Strangulation obstruction of the small intestine in horse

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Abstract

Equine colic is a relatively common disorder of the digestive system and should be treated as an emergency. A twist in the small intestine of a horse cause the blood supply to be cut off, resulting in necrotic tissue. The aim of the study was to describe associations between prognostic indicators and diagnoses in equine colic caused by strangulation obstruction of the small intestine. Signs of abdominal pain included: agitation, excessive sweating, flank watching, pawing, frequent lying down, kicking at the abdomen, rolling, tachycardia, absence gut sounds, presence tympanic sounds, abdominal distension, lack of defecation, playing in the water bucket but not drinking and abnormalities at rectal examination. Flunixin meglumine and xylazine were used in every colic case to help control the abdominal pain. Volvulus/torsion of the small intestine resulted in severe pain was difficult to relieve with analgesics. A nasogastric tube was used to relieve the amount of gas pressure in the gut, giving gas and fluids an avenue to travel away from the gut. IV fluids were necessary for dehydrated or in shock horses. Progressive pain with poor response to medical intervention, lack of fever and serosanguineous peritoneal fluid were clinical features that helped distinguish strangulating lesions of the small intestine from simple obstructions and enteritis. Finally horses were euthanized due to grave or poor prognosis. Strangulating obstruction of the small intestine is one of the most lethal forms of equine colic. Minimization of colic episodes depends on management factors, including feeding large quantities of forage, minimizing the amount of concentrate fed and ensuring adequate parasite control.

Keywords: equine colic, small intestine, serosanguineous peritoneal fluid

Introduction

Strangulation obstruction of the small intestine is characterized by simultaneous occlusion of the intestinal lumen and its blood supply inducing rapid deterioration of the intestinal mucosa and subsequent onset of endotoxemia (Blikslager and Marshall, 2015). Any segment of the small intestine may be involved, the distal jejunum and ileum are most frequently affected, most likely because the mesentery is longer in the more distal bowel. Horses have moderate to severe signs of abdominal pain that is only intermittently responsive to analgesic medications (Blikslager, 2010). During the latter stages of the disease process, horses may not experience much pain but rather become profoundly depressed as affected intestine necroses. The prognosis for survival in horses with small intestinal strangulating obstruction is generally lower than with most other types of colic (Blikslager and Marshall, 2015). Treatment includes resection of devitalized bowel, which may not be an option because of the extent of small intestinal involvement. The aim of the study was to describe associations between prognostic indicators and diagnoses in equine colic caused by strangulation obstruction of the small intestine.

Materials and methods

In clinics of our faculty, during the last 2 years (2016-2017) were presented 5 horses mixt breed, 7-14 years old with abdominal distention and severe colic lasting about 2-3 days. They were dewormed with fenbendazole. Previous treatment with antispasmotic and nonsteroidal anti-inflammatory drugs (NSAIDs) made by another veterinarian gave poor response to medical intervention. The diagnosis was made by clinical, hematological, serum biochemistry and peritoneal fluid exams.

Results and discussions

Horses were presenting signs of severe abdominal pain including: agitation, excessive sweating, flank watching, pawing, frequent lying down, kicking at the abdomen, rolling (Fig 1), absence gut sounds, presence tympanic sounds, abdominal distension, lack of defecation and urination, playing in the water bucket but not drinking, repeatedly going down and getting back up.

Fig. 1. Mare, Hungarian Sport Horse, 400kg, 13 years old, rolling

Fig. 2. White-grey sticky intestinal mucus in a mare

The most critical examination finding is the horse's heart rate, because this has repeatedly been shown to reflect the level of pain and provide an excellent assessment of the cardiovascular status of the horse. Affected horses have progressive signs of sepsis, including congested mucous membranes, delayed capillary refill time, and an elevated heart rate (60-100 beats/min). Rectal palpation of the abdomen revealed distended by gas loops of small intestine, small amount of feces with thick and sticky mucus (Fig 2). Mucus accumulates on the surface of manure when movement of the intestinal contents slows or stops.

A nasogastric tube was used to relieve the amount of gas pressure in the gut, giving gas and fluids an avenue to travel away from the gut. It was administrated parrafin oil 2 L and water. This increases water content of stool acts as a lubricant for intestinal contents and increase passage of feces.

Peritoneal fluid was typically serosanguinous, with elevations in nucleated cell count (>10,000cells/µl) and total protein (>2.5mg/dl). In acute intestinal obstruction with infarction, the peritoneal fluid is bloodstained (Constable et al., 2017). Abdominocentesis can provide critical information on the integrity of the intestine and is indicated in horses with suspected strangulation of the small intestine (White, 1990). A horse that has signs compatible with a small intestinal obstruction and also has serosanguinous abdominal fluid with an elevated protein level is likely to require surgery, although these cases must be differentiated from proximal enteritis. Horses with small intestinal strangulation show continued signs of abdominal pain, whereas horses with

proximal enteritis tend to be depressed after initial episodes of mild abdominal pain (Freeman, 2000).

Hematocrit and total protein were increased due to hemoconcentration due to isotonic fluid loss and sequestration into an obstructed or strangulated bowel segment or into the peritoneal cavity. Leukopenia and neutropenia was caused by devitalization of infarcted intestine and the development of endotoxemia. Creatinine, blood urea nitrogen, phosphorus, glucose and lactate serum were increased. Increases in blood (plasma) and/or peritoneal fluid lactate concentrations are useful for prognostication (Constable et al., 2017).

Previous treatment with antispasmotic (butylscopolamine bromide, dose 0.3 mg/kg, IV) and nonsteroidal anti-inflammatory (flunixin meglumine) drugs made by another veterinarian gave poor response. Buscopan® (butylscopolamine bromide) is antispasmotic, antimuscarinic, anticholinergic drug, inhibits secretions and motility of the gastrointestinal tract by blocking parasympathetic receptors. Butylscopolamine bromide is indicated for treating pain associated with spasmodic colic, flatulent colic, and intestinal impactions in horses (Papich, 2011).

Flunixin (1.1 mg/kg, IV) produces analgesic and antiinflammatory effects by inhibiting the synthesis of prostaglandins. It is used primarily for short-term treatment of moderate pain, inflammation and to decrease signs of sepsis. Horses with colic are often treated with low doses of mg/kg IV q8h (Papich, 2011). We administrated metamizole (Algocalmin®), doze 10ml, IV. This is one of the strongest non-opioid analgesic drugs, used in both human and veterinary medicine (Baumgartner et al. 2009). At present, metamizole is classified as a non-opioid analgesic (Chaparro et al. 2012, Escobar et al. 2012) although for years it was claimed to belong to non- steroidal anti-inflammatory drugs (López-Munoz et al. 2008, Smith et al. 2008, Dominguez- Ramirez et al. 2010). The most important recommendations declared by manufacturers of veterinary medical preparations containing metamizole are: symptomatic treatment of pain, including colic pain, control of fever in the course of different diseases, meteorism and intestinal constipation in horses, acute and chronic rheumatic diseases, as well as inflammation of the nerves, joints, muscles and tendon sheaths (Jasiecka et al., 2014). Horses received also ketoprofen (Ketink®), 3mg/kg ; 1mL/45kg, IV. Ketoprofen, like other NSAIDs, produces analgesic and anti- inflammatory effects by inhibiting the synthesis of prostaglandins. It has a half-life in most animals of less than 2 hours, but it has a duration of action for up to 24 hours. In horses, ketoprofen is used for musculoskeletal inflammation and pain, abdominal pain, and other inflammatory conditions. In horses, ketoprofen has been less ulcerogenic than phenylbutazone or flunixin meglumine in one study (Papich, 2011).

Administration of xylazine (20mL, IV) wich is an alpha2-agonists that decrease release of neurotransmitters from the neuron and is used for short-term sedation, anesthesia, and analgesia in horses, didn't help to control the abdominal pain. IV fluids (NaCl 0.9%, glucose 5%, electrolytes) were necessary for dehydrated or in shock horses.

Progressive pain with poor response to medical intervention, lack of fever and serosanguineous peritoneal fluid were clinical features that helped distinguish strangulating lesions of the small intestine from simple obstructions and enteritis. Gastrointestinal causes of colic that must be differentiated from small intestinal obstructive disease include: gastric ulcer, disorders of the large or small colon, intestinal tympany, thromboembolic colic (Constable et al., 2017).

There is no sign or group of clinical signs which can predict accurately the prognosis for survival of a horse with colic. The best prognosis can be given when referral and medical therapy or surgical intervention occur early in the course of the disease, before the horse's status begins to deteriorate.

The prognosis for survival in horses with small intestinal strangulating lesions is generally lower than for most forms of colic (Blikslager, 2010). The case–fatality rate for horses subjected to surgery is between 30% and 50%, although older reports of the disease had a much higher case–fatality rate (Southwood et al., 2009). Finally one horse was euthanized due to grave or poor prognosis. At necropsy we noticed: large quantity of serosanguinous peritoneal fluid, intestinal serosal surface with numerous petechial and ecchymotic hemorrhages, increased thickness and distended by gas of small intestine loops (Fig 3, 4). The mucosa was deep red and contained petechial hemorrhages and occasional foci of necrosis and ulceration.

Fig. 3. Horse. Small intestine distended by gas, thickened loops, serosal surface with petechial and ecchymotic hemorrhages

Fig. 4. Horse. Volvulus of small intestine (jejunum, ileum)

Strangulating obstruction may be divided into hemorrhagic and ischemic forms. In hemorrhagic strangulating obstruction, which is most common, the veins become occluded before the arteries because of the greater stiffness of arterial walls. This lesion is noted by a darkened appearance in affected bowel and increased thickness as blood is pumped into the lesion (Blikslager, 2010)

Conclusions

Strangulating obstruction of the small intestine is one of the most lethal forms of equine colic. A thorough evaluation of the horse with colic allows early identification of cases that need referral for intensive medical or surgical intervention. Early referral improves the horse prognosis and reduce client costs by allowing intervention while the horse is systemically stable. Minimization of colic episodes depends on management factors, including feeding large quantities of forage, minimizing the amount of concentrate fed and ensuring adequate parasite control.

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