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## Evaluation of Clinico-haematological alterations in bovine affected with intestinal obstruction

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### Abstract

Intestinal obstruction is very common affection in case of bovine and it may be due to intussusceptions, feed bolus and volvulus. To evaluate the hematological alteration in animals suffering from intestinal obstruction this study was designed and conducted in 25 normal bovine (Buffaloes = 15, Cattle = 10) and 13 bovine affected with intestinal obstruction out of which 8 were buffaloes and 5 were cattle. Fifteen buffaloes and 10 cattle were included in this study as control group and eight buffaloes and 5 cattle were included in other group. Animals affected with intestinal obstruction diagnosed on the basis of history clinical parameter and ultrasonographically. In case of clinical parameters of buffaloes significant changes were observed in heart rate and rectal temperature but there is no significant changes in respiration rate whereas in case of cattle significant changes observed only in heart rate and there is no significant changes in respiration rate and rectal temperature. In hematological parameters red blood cells, neutrophils and lymphocyte shows the significant changes in buffaloes whereas in cattle hemoglobin, packed cell volume and lymphocyte shows significant changes other parameters are in normal range with no significant changes.

**Keywords:** Evaluation, Clinico-haematological, alterations, obstruction

### Introduction

In bovine, there are many causes of obstruction of the intestine such as intussusceptions and volvulus, feed boluses, blood clots or hair balls (Radostits *et al.* 2007)<sup>[8]</sup>. The clinical signs are abdominal pain (restlessness, kicking at the abdomen, lying down and getting up frequently, abnormal posture), scant or absence of faeces, blood stained faeces, increased heart rate, abdominal distension, progressive dehydration and toxemia leading to shock and recumbency (Anderson & Ewoldt 2005; Radostits *et al.* 2007)<sup>[1, 8]</sup>. The clinico-haematological changes of intestinal obstruction in bovines are remarkably different from those in monogastric animals (Makhdoomi & Singh 1995). Most of the previous studies on biochemical changes in intestinal obstruction have been carried out on few parameters. The present study was conducted to evaluate clinical and haematological alterations in cattle and buffaloes affected with intestinal obstruction.

Surgical disorders of the gastrointestinal tract in cattle and buffalo occur frequently, and Veterinarians are challenged to determine an accurate diagnosis and treatment for these conditions. Although surgical diseases most commonly occur in the forestomach (dislocated abomasum, reticuloperitonitis), colons (caecal dilatation) and the lesions in the small intestine (duodenum, jejunum, ileum) (Anderson and Ewoldt, 2005)<sup>[1]</sup>. Cattle require surgery for small-intestinal problems less frequently than they do for abomasal, forestomach, or large-intestinal problems.

### Materials and Methods

#### History, and clinical examinations

Twenty five normal bovine in which 15 buffaloes and 10 were cattle examined in the Department of Surgery and Radiology, College of Veterinary Science, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab, India. The buffaloes (n=15) presented to the hospital for superficial injury like teat abrasion, skin trauma were considered as control group for the study. Eight buffaloes diagnosed with the help of clinical examination and ultrasonography (dilated intestinal loops were observed) for intestinal obstruction formed the other group. Diseased buffaloes were referred to the hospital because of anorexia, sharp drop in milk yield, high rise of temperature.

The duration of illness varied from 1 to 2 weeks before admission. There was a history of previous medications including antibiotic injections, fluid therapy. All animals were examined clinically as described before which included general condition and auscultation of the heart, lungs, and rumen. In addition, rectal temperature, respiration rate and heart rates were also recorded. The general health condition of most of the animals was deteriorated.

### Haematology

For haematological study, two ml of blood was drawn by venipuncture of the jugular vein using 18 gauze hypodermic needle and transferred to the sterile vial containing ethylene Diamine Triacetate (EDTA). From the pooled blood, routine haematology was performed which include red blood cells (RBCs), Haemoglobin (Hb), Total leukocyte count (TLC), Differential leukocyte count (DLC) and Packed cell volume (PCV).

### Statistical analysis

Descriptive statistical analysis was performed using SAS 9.4 (SAS institute USA). Student t-test: Two samples assuming

unequal variance was used to determine the significant difference from each other. The resultant data was presented as mean± standard error for each parameter, the level of significance was statistically considered at 5%.

### Result and Discussion

In buffaloes suffering from intestinal obstruction, there is no significant changes were observed in respiration rate whereas heart rate was found to be significantly increased from the normal and rectal temperature was significantly decreased from normal (Table.1). It could be because of high temperature and inflammation. El-Ashker *et al.* (2013) [2] reported the mean rectal temperature, heart rate and respiration rate as 102.6±0.22°F, 78±2.90 bpm and 14.40±0.50/ min, respectively in buffaloes affected with TRP. Ghanem (2010) [3] reported mean rectal temperature, respiration rate and heart rate as 101.3±0.7°F, 48.5±4.5/min and 89±6.3 bpm in Egyptian cattle suffering from traumatic reticulo-peritonitis. Reddy *et al.* (2014) reported the mean rectal temperature, heart rate and respiration rate as 103.8±0.03 °F, 78.24±2.3 bpm and 32.21±0.62/min in cattle suffering from traumatic reticulo-peritonitis.

**Table 1:** depicting the clinical parameters of normal buffaloes and those were affected with intestinal obstruction.

Parameters	Normal (n=15)	Intestinal obstruction (n=8)
Age (years)	7.53±0.48 (5.00-12.00)	7.37±0.80 (4.00-10.00)
Body weight (kg)	378.46±10.02 (300.00-450.00)	355.15±12.99 (300.00-400.50)
Respiration rate (per minute)	36.13±1.57 (27.00-46.00)	34.62±2.96 (23.00-45.00)
Heart rate (beats/min)	57.70±0.32 (54.41-59.76)	61.11±1.81** (56.12-70.12)
Rectal temperature (°F)	100.47±0.11 (100.00-101.40)	100.03±0.43** (98.00-101.40)

NS  $p > 0.05$ , \* $p < 0.05$ , \*\* $p < 0.01$

**Table 2:** depicting the clinical parameters in normal cattle and those affected with intestinal obstruction

Parameters	Normal (n=10)	Intestinal Obstruction (n=5)
Age (years)	6.35±0.58 (3.00-9.00)	6.40±0.48 (5.50-8.00)
Body weight (kg)	349.53±14.31 (290.00-408.00)	340.23±19.30 (300.10-410.46)
Respiration rate (per minute)	34.90±1.47 (28.00-40.00)	29.40±2.83 (19.00-35.00)
Heart rate (beats/min)	57.72±0.20 (56.37-58.47)	68.78±4.05** (59.56-78.46)
Rectal temperature (°F)	100.80±1.47 (100.00-101.50)	100.38±0.22 (100.00-101.20)

NS  $p > 0.05$ , \* $p < 0.05$ , \*\* $p < 0.01$

Among the clinical parameters in cattle affected with intestinal obstruction respiration rate and rectal temperature shows no significant changes whereas heart rate increased significantly. It could be because of inflammation. (Table 2) The mean±SE of red blood cells ( $P = .03$ ), neutrophils ( $P = .02$ ) and lymphocytes ( $P = .0001$ ) increased significantly in case of buffaloes affected with intestinal obstruction. (Table.3) Parihar, (2019) [5] reported that in cattle and buffaloes having

diaphragmatic hernia no significant changes was recorded in haemoglobin, lymphocyte, and monocyte were decreased non significantly and the total leukocyte count ( $\times 10^3$ ), the RBC count, packed cell volume (%) and neutrophils (%) were increased non significantly in comparison to normal animals. Hussaein and Rudolf (2014) observed that in the buffaloes having diaphragmatic hernia, mean leukocytes count was within the normal range.

**Table 3:** depicting the haematological parameters of normal buffaloes and those affected with intestinal obstruction

Parameters	Normal (n=15)	Intestinal Obstruction (n=8)
Haemoglobin (g/dl)	12.02±0.33 (10.00-14.00)	10.23±0.28 (9.00-11.50)
Red blood Cells ( $\times 10^6$ )	5.84±0.17 (5.00-6.90)	6.69±0.07* (6.45-7.02)
Packed cell volume (%)	35.64±0.74 (30.15-39.06)	32.16±1.05 (28.98-35.56)
Total leucocyte count ( $\times 10^3$ )	10.25±0.20 (8.99-11.70)	8.19±0.43 (6.70-9.56)
Neutrophils (%)	56.31±0.47 (54.11-59.88)	65.76±1.69* (45.87-70.56)
Lymphocytes (%)	39.31±0.07 (38.92-39.83)	36.89±1.21** (30.00-40.56)
Monocytes (%)	2.33±0.06 (1.87-2.67)	1.61±0.15 (1.19-2.21)

NS  $p > 0.05$ , \* $p < 0.05$ , \*\* $p < 0.01$

Turkar and Uppal (2006) [6] examined ten clinical cases of diaphragmatic hernia in buffaloes and level of haematological parameters reported were: Hb (7.60±0.36 g/dl), packed cell volume (27.90±2.17%) and TLC (5.22±0.66 $\times 10^3/\mu\text{L}$ ). Saini

*et al.* (2007) [7] evaluated a five year old Holstein Friesian cow suffering from diaphragmatic hernia. The haematological analysis revealed Hb, PCV, TLC, neutrophils, lymphocytes, monocytes and eosinophils as 10.4g/dl, 7.5 $\times 10^3/\mu\text{L}$ , 36%, 1.8

$\times 10^3/\mu\text{L}$ ,  $5.1 \times 10^3/\mu\text{L}$  and  $0.45 \times 10^3/\mu\text{L}$  respectively. Leukocytosis with left- shift and neutrophilia are common haematological finding with TRP (Radostits *et al.* 2007) [8]. In buffaloes with reticular abscess, 36 percent cases show high TLC count that was  $>12000/\text{ml}$  (Fubini *et al.*, 1989) [9]. Kumar

*et al.* (2008) [10] in 18 bovines suffering from perireticular abscesses found mean haemoglobin ( $11.4 \pm 0.56 \text{ g/dl}$ ) and mild leucocytosis ( $12920 \pm 1580/\mu\text{L}$ ) with absolute neutrophilia ( $7980 \pm 1280/\mu\text{L}$ ).

**Table 4:** depicting the haematological parameters of normal Cattle and those affected with intestinal obstruction.

Parameters	Normal (n=10)	Intestinal Obstruction (n=5)
Haemoglobin (g/dl)	10.29 $\pm$ 0.11 (9.96-11.00)	9.46 $\pm$ 0.67** (7.50-11.32)
Red blood Cells ( $\times 10^6$ )	7.95 $\pm$ 0.17 (7.32-8.91)	7.45 $\pm$ 0.15 (7.20-8.06)
Packed cell volume (%)	36.31 $\pm$ 0.11 (35.89-37.11)	29.17 $\pm$ 1.81** (24.56-34.54)
Total leucocyte count ( $\times 10^3$ )	10.04 $\pm$ 0.13 (9.11-10.55)	11.50 $\pm$ 0.37 (10.50-12.04)
Neutrophils (%)	55.17 $\pm$ 0.31 (54.00-56.67)	54.79 $\pm$ 6.97 (36.56-70.65)
Lymphocytes (%)	41.99 $\pm$ 0.37 (40.00-43.10)	28.65 $\pm$ 2.28** (23.54-34.45)
Monocytes (%)	2.29 $\pm$ 0.06 (2.10-2.65)	2.09 $\pm$ 0.03 (2.01-2.21)

NS  $p > 0.05$ , \* $p < 0.05$ , \*\* $p < 0.01$

The cattle suffering from intestinal obstruction haemoglobin (P=.006) (g/dl), packed cell volume (P=.0001) and lymphocyte (P=.05) (%) decreased significantly. No significant change was recorded in other parameters (Table.4). Talekar *et al.* (2018) recorded the values of diverse haematological parameter of diaphragmatic hernia in two Gir cows. The values of diverse haematological parameters were as under: in cows haemoglobin (10.0 and 10.6 g/dl), PCV (28 and 31%), differential leukocytes count (Neutrophils-68.5 and 72%, lymphocytes- 29%, monocytes- 0.8 and 15), total erythrocytes count ( $5.1$  and  $5.7 \times 10^6/\mu\text{L}$ ), total leukocytes count (28.9 and  $30.2 \times 10^3/\mu\text{L}$ ). Mayer *et al.* (1992) [12] and Vanitha *et al.* (2010) [13] reported that haemoglobin, packed cell volume and erythrocyte count was noticeably reduced in affected animals as compared to normal animals, which could be due to low intake of feed, water, dietary deficiency, impaired digestion and accumulation of food material (Kaur and Singh 1994, Raut, 2009 and Vanitha *et al.* 2010) [14, 15, 13]. Significant leucocytosis, increased neutrophilia and corresponding lymphocytopenia noticed in affected animals might be due to localized/generalized infection.

### Conclusion

In case of buffaloes affected with intestinal obstruction heart rate increased significantly and rectal temperature decreased significantly whereas in case of cattle only heart rate increased significantly and no other clinical parameters show changes. In haematological parameters lymphocyte, haemoglobin and packed cell volume decreased significantly in case of cattle whereas in buffaloes red blood cells, neutrophils significantly increased and lymphocyte decreased significantly and others parameters were in normal range.

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