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Focus on Colic

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Next Focus Meetings:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>City, State, USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 22-24, 2012</td>
<td>Focus on Hind Limb Lameness</td>
<td>Oklahoma City, OK</td>
</tr>
<tr>
<td>September 6-8, 2012</td>
<td>Focus on Ophthalmology</td>
<td>Raleigh, NC</td>
</tr>
</tbody>
</table>

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Medical Management of the Acute Abdomen in the Field: Analgesia and Cardiovascular Support

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Analgesia for the Colic Patient in the Field Setting

When the practitioner evaluates a colic patient, the assessment usually includes the history, vital signs, physical examination, and specific diagnostics pertinent to assessment of the gastrointestinal tract, including rectal examination and ultrasound imaging. Medical management may include controlling signs of pain initially to allow for completing the examination and to prevent self-injury of the patient in cases of severe pain. Other indications for pain relief might include controlling the source of the pain to allow time for other medical interventions to take effect. More severe levels of pain may require repeated and more advanced analgesics to control the patient in order to allow for complete assessment, time for safe transport to a referral facility, or in some situations, to allow for client discussion and possibly euthanasia.

In those instances where the pain level is sufficient to impair a complete examination without injury to the horse, its handlers, or the veterinarian, initial sedation and analgesia can be given with alpha-2 agonists such as xylazine (0.5 to 1.0 mg/kg, IV) or detomidine (0.01 to 0.04 mg/kg, IV) either alone, or in combination with butorphanol (0.01 to 0.02 mg/kg, IV). Some caution must be taken in avoiding excessively profound sedation when using detomidine as its analgesic effect may be sufficient to prolong recurrence of a painful episode when a surgical lesion could be present. The duration of effective analgesia is often valuable in determining the significance of the disorder. Repeated requirement for analgesia often indicates more severe lesions that might require surgical intervention.

Analgesia can also be obtained with non-steroidal anti-inflammatory medications such as flunixin meglumine (Banamine®, 1.1 mg/kg, IV initially); however, the onset of effect may take up to 30 minutes and is not as rapid as other medications. This may not allow for timely examination of the more painful patient. It may be sufficient analgesia for most medical, non-surgical lesions and allow for resolution of the lesion causing the pain. Occasionally, lesions such as large colon impactions could persist and require repeated dosing with flunixin meglumine (up to every 8-12 hours) to control the intermittent pain associated with movement and resolution of the luminal impaction.

Identification of luminal gas distension of the large colon with lesions such as displacements may be an indication for use of spasmolytic type medications such as N-butylscopolammonium bromide (Buscopan®, 0.3 mg/kg, IV) to reduce pain associated with serosal distension and intestinal cramping. In the author’s practice, this is occasionally used in combination with flunixin meglumine and intravenous fluid therapy to allow for self-correction of presumed large colon displacements.
Patients requiring repeated dosing of analgesics may have a surgical lesion that necessitates additional diagnostics for confirmation, and referral to a surgical facility.

One obvious mode of pain relief that may be overlooked during the initial examination of the horse exhibiting severe pain is gastric decompression via nasogastric tube. The art of passing a nasogastric tube on the painful colic patient takes some practice. The author believes that ultrasound can be a useful tool in determining the presence of gastric reflux as well as a guide to the need for repeated decompression. Horses often show immediate cessation of signs of pain upon relief of gastric distension. Repeated decompression may be necessary for some lesions, occasionally necessitating an indwelling nasogastric tube – especially if the animal is to be transported.

In some situations, perhaps those where economics or time-frame dictate, relief of colonic gas distension via percutaneous trocharization might also be a consideration. The author reserves this mostly for situations where surgery is not an option for the owner and the diagnosis is likely that of a non-strangulating large intestinal lesion such as a colon displacement with significant gas distension. Selection of the trocharization site is made by ultrasound so as to avoid any colonic or cecal vessels. It is often difficult to obtain sufficient relief of gas distension to make much difference because of occlusion of the needle with ingesta or movement of the bowel. Occasionally, some relief of the gas distension is sufficient to allow for improved ventilation and return of colonic motility and resolution of the clinical signs. The safest technique for trocharization is to select the best area of apposition of gas-distended viscus (large colon or cecal base) against the body wall. This helps to avoid puncture of a vessel on the bowel wall or imperfect puncture of the center of the gas cavity in the bowel. If ultrasound is not available, then select the region with the most intense “ping” sound on percussion. The selected area is clipped and surgically prepped and local anesthesia performed with lidocaine. The author likes to use a 14 gauge intravenous catheter and penetrate the body wall and intestinal wall with a sharp push to embed the catheter into the middle of the bowel lumen. The stylette is then removed to allow gas to escape. As the bowel deflates, luminal content may plug the catheter and a few attempts can be made to dislodge this by flushing with air or saline. Once the bowel is deflated and the catheter is occluded, the author injects gentocin through the catheter as it is being removed from the body wall in an effort to provide an antimicrobial effect along the catheter tract in the body wall. Body wall cellulitis and abscessation are the most common complications of percutaneous trocharization and require close observation of the site for a few days following the procedure.

Cardiovascular Support

Most often the determinations for cardiovascular support will involve assessment of alterations in hydration and perfusion. Hydration is determined by assessment of the skin turgor – an indicator of interstitial fluid volume. Horses with abdominal pain and decreased water intake may demonstrate varying levels of dehydration – a decrease in interstitial fluid volume. This can be corrected with enteral and/or parenteral fluids depending on the severity, clinical situation, patient compliance, and owner’s financial situation. Simple replacement of enteral fluids by nasogastric intubation and enteral water is often sufficient in many cases, although not as...
convenient for practitioner and client time. The addition of electrolyte mixtures is common practice, but often is inadequate in creating a balanced electrolyte composition fluid or for correcting significant plasma electrolyte alterations. Some clinicians also use intravenous fluids to correct dehydration and to maintain intravascular volume, thereby, supporting intestinal perfusion during conditions that may impair intestinal motility and fluid absorption from the intestine. Volumes to instill in the stomach may vary with 6-8 L of total fluid volume being considered sufficient for most adult full-sized equine patients. Up to 10 L of fluids can be instilled into the stomach as often as every 30-60 minutes. Enteral fluids are rapidly absorbed from the stomach wall and small intestine.

Volume of intravenous fluids to correct dehydration may vary. It may be prudent to avoid overhydration of some intestinal lesions so as to avoid creation of interstitial edema within the intestinal wall. An estimate of the volume of intravenous fluid to infuse should take into account the following:
- amount necessary to correct the dehydration
- amount necessary for normal maintenance
- ongoing fluid losses

It is the author’s practice to add potassium chloride (20-40 mEq/L) to the intravenous fluids as many horses with decreased food intake may have potassium depletion that could play a secondary role in the disease process. Similarly, calcium borogluconate may be added to the fluids once daily (125 ml of 23% calcium borogluconate to a 5-liter bag of fluids).

Assessment of perfusion involves assessment of pulse pressure, skin temperature (and possibly rectal temperature), as well as heart rate as indicators of inadequate effective circulating volume or hypotension. Hypotension requires intravenous fluid replacement therapy for correction. Placement of a large (14 to 12-g) catheter can facilitate rapid volume expansion of the vascular space in these circumstances. A 12 gauge catheter can reduce fluid administration time by 75% compared to a similar length 14 gauge catheter. There is continued debate over the fluid type most effective for correction of hypovolemic shock associated with intestinal lesions. The advent of hypertonic saline solutions has allowed for rapid expansion of the intravascular space and restoration of perfusion pressures. Being a crystalloid, this volume expansion will still dissipate over approximately 2 hours by diffusion into the interstitial space. Because of this, it is important that volume replacement with crystalloid fluids be continued after the initial volume expansion with hypertonic saline. Larger volumes (20 to 40 liters) of isotonic crystalloids (LRS, Hartmann’s, Plasmalyte A or 148, or Normosol-R) are required to achieve the same amount of volume replacement effect. The other issue in the field setting is occasionally one of time – that of the clinician and the owner or farm management. If referral is an option for patient management, then the time-frame required for fluid administration prior to transport must be taken into consideration when selecting the fluid type and catheter size.

Monitoring the response to fluid therapy is important. The clinical parameters of hydration – heart rate, mucous membranes, skin temperature, skin tent response, as well as packed cell volume, total solids, and blood lactate levels – can be used to determine if a sufficient correction of dehydration has been achieved with the initial therapy. In addition to these, observation of urination volume and frequency add the concept that sufficient renal blood flow is being
maintained. Animals that fail to produce urine or those that have increasing peripheral edema should raise concern to the presence of renal dysfunction.

If clinical signs of endotoxemia are present, then early intervention to suppress the effects of systemic inflammatory mediators can help improve the cardiovascular status over time especially when transport to a facility may be required. Flunixin meglumine is considered the standard of care for most regions, and is well-documented for its ability to block the cascade of effects of endotoxin. Other medications, such as polymixin B (6,000 units/kg, IV) may also be considered for its ability to bind endotoxin and facilitate renal excretion. With both of these medications, maintenance of renal blood flow with adequate fluid volumes is important.

In summary, attention to pain control and supporting perfusion of vital organs and the potentially compromised intestine is the mainstay of acute care for the colic patient. During this portion of the clinical management, the determination of the precise lesion involved will guide further decision-making as to whether the condition is something that is readily resolved with medical management alone on-site, or whether transportation to a facility is required for ongoing monitoring and care and/or surgical correction of an identified or suspected lesion if appropriate. The outcomes are often determined by this basic attention to pain control, minimizing self-inflicted injury, and rapid restoration of the cardiovascular status to normal conditions for optimal perfusion and maintenance of organ function.