

CLINICAL AND BIOCHEMICAL STUDIES IN EQUINE COLIC

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ABSTRACT

Twenty horses suffering from colic were studied for clinical observations and changes in serum electrolytes (Na, K, HCO₃, Cl) and PCV. Colic was confirmed by the rectal palpation. The rectal temperature, heart rate and respiration rates showed a significant increase in colic group. In the serum electrolytes, i.e., Na, and K difference was non-significant, while HCO₃ and Cl showed significant decrease with control. Their values were 127.85, 4.25, 87.85 and 30.97 mEq/L respectively for this group. The average PCV recorded was 36.05% with non-significant difference between the colic and control horses.

INTRODUCTION

The incidence of alimentary tract colic is higher in all breeds of horses (Frank, 1970). The clinical findings exhibited by colicky horse are restlessness, kicking at belly, looking at flank and rolling. Death of animal is caused by dehydration, intoxication, exhaustion and imbalance of serum electrolytes (Blood and Radostits, 1994). A confirmation of diagnosis as well as status of animal can only be provided by blood chemistry and PCV (Singh *et al.*, 1975). Study of the changes in serum electrolytes, i.e., Na, K, HCO₃ and Cl with packed cell volume do indicate the severity of the disease (Datt and Usenik, 1975; Bristol 1982). The aim of this study was to reach on proper diagnosis before the treatment, whether the animal could be saved through conventional routine treatment or the pathological change in intestines are irreversible. The serum electrolytes, packed cell volume and rectal palpation finding are co-related to reach on proper diagnosis.

MATERIALS AND METHODS

Twenty local breed, Tanga Pony horses, with the history of pain were brought to the outdoor hospital of College of Veterinary Sciences, Lahore, from April 1994 to August 1994. Their detailed history of feeding and sex was recorded. There were fifteen females and five males. Ten normal local breed horses were kept as control. Heart rate, respiration rates and rectal temperature were noted. Rectal palpation was performed to confirm the colic and to differentiate between various forms of colic (Frank, 1970; Coffman, 1975; Kalsbeek, 1975; Blood and Radostits, 1994). Out of 10 ml blood taken from juglar vein, some was mixed with EDTA to perform PCV by microhaematocrit method. Rest of the blood was centrifuged and serum electrolytes were determined by flamephotometry (Coles, 1986). The

values obtained were analyzed statistically (Steel and Torrie, 1981).

RESULTS AND DISCUSSION

Twenty horses suffering from colic were kept in colic group. All the animals of this group showed similar signs of pain, i.e., alertness, looking at flank, lying on the ground, sweating and dog sitting posture, while animals with severe pain showed rolling, kicking at belly and struggling. Mean rectal temperature, heart rate and respiration rate in colic group was 101.96 °F, 53.25 beat/min and 35.45 / min respectively (Table 1). The PCV was 36.05%. Serum electrolytes, i.e., Na, K, HCO₃ and Cl were 127.85, 4.25, 87.85 and 30.97 mEq./L, respectively (Table 2). The detailed history of all horses is given in Table 3.

Table 1: Mean ± SE values of physical findings in colic and control group.

	Group	
	Colic	Control
Heart Rate/ Min	53.25 ± 2.19 a	29.7 ± 2.23 b
Respiration/Min	35.45 ± 2.89 a	11.70 ± 0.23 b
Rectal Temp. °F	101.96 ± 0.20 a	99.83 ± 0.23 b

Values with different letters in a row differ significantly (P < 0.05).

Table 2: Mean ± SE values of serum electrolytes and PCV in colic and normal horses.

	Group	
	Colic	Control
Na mEq/L	127.85 ± 2.33	136.05 ± 1.48
K mEq/L	4.25 ± 0.17	3.42 ± 0.27
HCO ₃ mEq/L	30.97 ± 0.91 a	38.28 ± 0.69 b
Cl mEq/L	87.85 ± 2.7 a	102.8 ± 1.03 b
PCV %	36.05 ± 2.87	41.3 ± 1.01

Values with different letters in a row differ significantly (P < 0.05).

TABLE 3: Clinical and biochemical observations of colic.

Sr. No	T	HR	R	Na	k	Cl	HCO ₃	PCV%	R.P.	Duration & Sex	Feeding History
	99-101	20-40	10-14	132-146	2.4-4.7	79.109	35.5-41.7	37-45			
1	101	52	50	140	4.3	114	30.3	46	Nothing	Mild. 6 hrs. (F)	N. D. F. G.
2	101	40	24	138	4.0	85	39.1	25	Hardmass	Moderate. 8 hrs. (F)	N. D. F. G.
3	101	80	20	142	4.9	80	31.2	30	Hardmass	Mild. 2hrs. (F)	N. D. F. G.
4	101	52	22	119	4.1	87	30.5	25	Deep Abd. Hardmass	Moderate. 8 hrs. (F)	Ji
5	101	42	28	115	4.9	78	30.7	28	Nothing	Mild. 12 hrs. (M)	N. D. F. G.
6	101	35	28	138	4.8	92	34.2	50	Nothing	Mild. 24 hrs. (F)	N. D. F. G.
7	101.2	58	30	134	3.7	86	33.5	32	Left side HM	Moderate. 36 hrs. (M)	Ji
8	101.8	52	39	130	4.7	69.6	28.5	60	Nothing	Mild. 4 hrs. (F)	N. D. F. G.
9	102	65	50	120	5	90	26.5	45	Left side air	Restless severe. 7 hrs. (F)	N. D. F. G.
10	102	55	33	130	5.6	90	26.5	30	Left side HM	Severe, Biting, Standing, 10 hrs. (F)	Ji
11	102	50	17	120	4.7	85	25.5	35	Right side air	Mild. 12 hrs. (F)	Gr.
12	102	66	32	112	5.5	72	25.5	62	Air like	Severe, Restless, Sitting, Standing. 12 hrs. (F)	Ji, Gr.
13	102	50	49	136	2.8	67	34.5	21	Right HM	Mild. 8 hrs. (M)	N. D. F. G.
14	102	42	28	117	4.6	93	28.6	21	Right side HM	Moderate, Restless. 8 hrs. (M)	Ji
15	102	54	60	128	3.9	95	34.4	45	Air	Sweating, Severe, Sitting, Standing. 5 hrs. (F)	Gr, N. D. F. G.
16	102.4	40	60	136	3.3	92	40.5	32	Air	Severe, restless. 4 hrs. (F)	Gr., N. D. F. G
17	103	60	30	140	4.2	113	31.5	53	Left side HM	Severe, Restless. 4 hrs. (F)	Ji
18	103	66	42	110	2.7	80	32.7	23	Left side HM	Severe, Restless. 4. hrs. (F)	Ji
19	103.8	70	43	118	3.9	97	25.0	30	Air	Moderate, not so much. 48 hrs. (M)	Ji
20	104	56	24	134	3.5	91.4	36.1	28	Left side HM. Strongyles	Severe Restless 48 hrs. sitting, standing, sweating	N. D. F. G.

LEGENDS :

N : Nothing found upto arms length., H.M. : Hard Mass., A : Air or tympany., L.S.H.M. : Left Side Hard Mass. D.A.H.M. : Deep Abdominal Hard, Mass., L.S.A. : Left Side Air., R.S.A. : Right Side Air., R.H.M. : Right Side Hard Mass., N.D.F.G. : Normal Daily Fooder Grass., Ji : Jai grass. Gr. : Grains., F : Female., M : Male., St.: Strongyles., T : Temperature., H.R.: Heart Rate., R : Respiration., Na : Sodium electrolyte., K : Potassium., Cl : Chloride., HCO₃ : Bicarbonate., PCV : Packed Cell Volume., R.P. : Rectal Palpation findings.

The statistical analysis showed a significant difference in rectal temperature of control and colic horses. There was significant increase in rectal temp., could be due to pain, excitement and muscular exertion, (Datt and Usenik, 1974; Kalsbeek, 1975; Blood and Radostits, 1994). There was a significant increase in heart rate of diseased horses and the elevation in heart rate and respiration in colic group could be due to violent struggle, severity of obstruction or air in intestine. The cause might be change in diet from common grass to *Avina sativa* (Jai), variation in weather, that is hot season and worm infestation, i.e., strongyles (Frank, 1970; Datt and Usenik, 1974; Kalsbeek, 1975; Singh *et al.*, 1975; Reeves *et al.*, 1989).

Rectal palpation revealed impacted mass, air and obstruction in different parts of intestines mentioned (Table 3) that helped in confirmation of colic and to differentiate between different forms of colic (Frank, 1970; Coffman, 1975; Kalsbeek, 1975; Ruggles and Ross, 1991). Respiration of the diseased animal showed a significant increase as compared to the control group. Statistically sodium and potassium showed non-significant difference. Decrease in sodium value and normal value of potassium ion have commonly been reported in colic (Bristol, 1982; Mert *et al.*, 1989-90). The cause in this case might be compensatory alkalosis and acid base regulatory mechanism functioning in the body with the help of kidneys (Coles, 1986). No loss in chloride ion has been reported (Bristol, 1982; Blood and Radostits, 1994). But in this case chloride ion decreased significantly in colic group. The bicarbonate ion showed significant decrease in colic group that could be due to the metabolic acidosis initiated by the compensatory mechanism of the kidney and lungs (Datt and Usenik, 1974; Bristol, 1982). The PCV showed non-significant difference statistically between the colic and control horses. The aim of this study was to know the difference between clinical and biochemical observations in the colic group and control horses.

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