



Review on prevalence, predisposing factors and therapeutic improving for controlling of equine colic.

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Abstract

Equine colic is one of the most prevalent causes of morbidity and mortality among horses, which requires a better understanding of the prevalence, the risk factors and the therapeutic developments amongst others. This review will focus on the worldwide prevalence of colic in horses, including breed disposition and management (e.g., diet, stabling) and environmental factors. Predisposing factors include sudden change of ration, parasitic burdens, and low levels of intake of legume forages. Treatment is directed toward early intervention with fluid resuscitation (e.g., lactated Ringer's solution), pain control (NSAIDs, opioids), and the surgical

indications in those with severe disease. Recent advancements in methods of diagnosis (ultrasonography, biomarkers) and treatment strategies supported by evidence based protocols are presented to achieve better results. Opponents raise the issue of the future and suggest the importance of owner education and preventive treatment, and focus on research into probiotics and minimally invasive procedures.

Keywords: equine colic, prevalence, risk factors, fluid therapy, surgical management.

Introduction:

Colic is an acute veterinary emergency disease in horses marked by severe abdominal discomfort typically resulting from digestive disorders such as bloating, intestinal obstruction, or torsion [1]. Pain resembling colic may also result from problems in other abdominal organs, including the kidneys, liver, uterus, or peritoneum [2]. The most common cause of death in horses was advanced age, followed by colic [3]. The financial impact of colic was significant due to the number of horses requiring surgery and the high average treatment costs for surgical cases (Smith et al., 2020) [4]. Common clinical manifestations of equine colic include recurrent recumbency or rolling episodes, marked reduction or complete cessation of feed intake, profuse sweating, pain-

related behaviors such as kicking at the abdomen or flank-biting, and altered fecal output (e.g., decreased frequency or changes in consistency) [5]. There are several studies demonstrate significant geographical variation in equine colic incidence rates, reflecting diverse environmental, management, and genetic factors. Recent epidemiological data reveals differences in incidence rates [6], in Iraq the rate was 25%, while in Ethiopia in a 5-month surveillance period reported a 10.3% incidence rate [7]. While in Iran the rate was 8.6% [8]. Due to the limited number of comprehensive studies on colic in horses, this review study aims to study recent global studies on the incidence of colic in horses, review the predisposing factors influencing colic development and investigate the diagnostic techniques used to identify colic

additionally summarize the most common and major treatment strategies for prevention and management.

Etiology and main clinical symptom:

Colic in equines arises from multiple interrelated mechanisms. A review of contemporary veterinary sources organizes the predominant origins into the following groups :

1. Dietary and Management-Related Causes;

Low-quality roughage such as dusty or mold-laden hay and diets deficient in fiber , Abrupt dietary shifts including sudden increases in lush pasture or grain quantity, overfeeding of concentrate rations that can induce gastric distension , sand ingestion from geophagia that can produce occlusive impaction[9].

2. Gastrointestinal Pathologies

Physical blockages, including ileocecal valve retrograde movement and verminous mesenteric arteritis .Functional disturbances such as spasmodic, tympanic, or ischemic colic [8]. Parasitic disease with *Strongylus vulgaris* resulting in thromboembolic occlusion . Bacterial enteritis notably with

Salmonella and *Clostridium perfringens* infections [10].

3. Systemic and Secondary Factors

Dental malocclusion impairing effective mastication and food processing [9] .Stress-related colic precipitated by transport, rigorous training, or environmental shifts .

[10]Viral disease such as Equine Viral Arteritis.

Colic in horses manifests through distinct behavioral and physiological changes, serving as critical indicators for prompt veterinary assessment [11] .

1. Behavioral Indicators of Pain:
Restlessness & agitation: Pawing, kicking at the abdomen, or stamping, abnormal posturing that include Repeatedly lying down and rising, rolling excessively, or assuming a stretched-out stance and Self-directed behaviors as Flank-watching, nibbling at the sides, or lying on the back (a sign of severe pain) .[12]

2.Physiological Abnormalities:
Altered urination: Frequent protrusion of the penis with minimal or no urine output (sham urination). Sham drinking; repeatedly submerging the muzzle in water without consuming it, Profuse sweating, tachycardia

(elevated heart rate), and tachypnea (rapid breathing) .[11]

3. Secondary Systemic Signs: Reduced/absent fecal output: Indicative of intestinal obstruction or ileus, pale or congested mucous membranes lead to circulatory compromise in advanced cases and cold climates due to may signal endotoxin shock or hypovolemia there are various types of colic, that include [12].

Types of Equine colic

Colic in horses encompasses several distinct types based on pathological rather than specific causative factors, the main classified in to several types which include;[10]

1 .Gas Colic (Tympanic Colic): Characterized by distension of the gastrointestinal tract due to abnormal gas accumulation. This results from impaired gas propulsion or excessive fermentation, leading to painful luminal expansion .

2 .Obstructive Colic (Impaction Colic): Caused by physical blockage of the intestinal lumen, typically by dehydrated ingesta (e.g., compacted roughage, grain, or sand). Predisposing conditions include reduced intestinal motility and inadequate mastication .

3. Displacement/Torsion Colic : Involves mechanical displacement of intestinal segments, including:- Volvulus: Axial twisting along the mesenteric attachment and Torsion: Longitudinal rotation of the intestinal tube , these conditions compromise vascular perfusion, constituting surgical emergencies .

4 .Spasmodic Colic : Manifests as paroxysmal intestinal hypermotility and cramping, often idiopathic but associated with autonomic dysfunction or visceral hypersensitivity .

2-4. Predisposing Factors:

Several predisposing increase of equine colic [16] such as ‘

1 -Dietary management [17].

2 Stable Environment:Ninety fours hundred of stalls have sand-based flooring, and most paddocks are also sandy.This poses a colic risk, particularly for horses with behavioral issues or cognitive deficits.

3. Exercise & Digestion :Research indicates that regular exercise enhances feed digestibility. At Al Washburn, 85% of stables use walk machines, with horses (excluding racehorses, endurance, and show horses) receiving: hour of walking/jogging in the morning . ,hour of walking/jogging in the

evening and some facilities allow 10–20 minutes of daily free paddock turnout .[18] 3 .

Pregnancy-Related Colic :[17.1]

4.Pregnancy-Related Colic :Late-term and postpartum mares have a 16% incidence of colic, with a 2% mortality rate .In the Aralt breed, artificial insemination (IA) is common, often using elite Arabian stallions without considering mare size. This can result in oversized foals, leading to recurrent colic in late pregnancy .[17]

Diagnostic approach of colic:

The diagnosis of colic in horses depends on different methods [10], such as:

.Physical Examination : Heart rate is a key indicator of disease severity and progression in horses. Additionally, sweating is a common sign of severe abdominal pain .

2. Rectal Examination : A thorough rectal examination is one of the most critical steps in evaluating colic and should never be overlooked. Distension of the small intestine, for example, is a significant finding that may indicate an obstructive lesion or anterior enteritis .

3.Nasogastric Intubation : Nasogastric intubation is essential in colic cases, both for diagnostic purposes and to relieve stomach distension—a life- saving measure in some instances

4. Ultrasonography : Abdominal ultrasound should be performed systematically using a 2.0 to 3.5 MHz transducer. A standardized procedure has been proposed to allow for rapid abdominal assessment in horses .[19]

5. Radiology : Due to the large size of adult horses, detailed radiographic evaluation of intra-abdominal structures is often impractical .

6. Arterial Blood Pressure: Arterial blood pressure is a reliable indicator of shock severity in colic cases. Its measurement is simple and practical, aiding in prognosis assessment .[20]

7. Prognosis in Strangulating vs. Non-Strangulating Lesions : Strangulating or infarctive lesions have a significantly worse prognosis compared to uncomplicated large colon impactions or spasmodic colic. Mortality rates for different colic causes are discussed in their respective disease sections .[21]

Table 2: show Role of predisposing factors on severity and prevalence of colic in horse

No.	reference	year	Notes
1.	Fikri et al.2024	2024	Poor body condition, Bran feeding ;The researches show high concentration of grain feeding impaction with limited water rising colic risk in horse
2.	Mair et al.	2023	Certain equine may be susceptible to recurrent colic due to factors such as diet, pasture access, dental health, and gastrointestinal ulcers.
3.	Morales-Briceno et al	2020	The incidence of colic due to several causes as low availability of water, management condition, change diet ,stable change, change of owner and trainer and medications
4.	Hassel et al.	2020	The ingestion of sand can induce colic symptoms comparable to those seen in severe colon impactions, including abdominal distension. Additionally, sand or particulate debris may irritate the intestinal mucosa, potentially resulting in diarrhea due to disrupted fluid absorption .Furthermore, prolonged exposure to sand or grit can cause mechanical irritation of the gastrointestinal lining, impairing colonic motility. In severe cases, this may predispose the animal to peritonitis, a serious inflammatory condition of the abdominal cavity
5.	Stancampiano et al.	2017	Gastrointestinal parasite infestation is a significant risk factor for colic, with rising prevalence linked to poor deworming protocols and high parasite burdens. The absence of regular anthelmintic treatment and heavy parasitic infections are key contributors to colic episodes in horses []

6.	Ebony E. Escallona et al.	20214	Crib-biting and wind-sucking behaviors are associated with forage consumption and stabling, particularly during autumn months. Studies suggest that horses exhibiting these stereotypic oral behaviors (CBWs) demonstrate a relatively higher prevalence of colic
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2-7. Treatment :

1-Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) are commonly used in veterinary medicine for pain management, inflammation reduction, and fever control. Below is an overview of some key NSAIDs used in animals, including flunixin meglumine (Banamine®), phenylbutazone (Bute), and ketoprofen (Ketofen®), along with some less commonly used options

2-Alpha-Adrenergic Sedative/Pain-killing Drugs xylazine (Rompun®), detomidine (Dormosedan®). Medications Delivered by Nasogastric Tube Laxatives and other compounds are most often administered by

nasogastric tube, the most common being mineral oil. Mineral oil is not a specific treatment and does not exhibit any effects that cure any specific cause of colic .

3-Intravenous fluid therapy and cardiovascular support

Intravenous fluid therapy for colic usually has many benefits and is seldom contraindicated .

4-Sodium Bicarbonate : Intravenous sodium bicarbonate administration is often used in horses to help correct severe acid/base imbalances, specifically acidosis .

5-ENEMAS: Most important in impaction colic is associated with obstructions in the small and large intestines [10]

Table 2: show role of therapeutic improving on management and controlling of equine colic

No.	reference	Year	Notes
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1.	Fikri et al.	2024	The management of colic and mitigation of risk factors include improved NSAID injections, along with fluid therapy, vitamin B complex supplementation, and gastric intubation.
2.	Barton et al.	2023	The effective management of a critical colic patient largely depends on close monitoring and proper care, particularly during the perioperative phase. This article will review advancements in monitoring methods, fluid therapy, nutritional support, and pharmacologic treatments, with a focus on pain assessment and management [27].
3.	Kassa et al	2021	Meloxicam and s/c administration of antiparasitic drug as ivermectin was effective treatment of spasmodic and impaction colic[28].
4.	Cooke,et al	2021	The promising effects for bacterial probiotic supplements in horses in terms of equine performance and nutrient status for stamina and endurance.[29]
5.	Duz et al.	2019	Flunixin meglumine was the most commonly recommended medicine for colic in all nations, but phenylbutazone was also used, despite the fact that it is only allowed for use in musculoskeletal condition.[30]
6.	Gitari et al.	2017	A commonly used and important treatment for colic involves NSAIDs, particularly the combination of flunixin and butorphanol.

Conclusion:

Equine colic persists as a major health concern for horses all over the world, with high morbidity and fatality rates. Effective control and treatment need a thorough study of its prevalence, risk factors (such as breed, food, nutrition, and

environmental changes), and advances in therapeutic interventions. Future efforts should concentrate on preventive techniques, early detection, and targeted therapies to reduce the impact of colic on equine health.

Knowledge:

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