

## A STUDY ON PREVALENCE AND TREATMENT OF ANHIDROSIS IN HORSES

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### ABSTRACT

A total of 290 horses were examined to determine the prevalence of Anhidrosis, find suitable therapy and to record effect of the condition on serum glucose level. The affected horses were divided in two groups i.e. group A received sodium chloride orally 80 grams for 3 days along with injection lasix 100 mg (10ml) for 3 days and ample drinking water. Group B received thyroxin 50 mg orally daily for 3 days, vitamin E 2000 IU orally, normal saline and ample drinking water. The prevalence of Anhidrosis was found to be 12.41 percent (36/290). Serum glucose levels were on higher side in affected horses which returned to normal after recovery, however, blood cholesterol level remained same before and after treatment. In group A and B 33(5/15) and 73.33(11/15) percent horse showed recovery, respectively.

**Key words:** Anhidrosis; Thyroxin; Vitamin E; Normal saline, serum glucose level

### INTRODUCTION

Equine anhidrosis, dry coat, puff disease and non-sweating are different terms used to describe the condition in horses and is characterized by the inability to sweat effectively in response to appropriate stimuli (Dobson, 1979). Sweating has a variety of functions in animals including pheromone actions, excretion of waste products and maintenance of the skin surface ecosystem (McEwan *et al.*, 2006). Although the epidemiology and clinical signs of the disease have largely been elucidated, anhidrosis is still widely prevalent in many parts of the world and methods of treatment and prevention are being sought (Mayhew and Ferguson, 1987). The precise prevalence of the disease is unknown, however it has been estimated that up to 20 percent of horses in Miami area of Florida may be affected (Warner and Mayhew, 1982). Initially it was considered the disease of thoroughbred horses but an epidemiologic study of cases in Florida has shown that many breeds are prone to it, and long time inhabitants of a hot climate, may also be affected (Mayhew and Ferguson, 1987).

The search for precise factors causing equine anhidrosis are yet to be elucidated (Wilson *et al.*, 2007) and despite some excellent epidemiological studies, there has been very little progress in understanding the condition (Marlin *et al.*, 1999). However, certain factors (high protein feed, disease, exercise) tend to raise the basal metabolism of affected horses that exacerbate water loss (polyuria, purgation, etc.) or those influencing heat loss (Julio and Calderin, 1966).

The therapies for this condition more often are based upon clinical impressions rather than scientific evidence treatment coupled with sound environmental management continues to be a very important therapeutic tool for affected horses (Hubert *et al.*, 2002). However,

the therapies seem to provide only temporary relief but complete removal from the environmental stress has a long-term effect. It has been claimed that treatment with vitamin E improves coat appearance and restores sweating in anhidrotic animals. The present study was conducted with the aim to determine the prevalence of equine anhidrosis in Metropolitan City of Lahore, Pakistan, its suitable treatment and effect of both disease and treatment on serum glucose profiles.

### MATERIALS AND METHODS

**Prevalence:** The present study was conducted on cases brought to outdoor veterinary services, University of Veterinary and Animal Sciences, Lahore. In addition the horses referred to various private veterinary clinics were also included in the study during the summer months. A total of 290 horses were clinically examined to find out the prevalence of anhidrosis. Anhidrosis was diagnosed on the basis of clinical signs (Radostits *et al.*, 2007).

**Therapy:** Thirty horses suffering from anhidrosis irrespective of age and sex were divided into two equal groups viz. A and B. Drugs used in groups A and B are given in Table 1. The efficacy of the both treatments was determined on the basis of reversal of clinical signs, negative adrenalin test and normal serum glucose at the end of treatment.

**Serum Glucose and cholesterol levels:** Serum glucose and cholesterol levels were determined (pre and post treatment) using commercially available kit (Bio systems laboratories Ltd., Barcelona, Spain), through enzymatic spectrophotometric method (Coles, 1986).

**Table 1: Detail of drugs used in different treatment groups**

Group	Drugs used
A	Sodium chloride orally 80 grams daily for 3 days.
	Injection Furosemide (Lasix, Hoechst Pharma Pvt. Ltd.) 100 mg (10ml) for three days
	Ample drinking water.
	Thyroxin (GlaxoWellcome, Pvt. Ltd.) 50mg daily for three days orally
B	Vitamin E, (Roch, Pvt Ltd.) 2000 IU orally Normal saline 0.9% I/v 2000ml daily. Ample drinking water

## RESULTS AND DISCUSSION

**Prevalence:** Results of the present investigation indicated that the occurrence of puff disease in horses was 12.41 percent. As this problem mostly happens in summer months its prevalence in July, August and September is given in Table 2. These results are in agreement with the work of Mayhew and Ferguson (1987), Hungerford (1989) and Radostits *et al.* (2007) where the range of problem varied from 6.5 to 15 percent. Increased prevalence of anhidrosis was recorded during July which was due to severe environmental conditions like hot weather and humidity. Severe environmental conditions i.e. hot weather and humidity is considered as major attributing factor in this problem (Smith, 2002).

**Clinical Signs:** Clinical signs observed in horses suffering from anhidrosis during the course of study were: inability to sweat even after hard exercise, dry harsh coat, increased urination and panting. High body temperature, increased pulse and respiration rates were found. It was most probably due to the impairment of thermoregulatory mechanisms of diseased horses (McEwan *et al.*, 2006).

**Chemotherapy:** Treatments are more often based on clinical impressions rather than on scientific facts as the exact etiology and pathophysiology of this condition are still to be known (Hubert *et al.*, 2002).

In group A 5 out of 15 horses were cured completely, whereas four showed slight improvement in their clinical symptoms. Present findings are in partial agreement with Hungerford (1989). Who reported 100% recovery on 20<sup>th</sup> day of post medication as indicated by Hungerford (1989).

Lasix, a loop diuretic used to eliminate salt and water from the body by urination, was good treatment as it help to remove excessively accumulated heat in the body due to non sweating.

In group B, 11 out of 15 horses were recovered completely where as two out of 4 horses showed slight

improvement. This variation in recovery may be due to the severity of disease in different animals. Findings of the present study are congruent with the result of Radostits *et al* (2007). Thyroxin played vital role to activate the thyroid gland because hypothyroidism was also a factor for puff disease. Hood (1979) reported that hypothyroidism cannot be ruled out as a mechanism for equine Anhidrosis. The daily administration orally of 1000-3000 units of vitamin E is also reported to be effective and in severe cases intravenous injection of physiological saline have shown good results (Radostits *et al.*, 2007).

**Serum glucose and cholesterol levels:** In group A, serum glucose-levels were reported to be  $74.47 \pm 5.21$  mg/dl and  $73.47 \pm 5.13$  mg/dl pre-treatment and post-treatment respectively. While in group B animals the serum glucose levels were  $77.87 \pm 4.63$  mg/dl and  $71.87 \pm 4.51$  mg/dl, pre and post treatment respectively (Table-3). These results are in line with earlier work (Hood, 1979; Coles, 1986 and Yashki *et. al.* 1997). Similarly, serum cholesterol levels in group A were recorded as  $133.53 \pm 9.32$  and  $131.53 \pm 9.40$  mg/dl before and after treatment, respectively, whereas in case of group B it was  $139.4 \pm 13.48$  and  $130.4 \pm 11.42$  mg/dl before and after treatment, respectively. Similar findings have been reported by Coles, (1986) and Yashki *et al.*, (1997).

**Table 2. Prevalence of anhidrosis in different months of summer in horses.**

Month	No. of horses examined	No. of positive horses	Prevalence (%)
July	100	14	14.0
August	98	13	13.26
September	92	9	9.78
Total	290	36	12.41

**Table 3. Comparison of serum glucose and cholesterol levels in horses suffering from Puff disease pre and post treatment in groups A & B**

Group	Pre treatment	Post treatment
	Serum Glucose Levels	
A	$74.47^a \pm 5.21$	$73.47^a \pm 5.13$
B	$77.87^a \pm 4.63$	$71.87^b \pm 4.51$
	Serum Cholesterol Levels	
A	$133.53^a \pm 9.32$	$131.53^a \pm 9.40$
B	$139.4^a \pm 13.48$	$130.4^b \pm 11.42$

\* Values are given as Mean  $\pm$  S.E

\*\*Values with different superscripts for each parameter differ significantly from each other in rows ( $p<0.05$ ).

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