

# Coagulopathies in Horses with Colic

Luis Monreal, DVM, PhD\*, Carla Cesarini, DVM

## KEYWORDS

- Horse • Gastrointestinal disorders • Hypercoagulation
- Disseminated intravascular coagulation • Clinical management

Historically, coagulopathies secondary to gastrointestinal disorders have been the most prevalent cause of hemostatic disorders in horses.<sup>1</sup> Much of the research published on equine coagulation dysfunctions has been done in horses with colic, and several studies evaluating hemostatic profiles in horses with colic obtained results indicating that coagulopathies in these patients may be a frequent finding.<sup>2-11</sup>

In this article coagulation dysfunctions that horses with gastrointestinal disease may develop are reviewed. Readers desiring more information about normal hemostatic function in the horse are referred to already published reviews.<sup>1,12,13</sup>

## TYPES OF COAGULOPATHIES IN HORSES WITH COLIC

Coagulation dysfunctions are normally classified according to the pathophysiology in two processes: (1) the excessive activation of the coagulation system (hypercoagulable state), and (2) the deficient coagulation activation (hypocoagulable state) (**Box 1**). In horses with gastrointestinal disease, coagulopathies are commonly characterized by excess of activation, which may be moderate, marked, or extremely marked depending on the severity and duration of the coagulation activation associated with the gastrointestinal disease. For instance, colon obstructions/displacements usually produce a mild to moderate activation of the coagulation system, which is totally compensated by a proportional activation of the coagulation inhibitory systems (coagulation inhibitors and the fibrinolysis system), with no hemostatic consequences. Acute enteritis may produce a marked activation of the coagulation system frequently compensated by inhibitory systems. This marked hypercoagulation produces coagulation abnormalities consistent with disseminated intravascular coagulation (DIC), but mainly compensated (the subclinical form of DIC). When this hypercoagulation persists over time, marked coagulation consumption may develop and may progress to a coagulation deficiency characterized by a hemorrhagic syndrome (the bleeding form of DIC). In contrast, an extremely severe hypercoagulable state in a short period

---

Servei de Medicina Interna Equina, Departament de Medicina i Cirurgia Animals, Facultat de Veterinària, Universitat Autònoma de Barcelona, 08193-Bellaterra, Barcelona, Spain

\* Corresponding author.

*E-mail address:* [lluis.monreal@uab.es](mailto:lluis.monreal@uab.es) (L. Monreal).

Vet Clin Equine 25 (2009) 247–258

doi:10.1016/j.cveq.2009.04.001

[vetequine.theclinics.com](http://vetequine.theclinics.com)

0749-0739/09/\$ – see front matter © 2009 Elsevier Inc. All rights reserved.

**Box 1****Types of coagulopathies in horses with colic*****Hypercoagulation and DIC (the most common)***

Moderate coagulation activation (eg, obstructions, displacements)

Compensated by the inhibitory systems (hyperfibrinolysis)

Severe coagulation activation (eg, ischemic or inflammatory problems at early stages)

Compensated by the inhibitory systems

Some clinicopathologic abnormalities consistent with DIC (evidence of platelet consumption, coagulation factor consumption, and hyperfibrinolysis)

Subclinical form of DIC

Extremely severe coagulation activation (eg, severe ischemic and inflammatory disorders, severe peritonitis)

Uncompensated form of DIC with massive fibrin deposition in different tissues

Marked alterations in the coagulation profile, consistent with DIC (evidence of platelet consumption, coagulation factor consumption, coagulation inhibitor consumption, and hyperfibrinolysis)

Horses may show clinical signs of DIC consistent with venous thrombosis, tissue hypoxia, and multiorgan dysfunction/failure (the MOFS form of DIC). Few cases may also show hemorrhagic clinical signs consistent with the bleeding form of DIC.

***Hypocoagulation (infrequent)***

Exception has to be taken for the bleeding form of DIC

Normally detected in horses without gastrointestinal disease, but showing abdominal discomfort

Normally associated with liver diseases

of time without subsequent inhibitory reaction may occur in intestinal volvuli or severe colitis with endotoxemia, producing massive fibrin and microthrombi formation and deposition in different tissues, which contributes to multiple organ dysfunction/failure. This severe hypercoagulable state is consistent with DIC (the multiorgan failure form of DIC, MOFS), and contributes to the high mortality rate of these severe cases.<sup>14</sup>

Hypocoagulable states may also be observed in some horses with clinical signs of abdominal discomfort. This coagulopathy is uncommonly seen in these patients, however, and when detected it generally corresponds to the bleeding form of DIC (if associated with a severe primary gastrointestinal disease) or is associated with liver disease.

## **HYPERCOAGULATION AND DISSEMINATED INTRAVASCULAR COAGULATION IN HORSES WITH COLIC**

### ***Definition***

DIC is an acquired coagulopathy characterized by a marked activation of the coagulation system that is normally counteracted by a proportional activation of inhibitory systems. When the marked hypercoagulation overwhelms the inhibitory system, it may cause exaggerated intravascular fibrin formation, with widespread fibrin deposition and microvascular thrombus formation in different tissues. This fibrin deposition and thrombus formation may lead to ischemic tissue lesions and subsequent multiorgan dysfunction/failure (MODS/MOFS). Additionally, the marked activation of the

Download English Version:

<https://daneshyari.com/en/article/2459154>

Download Persian Version:

<https://daneshyari.com/article/2459154>

[Daneshyari.com](https://daneshyari.com)