pneumonia, toxemia, sepsis and pyometra. Endocarditis, poor performance and sterility are possible uterine infection sequelae. Therefore, all obstetric interference must be accompanied by prophylactic injections against tetanus (10).

PROLAPSES

Vaginal prolapse may occur during forced traction to conduct dystocia, eutocic expulsive phase or coincident with contractions, resulting from irritative processes, inflammatory or excessive manipulation. Mucosa inversions, and total or partial cervix prolapsed should be differentiated of vaginal mucosa projections bulging through the vulva, that can be observed in young animals and, in most cases, it is the imperforate hymen membrane (12).

Complete uterine prolapse in the mare may be associated with age, vaginal delivery, dystocia, and often the abortions between 8 to 10 months of gestation, manifesting itself immediately or several hours after the product expulsion. Conditions that cause strong

tenesmus (e.g., vaginal injury) combined to uterine atony can predispose to uterine prolapse (13, 14). The uterus intussusception occurs when the uterine involution process at the end of the horn is reversed and becomes trapped within the lumen by a ring of myometrial spasm, may also progress to a complete uterine prolapse (15).

The aggravating it is possible when have a rectal prolapse association, bladder protrusion, uterine rupture, placenta retained and bowel herniation (15), and are complicated by internal uterine vessels rupture, entrapment, ischemia of the organs, shock and death (16, 17).

Rectal prolapse is a common consequence in mares due to the force exerted to expel the fetus. If the prolapses occur during foalbirth, the rectum can be repositioned, and an assistant is instructed to keep the organ in place by means of pressure. If the repositioning a commom after delay, prejudice the procedure (10).

The animal may show signs of pain, tenesmus, anxiety, increased heart rate, breathing, and prostration. Hemorrhage and hypovolemic shock may occur in cases of excessive endometrial damage or large vessels uterine rupture (16). This is an obstetric emergency requiring prompt and decisive action work. The future fertility of affected animals and treated successfully will depend on the endometrial degree damage and therapeutic procedures (12).

The treatment requires anesthetic protocols knowledge, handling the organ delicate to restitution in original anatomical position and the complete removal of the causative agent (12). The uterus should be raised at the level of the pelvis in an attempt to restore circulation, reduce congestion and lessen the ovaries pull and uterine ligaments. The uterus rising also allows the bladder back into its normal position, facilitating the intestine extrication and reducing the chance of the broad ligament rupture vessels. The endometrium exposed must be washed with germicidal solution and the fetal membranes that were detached easily be removed for a better lesions extent assessment, if present must be repaired before the repositioning (16), where the uterus is already showing gangrene signs should evaluate the surgery amputation possibility (18). The use of hypertonic saline with or without glycerin or a hypertonic solution (15) and cold water can be helpful in reducing edema. To manual reduce a prolapsed organ, it is necessary to put a hand into uterine lumen, the use of the fingertips should be avoided (19), over the uterus with a plastic reduces the uterine wall chance of rupture broad ligament risk (20). After inversion correction, the uterus should be washed with warm sterile saline solution to stimulate involution, reduce contamination and promote uterine distention of the organ to the hornends (15).

If the bowel were imprisoned in uterine prolapse, one should evaluate the possibility of performing in the midline ventral celiotomy. If the bladder is distended catheterization or puncture may be needed before repositioning the uterus (21, 22).

The treatment should be associated with supportive therapy, including intravenous fluid therapy, broad-spectrum antibiotic, anti-inflammatory, anti-tetanus prophylaxis, ecbolics drug and intrauterine therapy. Some clinicians suggest the use of vulva suture for prolapse not recidive (16).

The reproductive prognosis is good depending on the endometrial commitment degree, so before new pregnancies is recommended culture and uterine biopsy and subsequent periodic assessment of gestation, mainly on the delivery eminency (16).

PLACENTA RETENTION

Retained placenta is the most common problem on the equine post-partum (23) and may occur in 2-10% of normal deliveries (24, 25) with higher incidence in mares over 15 years (25).The fetal membranes are normally expelled within 1 to 2 hours after delivery, if not

occurring is considered as retained placenta. This is an emergency clinic in the field requiring immediate veterinary care (26).

The placental separation mechanism is not well understood. The delivery in the mare is preceded by the final uteroplacental junction maturation and the principle of microcotyledonary separation (23). The separation of the fetal and maternal placenta should not be completed until the foal is able to hold its own oxygen. There is collapse of the portion and subsequent retraction of fetal chorionic villi when there is the umbilical cord rupture. Uterine contractions, beginning at the apex uterine horns and progressing to cervix, reduce the uterus size and the blood circulating volume in the endometrium, which facilitates the separation in fetal and maternal portion. The chorioallantois reverses and rolls inside, thus pulling the chorionic villi of the endometrial crypts. Any disturbance in the initiation and course of this cascade of events may cause placenta retention.

The fetal membranes retention appears to be associated with the non gravid uterine horn ends (14). One possible explanation for this is that microcotyledons are more profoundly attached in this region and chorioallantoic thinner (27), whereas they tend to be slightly tapered and withered at the end of the gravid horn (28). Thus, it is likely some dysfunction in the endocrine process of microcotyledons maturation. The pathophysiology of the fetal membranes retention on mare has yet to be determined; however Sevinga, Barkema and Hesselink (29) demonstrated a significant decrease in serum calcium and Welle, Audige and Belz (30) reduced the number of mast cells in endometrial postpartum period in mares that retained placenta. Disturbances in uterine contractions can also result in fetal-maternal endocrine dysfunction and inadequate oxytocin release or inadequate myometrium response to oxytocin released (24, 27).

Some factors and events may predispose the mare to retained placenta, abortion, dystocia, placentitis, twin gestation, uterine inertia and cesarean. Mares that conceive in dirty and contaminated environments suffer the reproductive tract contamination risk with bacteria that can cause metritis, septicemia and laminitis (31). Rapid autolysis of membranes promotes a favorable environment for bacterial replication. Thus the endometrium is commonly affected and the uterus is inevitably contaminated. If a severe metritis develops inflammation of the uterine wall allow bacteria and toxins from reaching the systemic circulation, producing septicemia and endotoxemia (32, 33). Laminitis is a frequent consequence (19).

The retained placenta diagnosis is simple when the placenta is visible within the vulva, but becomes complicated in cases where only a small part of the placenta was retained, usually in the most cranial uterine horns. So once again it is recommended a thorough examination of the placenta to identify areas that are possibly trapped in the uterine lumen (31).

Some mares can hold the membranes of four or five days without showing signs, while others in 24 to 48 hours may develop fever, endometrosis, abnormal vaginal discharge, endotoxemia, depression, lameness, dehydration, anorexia, tachycardia, decreased of milk production and mucosal changes. Card (34) reports that metritis is most evident in mares housed when compared to mares loose or that have access to regular exercises.

The ideal method for retained membrane removal is not well established. The most common is the oxytocin use; however Sevinga, Hesselink and Barkema (35) demonstrated that the combination of calcium borogluconate and oxytocin is more effective in the treatment, the low levels presence of calcium in the first 12 hours postpartum in mares retained placenta. There are reports of collagenase injection by umbilical artery (36) and chorioallantoic distention with saline solution (19, 37). The exact mechanism of these treatments is unknown, but the uterine lumen expansion may extend the endometrial crypts and the weight of the membranes may loosen the microcotyledons automatically promote the membrane expulsion in 5-30 minutes. According to Vandeplassche, Spincemaille and Bouters

(24), this technique activates stretch receptors, followed by endogenous oxytocin release and chorionic villus separation of endometrial crypts.

Manual removal is contraindicated due to the placentation type in the mare (epitheliochorial and adeciduade) (38), which means that the fetal membranes expulsion involves minimal loss of endometrial epithelium and probably this explains the reason for which the equine uterus can sustain a new embryo two to three weeks after delivery (39, 40). When the membranes are extracted forcibly can result in small parts of the chorioallantoic epithelium retention (31), as well as uterine tissue suffering trauma and become more susceptible to bacteria invasion and metritis development (33). Undue traction of the membranes may also cause an uterus's top reversal which may progress to a complete uterine prolapse due to (19). However, according to Sevinga, Barkema and Hesselink (29) no difference was found in reproductive performance (pregnancy in foal's heat and delivery rate) between mares with retained fetal membranes, with or without manual removal and mares with placentas expelled normally.

If the placenta is considered retained, therapy with nonsteroidal antiinflammatory and broad-spectrum antibiotics should be instituted for the metritis, septicemia and laminitis prevention. The mare should receive fluid and established tetanus prophylaxis. The exercises are recommended, as they collaborate in the lochia elimination and uterine involution (31). The uterine lavage with warm saline should be repeated until the liquid that returns are relatively clear. The goal of therapy is to eliminate toxins and prevent the rapid bacteria proliferation. However, intrauterine administration of antibiotics is controversial, these drugs may reduce the uterine phagocytic and neutrophils activity and many drugs have the property of irritating the endometrium (38, 41) associated with this there is a lack of antimicrobial activity by the presence of a large bacteria population and cellular debris associated with fetal membranes retention (42).

TRAUMA AND RUPTURE OF THE URINARY BLADDER

Red globular formations projecting the vulva, followed by expulsive efforts should be carefully analysed and treated to eversion, the urinary bladder prolapse and rupture (12).

The urinary bladder traumas and the eversion is the most common in mares (18). On these cases the urinary bladder was exteriorized through the urethra, which mares are particularly short and highly distensible, especially at delivery. Careful inspection allows defining the inner bladder lining and the ureters with urine dripping. Lubrication and epidural anesthesia can facilitate the organ repositioning. The mucosal surface should be thoroughly cleaned and any damage must be repaired. The reduction is by manual suture and the urinary sphincter is the treatment of choice (43). Should be used broad-spectrum antibiotics and nonsteroidal anti-inflammatories and tetanus prophylaxis (44).

On prolapsed cases, the bladder passes through a break in the pelvic floor that can occur during vaginal delivery in general and the urethra is obstructed urinary bladder remains distended, for the replacement of the organ is necessary to drain the urinary content and subsequent suturing of the vaginal floor (45).

A ruptured bladder may occur due to trauma in eutocic, dystocia or a large increase in intra-abdominal pressure during delivery (46-48). The clinical signs are the same shown during electrolyte imbalance, lethargy, anorexia and failure in urination. Clinical examination reveals tachycardia, tachypnea, and decreased gastrointestinal activity (22). A cystoscopy should be used to assess the location and extent of the injury. Nyrop and coworkers (46) described the presence of calcium carbonate crystals in the peritoneal fluid mares with ruptured bladder. Once the mare is stabilized, the surgical repair is indicated (46-49).

RECTOVESTIBULARES AND PERINEAL INJURIES

The retovestibulares and perineal injuries do not usually lead to death, but may lead to infertility if not repaired on time (31). Lacerations may be superficial or deep, punctual or linear, or contained extensive and potentially occur in any segment of fetal route (12).

Simple defects of vulva conformation, effective length, angle or inclination, inclusion or juxtaposition of the lips, resulting or no of perineal injuries are sufficient to cause subfertility or infertility. The vulva defects allow air to pass featuring pneumovagina, evidenced also by aspiration sound emitted when the animal get around (12).

Partial or total adhesions of the vagina tubular wall are capable being recorded, especially in animals not subjected to gynecological examination consistent postpartum laborious. Moreover, the vaginal vestibule and the external urinary meatus need special attention. At this site, the transverse fold and remnant of the hymenal membrane, which can display varying degrees of impairment as a result of dystocia. In the presence of serious injury to determine their detachment from the lateral-inferior wall of the vagina or when there is extensive tissue loss, inevitably there will be urine reflux into the vaginal background, featuring urovagina. Concurrently vaginitis, urethritis and cystitis can be established (12).

The necrotic vaginitis is a condition of postpartum mare often detected only during the foal heat, but it is mainly the vaginal lacerations result caused by the foal hooves at birth, especially births in which the foal remains too long in the vaginal canal, dystocia, or where there is not adequate relaxation and vaginal lubrication. This condition is more common in mini breeds and donkeys. The animals are lethargy, depression, anorexia, weight loss and a nodular structure in general, blackish green granular staining is palpable in the vagina that may or may not resolve spontaneously. Through vaginal swab can be done to establish culture and antibiotic treatment, this condition requires monitoring, because the decrease in the size of the vestibule may be due to scar formation (31).

Lacerations occurred in the outer portion of the female reproductive tract are classified as first, second or third degree in a progressive sequence of severity. First-degree involve a degree of mucosal injury of the dorsal vaginal vestibule and the upper portion of the vulva, including the skin with minimal muscle damage. Second-degree lacerations include vulvo-vestibular muscles disruption, especially the perineal body, preserving the floor integrity of the rectal and anal sphincter. In third-degree lacerations, there is the division of traumatic dorsal wall of the vagina, rectum floor, anal sphincter and perineal body, with consequent tissue loss. The feces pass passively invading the vaginal area (12). The main clinical consequences of a third degree laceration are pneumovagina and vaginal contamination with fecal fluid, and fecal accumulation in the terminal segment. These facts result in bacterial contamination and ascending infection of the genital tract (10).

Often the severe lacerations affect primiparous, but there are factors such as the fetus with members crossed over the neck, animals with congenital narrowing vulvar, mares that were previously submitted to vulvoplasty and animals that had shown previous laceration during delivery, because is expected slight luminal stenosis due to tissue loss and scar retraction (12).

In some situations the ruptures are located, featuring recto vaginal fistulae, consisting of variable orifice diameter, communicating both anatomical pathways. May allow the feces passage or fecal broth, and detected in the vaginal canal. It is clear that reproductive impairment may worsen during estrus, when cervical physiological relaxation occurs, allowing the contaminant in the uterus. Dystocia of fetal cause or sudden movements of the members in the birth canal are responsible for this accident (12).

The rectal palpation, uterus ultrasound evaluation, vagina speculum examination and perineum observation should be performed throughout mare injured after delivery. The

diagnosis is simple with the genitalia and vagina external examination. The uterine biopsy may be recommended in older animals, in order to identify and eliminate the surgical procedure from mares that will be unlikely to conceive. Other factors should be considered before surgical correction includes age, reproductive history, and if the use of reproductive biotechnologies such as artificial insemination and embryo transfer is permitted to breed (15).

Complete lacerations, injured severe, need cared from technicians and farmers until the wound appearance. Surgery is delayed for 4 to 6 weeks following the laceration to allow wound contraction and inflammation to subside. Delaying surgery for this period allows the wound edges to strengthen and become clearly defined before repair is attempted (50). Exceeding the period of 12 hours the site should be treated as an open wound, using products free from irritating factors until the complete vaginal and rectal mucosa regeneration, which may take 30-60 days, when it will be possible to perform reconstructive plastic surgery (12). The immediate care is to treat the injured tissue with cleaning, nonsteroidal antiinflammatory drugs administration, antibiotics and tetanus toxoid. Some mares may have constipation due to local pain, a diet that facility the fecal such changes softest stool can prevent digestive disorders (31). If trauma is present ventral catheter can be inserted to check the urethra integrity (4, 51).

The surgical treatment varies depending on the injury severity and should not be made until all the inflammation of the injury is resolved (15). The basic technique of treatment for perineal repair defects was pioneered proposed by Caslick (52) and Göetze (53) and modifications are made by many authors to the present day. All technical proposals aimed at restoring between rectum and vestibule and restoring the perineal body function (15).

The postoperative complications include: the feces retention due to pain, suture dehiscence by contamination or pressure from constipation, thrombosis with subsequent necrosis, rectal prolapse, urinary bladder eversion and infertility. The latest sequelae may be uterine contamination suffered by the feces presence from the birth moment until the surgery (12).

The reproductive prognosis is good since the treatment is done on time and with proper technique (31). Zent and Pantaleon (15) reported a 75% conception rate after surgical repair of affected mares.

FINAL CONSIDERATIONS

The pregnancy disorder identification in the mare requires a careful collection of medical data and reproductive past and present in addition to a rigorous physical examination, general and specific reproductive tract. A good interpretation of these data can prevent or minimize a condition in the peripartum mare and therefore result in a viable foal and a mare with good reproductive capacity for future pregnancies.

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Recebido em: 17/06/2013

Aceito em: 12/11/2014