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Possible Association of Phenylbutazone Toxicity with Susceptibility to Rectal Prolapse in 3 Part-Arab Stallions

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Abstract: Phenylbutazone is the drug most commonly reported to cause toxicity in horses perhaps, because of its widespread use by Veterinarians and horse owners. The three Part-Arab Stallions developed rectal prolapse after receiving an average of 14 mg kg^{-1} as a single dose of phenylbutazone per os, administered by the horse keepers which they consider to be a form of doping. The stallions where adequately restrained and the rectal prolapse manually reduced, using 200 g of sugar granules, a purse-string suture was placed in only the third case and hay withdrawn for 12 h in order to reduce the feed bulk and a possible irritation of the rectal mucosa during defecation. Blood analysis was carried out only in the first case and the clinical pathology result includes neutropenia with a left shift. Hemathology result shows no sign of toxicity in the three cases. These cases revealed a possible association of phenylbutazone toxicity with susceptibility to rectal prolapse of mucosa and submucosa (type 1 prolapse) with no signs commonly attributed to phenylbutazone.

Key words: Phenylbutazone, toxicity, anal prolapse, equine

INTRODUCTION

Rectal prolapsed may occur following any disease that causes tenesmus, including diarrhea, rectal neoplasia and parasitism (Turner and Fessler, 1980) or prolapse can occur following elevations in intra-abdominal pressure during parturition or episodes of coughing (Snyder *et al*., 1985).

Type I prolapse occur most frequently in horses with diarrhea in which the rectal mucosa becomes irritated and protrudes intermittently during episodes of tenesmus (Reed *et al*., 2004). Also toxicity resulting from nonsteroidal anti inflammatory drug (NSAID) administration has been well documented in several species, including horses (Gibson *et al*., 1992; Meschter *et al*., 1990; Collins and Tyler, 1985; Karcher *et al*., 1990; Hough *et al*., 1999). Phenylbutazone is an analgesic and anti-inflammatory drug, commonly used for the treatment of lameness in horses. It is non-steroidal anti-inflammatory drug (NSAIDS). Phenylbutazone is available in many preparations for horses, including 1 g tablets, oral paste syringes (containing 6 or 12 g/syringe), an injectable (200 mg mL^{-1} in 100 mL vials) and oral powder. But is one of the most common medications administered to horses. However,

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phenylbutazone is the drug most commonly reported to cause toxicity in horses, perhaps because of its widespread use by veterinarians and horse owners. Phenylbutazone toxicity in horses is characterized by mucosal ulceration throughout the gastrointestinal tract, oral ulceration, renal papillary necrosis, vasculopathy, thrombosis and protein-losing enteropathy with hypoalbuminemia (Meschter *et al*., 1990; Collins and Tyler, 1985).

Trend of events in 3 Part-Arab horses in this case reveals a possible association of phenylbutazone toxicity with enhanced susceptibility to rectal prolapsed of the mucosa and sub mucosa without signs commonly attributed to phenylbutazone toxicity. This report is aimed at unraveling the possible cause of the rectal prolapse, putting into consideration the various circumstances surrounding these conditions, with the aim of generating a clinical question that could trigger rational answer.

MATERIALS AND METHODS

Case History

First Case

A six year old Part-Arab stallion weighing 300 kg was presented with a type I rectal prolapsed characterized by a doughnut-shaped prolapsed mucosa 16 h after administration of 4000 mg phenylbutazone orally (Fig. 1). This has been practice among horse attendants, especially in Kano (Nigeria).

The horse's body condition score was 2. It was fed on wheat bran and hay with water ad lib. The temperature was 37.8°C, respiratory rate 15 cycles per minutes while pulse rate was 38 beats min^{-1}. There was no sign of diarrhea, colic or weakness. Apparently, the urine flow, colour and quantity were apparently normal.

Second Case

An 8 year old Part-Arab stallion weighing 313 kg presented with a rectal prolapsed characterized by a doughnut shaped prolapsed mucosa which ensured 24 h after administration of phenylbutazone tablets totaling 4400 mg orally (Fig. 2). On physical examination a clear area of whitish and dark coloration on the prolapsed tissue seen with mucosal tear on every lobe of the prolapsed rectum and bleeding. All other vital parameters remain normal with only slight inappetence. The body condition score was 3.

Third Case

An 8 year old stallion presented 24 h after showing sign of rectal prolapse and slight inappetence. The horse weighed 350 kg with a body score of 4. History revealed that

Fig. 1: Prolapse of doughnut-shaped rectal mucosa 16 h after phenylbutazone toxicity

Fig. 2: Corrected rectal prolapse 24 h after

50 tablets of phenylbutazone, i.e., approximately amounting to 5000 mg total dose was administered orally to the horse 24 h prior to presentation.

Laboratory Investigation

Fecal sample was taken in all the three cases in order to check for intestinal parasitism. Also blood sample was taken for clinical pathology analysis.

Clinical Diagnosis

The 3 horses where clinically diagnosed of Type 1 rectal prolapse (i.e., prolapse of the mucosa and submucosa).

Lab. Results

The faecal sample result showed that the horses had no clinical helminthosis. Neutropenia with a left shift was seen in the clinical pathology result.

Management

The horse was adequately restrained in a standing position with the base of the tail shaved and washed with 2% chlorhexidene. A 1 mL solution of 2% xylazine in 9 mL of normal saline using an 18 gauge needle was infused into the lower epidural region. The effect of analgesia on the perineum was verified by pricking the area with a sterile needle.

The perineum and the rectum was washed with an antiseptic (chlorhexidene 2%) and gently removing the necrotic tissue at the surface of the mucosae, then 200 g of sugar granules was applied and massaged gently from 5 O'clock and 7 O'clock position moving upward in order to reduce the prolapsed. The prolapsed rectum was reduced and a purse-string suture was placed for 24 h to prevent reoccurrence, but the other 2 cases no purse-string suture was used but horse keepers were asked to withdraw hay for 24 h and to continue on bran in order to reduce the irritation of the rectal mucosa and also decrease the bulk of feed passing through rectum.

DISCUSSION

Conditions like rectal neoplasia, diarrhea and helminthosis could cause tenesmus which could subsequently lead to rectal prolapse, however, these conditions were not seen to manifest in any of the horses so there was no basis to associate them with the rectal

prolapse. Though the toxic dose of phenylbutazone appears to be 8 to 10 mg kg^{-1} body mass which must be administered for several days to cause signs of toxicosis (Snow *et al*., 1981; MacKay *et al*., 1983; Collins and Tyler, 1985), but in this case it was a single high dose. It has been reported that dosages of 15 mg kg^{-1} or greater, when given on multiple days, can be lethal to horses with death occurring as early as day 4 of treatment (MacKay *et al*., 1983). Ponies may be at greater risk of developing toxicosis, for 10 mg kg^{-1} given once daily to ponies resulted in death of several by day 7 of administration (MacAllister, 1983).

On the average the 3 stallions received approximately 14 mg kg^{-1} of phenylbutazone as a single dose. Though it must be administered at 8 to 10 mg kg^{-1} for several days to elicit signs of toxicity; the difference in breed of horses, management practices, dosage and possibly repeated exposure of the horses to various doses of phenylbutazone at interval by the horse keepers could be some of the reasons why phenylbutazone toxicosis manifested as type I rectal prolapsed.

CONCLUSIONS

The clinical manifestation similar to all the 3 Part-Arab stallions is a pointer to the fact that there could be a possible association of phenylbutazone toxicity with susceptibility to rectal prolapse. Though earlier reports of phenylbutazone toxicity did not indicate any sign of rectal prolapse, it is likely that the Part-Arab horses show a slightly different sign of toxicosis, especially when exposed to high dose of phenylbutazone at intervals, masking the classical toxic signs seen when administered on multiple days. Some management practices and possibly other unknown factors could have also increased the susceptibility to rectal prolapse in this case.

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