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A Toxicology and Clinical Study of Post Race Epistaxis Associated with Exercise Induced Pulmonary Hemorrhage in Thoroughbred Race Horses at the Racecourse Rinconada, Caracas, Venezuela

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Abstract

The aim of this study was to describe cases of epistaxis associated with post-race Exercise Induced Pulmonary Hemorrhage (EIPH) in Thoroughbred horses at the Hippodrome "La Rinconada", Caracas, Venezuela, through a clinic pathological study. We studied a total of 29 cases of epistaxis post-race in Thoroughbred horses at the Hippodrome La Rinconada, Caracas, Venezuela, which is 2,950 meters above sea level. The study included horses between the ages of 2-5 years, 16 stallions and 13 mares, weighing between 450-510 kg. They underwent a clinical examination, although horses presenting with epistaxis were in an emergency situation. Samples of blood and urine were taken for toxicology studies using the competitive ELISA specifically for the drug Furosemide, using the furosemide ELISA kit. Furosemide is allowed when considering the distance of the race, as well as legal regulations for furosemide medication, given 4 hours pre-race, with a maximum 250 mg administered. The clinical findings in all horses studied were: cardio-respiratory collapse, syncope, cyanosis of mucous membranes with the average heart rate 130 bpm, and respiratory rate about 62 rpm. We detected the presence of furosemide in 19 cases, in one case and clenbuterol, aminophylline in 4 cases. It was not possible to detect drugs in 10 individuals who had epistaxis. In conclusion, we performed a clinical and toxicological study in 19 cases of epistaxis associated with pulmonary hemorrhage induced by exercise at the track "La Rinconada", Caracas, Venezuela.

Keywords: Equine; Toxicology; Hemorrhage; Furosemide; HPIE

Introduction

Exercise Induced Pulmonary Hemorrhage (EIPH) is defined as the presence of blood in the trachea or bronchia from the alveolar capillaries [1]. It is a world-recognized syndrome in athletic horses; its incidence varies between 42-85%, with a high impact on athletic performance, and is a cause of sudden death post-race [2-7]. In late 1960's, the injectable furosemide [Lasix, Salix] was first marketed in the United States and shortly after furosemide has been used extensively in the prevention of epistaxis [8]. This use of furosemide was based on clinical experience, and until recently there was no scientific evidence to establish the efficacy of furosemide in the prevention/treatment of epistaxis [8]. Results indicated that prerace administration of furosemide decreased the incidence and severity of EIPH in Thoroughbreds racing under typical conditions in South Africa [9]. Moreover, some United States jurisdictions have long approved the use of furosemide on race day for the prevention of EIPH and/or epistaxis [8]. The aim of this study therefore seeks to describe cases of epistaxis associated with post-race Exercise Induced Pulmonary Hemorrhage in Thoroughbred Horses at the Hippodrome "La Rinconada", Caracas, Venezuela, through a clinical and pathological study.

Material and Methods

There were a total of 29 cases of epistaxis post-race in Thoroughbred horses at the Hippodrome "La Rinconada", Caracas, Venezuela used in this study. During the period 2011 in the Hippodrome "La Rinconada" is located at 2,950 meters above sea level. The horses were between the ages of 2-5 years, with 16 stallions and 13 mares, weighing between 450-510 kg. Each horse underwent a clinical examination. Samples of blood and urine for toxicology studies were taken and analyzed using the competitive Enzyme-Linked Immunosorbent Assay (ELISA) specifically for Furosemide: Furosemide ELISA Kit (1042191 NEOGEN Corporation). Factors that were considered include the distance of the

race, the clinical examination, the use of furosemide, and the use of other therapeutic substances. Furosemide is allowed four hours prior to race time, with a maximum dose of 250 mg according to the regulations of Venezuela. (Regulation National Horse Racing Venezuela, 1995).

Result

The clinical findings in all horses studied were cardio-respiratory collapse, syncope and cyanosis of mucous membranes. The average heart rate was 130 bpm, and the respiratory rate was about 62 rpm. Reading table 1 in 12 cases, there was a history of previous episodes of pulmonary hemorrhage or traces of blood in the endoscopic evaluation.

Discussion

These results suggest a high prevalence of cases of pulmonary hemorrhage induced by exercise with clinical presentation. Exercise Induced Pulmonary Hemorrhage severely affects the performance of horses, and can be one of the leading causes of sudden death after exercise [7]. The distance of the race appears to be a crucial factor in the presentation of epistaxis, as there are a greater number of cases of epistaxis in races at distances of 1800 meters. Sprint distances, such as 1100 meter races, can result in cases of epistaxis as well. This may

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DISTANCE	1100 mts 12 cases	1600mts 03 cases	1800 mts 14 cases
CLINIC	RF: ± 61 HR: ± 130 Cianosis/colapse	RF: ± 62 HR: ± 133 Cianosis/colapse	RF: ± 64 HR: ± 135 Cianosis/collapse
FUROSEMIDE	POSITIVE: +08 NEGATIVE: -04	POSITIVE: +01 NEGATIVE: -02	POSITIVE: +10 NEGATIVE: -04
OTHER DRUG	Clenbuterol +01 Aminophylline -00	Clenbuterol -00 Aminophylline -00	Clenbuterol +02 Aminophylline +02

RF: Respiratory Frequency
HR: Heart Rate

Table 1: Post-race epistaxis, based on distance, clinical evaluation and toxicological screening of drugs.

be due to the faster speeds associated with shorter race distances 1100 meters in 12 cases, 3 cases in 1600 meters and 1800 meters in 14 cases. Intermediate distances had fewer episodes of epistaxis cases. Clinical evaluation evidence in crescent values with increasing distance. Clinical examination in horses subjected to longer distances evidenced more severity of clinical signs and increased recovery time. With regard to the toxicological aspects, 19 of the 29 cases were positive for furosemide, while 10 cases had did not show furosemide use. Although this case was determined by the presence of clenbuterol and in four cases aminophylline all interacting with furosemide, may induce tables predispose to hypertension and consequent pulmonary hemorrhage and epistaxis. In the 19 cases of epistaxis in horses medicated with furosemide, 12 of them had a previous history of bleeding. This suggests that only seven horses had an episode of epistaxis as their first clinical presentation of EIPH. Through a retrospective study of each of the specimens, it was determined furosemide use corresponded to 3 ml of furosemide, intravenously 4 hours pre-race, regardless of weight and previous episodes of epistaxis/EIPH. Pre-treatment of horses with furosemide serves to reduce the incidence of epistaxis and the various

syndromes associated with EIPH, such as sudden death, by 80% [8]. It was not possible to detect drugs in 10 individuals who had epistaxis. In conclusion, we performed a clinical and toxicological study in 19 cases of epistaxis associated with pulmonary hemorrhage induced by exercise at the track "La Rinconada", Caracas, Venezuela.

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