

Studies on Chronic Diarrhoea Associated with Acute Traumatic Reticuloperitonitis in Cows and Buffaloes

Abd El Khalek El Sheikh, Hatem Selim and Abd El Monem Ahmed

Department of Animal Medicine, Faculty of Veterinary Medicine, Zagazig University
onetwovet@yahoo.com

Abstract: This study was done on 33 cases: from them 10 cows and 10 buffaloes were used as a control, 7 cows and 6 buffaloes were suffering from acute diffuse traumatic reticuloperitonitis including :anorexia, sharp decreased in milk yield, systemic reaction (rise of body temperature, tachycardia and tachypnoea), recurrent tympany and abdominal pain as well as chronic diarrhoea. **Hematological changes:** The blood of diseased animals showed significant decrease in the total erythrocytic count, Hb concentration and lymphopenia and significant increase in the total leukocytic count, neutrophilia and packed cell volume, while there was significant decrease in the total leukocytic count in one cow and one buffalo only from the diseased animals. **Serum analysis showed** Hypoproteinemia, hypoalbuminemia, hyponatremia, hypokalemia and hypochloremia and significant increase in the globulin level, haptoglobin and hyperfibrinogenemia. **Ultrasonographic findings:** The normal reticulum appears as a half-moon-shaped with smooth contour and contracts three biphasic contractions per three minutes. In the diseased animals a thick and corrugated reticular wall, echogenic fibrin threads and anechogenic to hypoechogenic fluid were seen on the reticular serosa with reduction in the reticular biphasic contraction. It is concluded that the chronic diarrhea that associated with acute diffuse traumatic reticulo-peritonitis in cows and buffaloes has a dangerous effect on general health condition as well as hematological, serological and ultrasonographic changes.

[Abd El Khalek El Sheikh, Hatem Selim, Abd El Monem Ahmed. **Studies on Chronic Diarrhoea Associated with Acute Traumatic Reticuloperitonitis in Cows and Buffaloes.** *N Y Sci J* 2012;5(11):11-14]. (ISSN: 1554-0200).
<http://www.sciencepub.net/newyork>. 3

Keywords: Chronic Diarrhoea; Acute Traumatic Reticuloperitonitis; Cow; Buffalo

1. Introduction

Anatomical structure of the digestive system in ruminants, method of prehension, age, sex of the cattle and the nature of food intake are considered the most prominent risk factors for the occurrence of traumatic reticuloperitonitis (*Kelly, 1984*) which may causes acute diffuse peritonitis which may be lead to chronic diarrhoea as well as signs of mild indigestion, mild tympany and undigested fibrous material in the feces. (Andrews et. al. 2004), abnormal appetite and milk yield, rumen smaller than normal, weak and irregular rumen contraction, chronic bloat, stiff gait and persistent grunt (*Hajighahramani and Ghane, 2010*). Other signs such as dyspnea, diarrhea, neurological disorders and sudden death were also observed by (*Roth and King, 1991*).

2. Materials and Methods.

This study was done on 33 cases: from them 10 cows and 10 buffaloes were used as a control, 7 cows and 6 buffaloes were suffering from diarrhoea associated with acute diffuse traumatic reticuloperitonitis, including :inappetance to anorexia, sharp decreased in milk yield, systemic reaction (rise of body temperature, tachycardia and tachypnoea), recurrent tympany, ruminal hypomotility, scanty and hard faeces , chronic diarrhea and abdominal pain reaction including grunting sound, abducted elbows and arched back.

Two blood samples were collected from each cattle for evaluation of Total erythrocytic count (*Schalm, 1979*), total leukocytic count (*Benjamin 1978*), differential leukocytic counts (*Coles, 1986*), Hb (*Wintrobe, 1965*) and PCV (*Coles, 1986*). as well as plasma fibrinogen level (*Benjami, 1979*) using the spectrophotometer.

The second sample (coagulated blood sample) was taken to obtain clear sera for determination of serum protein: *Cannon et al. (1974)*, albumin (*Grant et al., (1987)*).

Serum globulin was calculated by subtraction albumin from total protein, the results were expressed in g/dl.

Serum haptoglobin (*Elson, 1974*), sodium and potassium (*Bhattacharya et al., 1978*) and Chloride (*Chawla, 2003*).

Flame photometer:

It was used for estimation of serum sodium and potassium levels

For ultrasonographic examination of the reticulum and rumen, the transducer is applied to the ventral aspect of the thorax on the left and right of the sternum and to the left and right lateral thorax up to the level of the elbow (*GÖtz, 1992, Braun and GÖtz, 1994, Kaske et. al. 1994 and Braun et. al. 1997*). They were examined by an ultrasound scanner equipped with 3.5 curved linear transducer and 5

MHz convex sector was used, then the images were printed.

Statistical analysis was performed using one-way analysis of variance (ANOVA) procedure followed by Duncan's Multiple Range test according

to (*Duncan, 1995*). The 0.05 level of probability was used as the criterion for significance.

3. Results

Table 1: Clinical findings of cases suffering from chronic diarrhoea following acute diffuse peritonitis:

Items	Control cow	Control buffaloes	Diseased cows	Diseased buffaloes
Temp.	38.56±0.1	38.46±0.12	40.2±0.29	40.46±0.31
Pulse	67.2±1.35	66.2±0.86	86.6±1.28	87.4±1.03
Resp.	24.6±0.92	25.8±0.86	35.2±1.15	37.4±1.43
Faeces	Semi-solid	Semi-solid	Diarrhoeic faeces	Diarrhoeic faeces
Pain reaction	-ve	-ve	+ve	+ve
Heart sounds	Normal	Normal	Tachycardia	Tachycardia
-Jugular vein	No pulsation	No pulsation	No pulsation	No pulsation
Brisket	No edema	No edema	No edema	No edema

Table 2: Laboratory findings of cases suffering from chronic diarrhoea following acute diffuse peritonitis

Items	Control cow	Control buffaloes	Diseased cows	Diseased buffaloes
RBCs x10 ⁶	5.92±0.2	7.15±0.22	4.94±0.11	5.69±0.18
WBCs x10 ³	6.66±0.26	7.7±0.19	15.96±0.85	16.26±0.97
Neutr%	36.4%±0.009	38.4%±0.01	68.6%±0.009	70.4%±0.01
Lymph%	58.8±0.009	57.2%±0.01	26.8%±0.01	24.8%±0.01
Hb g/dl	11.12±0.62	11.5±0.58	8.38±0.17	8.16±0.17
PCV%	30.4±1.43%	31.6±1.5%	37.4±1.2%	40.6±1.5%
Ptn g/dl	7.74±0.01	6.36±0.01	7.02±0.17	5.98±0.19
Album g/dl	4.61±0.01	3.82±0.01	3.62±0.12	3.09±0.02
Glob g/dl	3.13±0.007	2.54±0.004	3.39±0.05	2.88±0.17
Na mmol/l	142±1	138.6±0.92	137.3±1.43	137.3±1.43
K mmol/l	4.96±0.12	4.86±0.09	4.25±0.15	4.25±0.48
Cl mmol/l	103±1.73	102±1	94.1±2.77	94.1±2.77
Hepo g/l	0.07±0.007	0.032±0.009	1.04±0.1	0.72±0.086
Fibri mg/dl	203.8±1.42	207.4±1.36	519±1.3	542.8±1.71

Ultra sonography healthy cows and buffaloes:

The reticulum is examined from the ventral of the thorax to the right and left of the sternum up the the level of elbow joint. It's half moon shape, smooth contour with biphasic contraction that occurred 3 to 4 times per 3 minutes. The distance between reticulum and diaphragm was ranged between from 0.45 to 0.55 cm in cows and 0.43-0.53 cm in buffaloes, diaphragm, cranial dorsal sac of rumen and spleen in most of animals or abomasum appeared near the reticulum.

Ultra sonography diseased cows and buffaloes:

In six cows, six buffaloes and one cow bull the reticulum appeared thickened and corrugated with

reticular hypomotility(1-2/3 minutes) or completely absent with fibrin threads and exudate extends all over the abdominal cavity.

4. Discussion

The observed clinical signs in cases of chronic diarrhea (Table 1) associated with acute diffuse TRP (rise of body temperature, pulse rate and in respiratory rate) are nearly similar to such reported by (*Divers and Peek, 2008, Ghanem 2010 and Hajjgharamani and Ghane, 2010*).

Chronic diarrhea that occurred in cases of acute diffuse peritonitis may be due to enteritis and this lead to diarrhea. Paralytic ileus is the end result of diffuse peritonitis and this may accompanied with diarrhea and or constipation, also withdrawal of fluid

from body to intestine due to GIT stasis leading to diarrhea and adhesion between intestine and internal viscera and this lead to diarrhea.

Hematological findings:

The Significant decrease in total erythrocytic count and Hb concentration (Table 2) in diseased animals indicates anemia, which could be attributed to the loss of blood during penetration of the reticulum or the chronic inflammatory process (*Ocal et al. 2008, Gokce et al., 2007 and Ghanem, 2010*).

The reported leukocytosis, neutrophilia and lymphopenia are supported by *Gocke et al. (2007) and Ghanem, 2010*.

Leukopenia appeared in one case only similar to that reported by (*Radostits et al., 2007*). Lymphopenia reported in these cases may be caused by endogenous corticosteroid release secondary to stress lead to cell redistribution, circulating lymphocytes don't re-enter the lymphatics but become sequestered in the lymphoid tissue and bone marrow (*Latimer et al., 2003*).

The increase in PCV% attributed by *Gocke et al. (2007) and Ghanem (2010)* to dehydration associated with fluid loss due to the reduction of food and water intake (*Rosenberger, 1979*).

Hypoproteinemia, hypoalbuminemia and hyperglobulinemia in diseased cases was also observed by *Saleh et al. (2008)*, who also indicated that increased globulin level not compensate for severe loss of albumin concentration.

Hyponatremia, hypokalemia and hypochloremia (Table 2) was also recorded by (*Sharma and Kumar, 2006 and Ghanem, 2010*)

Decreased potassium level caused by anorexia and potentiated slightly by ions exchange caused by metabolic alkalosis in these cases that cause exchange of the intracellular H⁺ ions for the extracellular K⁺ ions. Hypochloremia may be attributed to abomasal reflux into the rumen.

The increased haptoglobin and hyperfibrinogenemia (Table 2) were in agreement with those mentioned by *Ansari-Lari et al. (2008) and Ghanem (2008)*.

Haptoglobin and fibrinogen from the positive acute phase proteins that increase in response to challenge (*Murata et al., 2004 and Gruys et al., 2005*), this increased level may be attributed to enhanced hepatic synthesis as a result of a severe inflammatory process following foreign body penetration.

Ultrasonographic examination:

The normal reticulum appears as a half-moon-shaped with smooth contour and contracts three biphasic contractions per three minutes, these results previously mentioned by *Braun (2009b) and Ghanem (2010)*.

In diseased animals the foreign body that penetrates the reticular wall may cause acute local peritonitis, chronic local peritonitis, acute diffuse peritonitis, reticular abscesses or pleuro-pneumonia and pericarditis in cows and buffaloes.

Changes in the contour of the reticular wall (Thickening and corrugation), echogenic fibrin threads and anechogenic to hypoechogenic fluid seen on the reticular serosa and structures adjacent to the reticulum with reduction in the reticular biphasic contraction, these results similar to that reported by (*Braun 2003*).

Corresponding author

Abd El Khalek El Sheikh

Department of Animal Medicine, Faculty of Veterinary Medicine, Zagazig University

onetwovet@yahoo.com

References

- Abdelaal, A.M., Floeck, M., El Maghawry, S. and Baumgartner, W. (2009):** Clinical and ultrasonographic differences between cattle and buffaloes with various sequelae of traumatic reticuloperitonitis. *Veterinari Medicina*, 54: 399-406.
- Andrews, A.H.; Blowey, R.W.; Boyd, H. and Eddy, R.G. (2004):** *Bovine Medicine, Diseases and Husbandry of Cattle*. 2nd ed. Ames, Iowa: Blackwell Science Ltd: 835-839
- Ansari-Lari, M.; Nazifi, S.; Rezaei, M. and Asadi-Fardaqi, J. (2008):** Comparative study of plasma proteins including haptoglobin and serum amyloid A in different types of traumatic reticuloperitonitis in cattle. *Comparative Clinical Pathology*, 17: 245 – 249.
- Benjamin, M.M. (1978):** *Outline of veterinary Clinical pathology*. 3rd ed. The Iowa state university press Ames. Iowa, USA.
- Benjamin, M. M. (1979):** Fibrinogen. In *Outline of Veterinary Clinical Pathology Clinical Pathology*, 3rd ed. Ames. Iowa: The Iowa State University Press: 116-120.
- Bhattacharya, K.; Chakraborty, G.K. and Chakravarti, G. (1978):** *A Handbook of Clinical Pathology*. Academic Publishers: 96.
- Braun, U. (2009 b):** *Veterinary Clinics Of North America. Food Animal Practice. Ultrasonography of the Gastrointestinal Tract in Cattle*: 567-590.
- Braun, U. and Goetz, M. (1994):** Ultrasonography of the reticulum in cows. *American Journal of Veterinary Research*, 55: 325–332.
- Braun, U. Pusterla, N and Fluckiger, M. (1997):** Ultrasonographic findings in cattle with Pleuropneumonia. *Veterinary Record*, 141: 12-17.

- Cannon, D.C.; Olitzky, I. and Inkpen, J.A. (1974):** Proteins: In: Clinical Chemistry, Principles and Techniques, 2nd ed. Harper and Row, WB. Saunders, NewYork, 407-421.
- Chawla, H.S. (2003):** Practical Clinical Biochemistry: Methods and Interpretations. Jaypee Brothers Publishers: 228.
- Coles, E.H. (1986):** Veterinary clinical pathology. 4th Ed. W.B. Saunders Company, Philadelphia, London and Toronto: 305- 326.
- Divers, T.J. and Peek, S.F. (2008):** Rebhun`s Diseases of Dairy Cattle. 2nd ed. St Louis, Saunders Elsevier: 835-838.
- Duncan, D.B. (1995):** Multiple Range and Multiple F-Test. Biometrics, 11:1-42.
- Ghanem, M.M. (2010):** A comparative study on traumatic reticuloperitonitis and traumatic pericarditis in Egyptian cattle. Turkish Journal of Veterinay Animal Science, 34: 143-153.
- Gokce H.I.; Gokce, G. and Cihan, M. (2007): Alterations in Coagulation Profiles and Biochemical and Haematological Parameters in Cattle with Traumatic Reticuloperitonitis. Veterinary Research Communications, 31: 529–537.
- Götz, M. (1992): Sonographische untersuchungen an der haube des rindes [dissertation]. Zurich: Faculty of Veterinary Medicine, University of Zurich.
- Gruys, E; Toussaint, M.; Upragarin, N; Van ederen, A; Adewuyi, A; Candiani, D; Nguyen, T. and Sabeckiene J. (2005): Acute phase reactants, challenge in the near future of animal production and veterinary medicine. Journal of Zhejiang University Science, 6B. 10: 945-951.
- Hajjighahramani, S. and Ghane, M. (2010): Traumatic reticuloperitonitis in cattle of Khorramabad (Center of Lorestan Provenience, West of Iran). Global Veterinaria, 5: 135-139.
- Elson, E. C. (1974): Quantitative determination of serum haptoglobulin. American Journal of Clinical Pathology, 62: 655-663.
- Grant, G.H.; Silverman, L.M. and Christenson, R.H. (1987): Amino acids and proteins. In: Tietz, N.W., ed. Fundamentals of Clinical Chemistry. 3rd ed. Philadelphia, WB Saunders: 291-345.
- Kaske, M.; Midasch, A. and Rehage, J. (1994): Sonographic investigation of reticular contractions in healthy sheep, cows, and goats and in cows with traumatic reticulo-peritonitis. Journal of Veterinary Medicine, Series A, 41: 748–756.
- Kelly, W.R. (1984): Veterinary Clinical Diagnosis. 3rd ed. Baillere, Tindall, London.
- Latimer, K.S; Mahaffey, E.A. and Prasse, K.W. (2003): Duncan and Prasse`s Veterinary Laboratory Medicine: Clinical Pathology, 4th ed. Ames, Iowa State Press: 68-77, 152-160, 166-167.
- Murata, H.; Shimada, N and Yoshioka, M. (2004): Current research on acute phase proteins in veterinary diagnosis: an overview. The Veterinary Journal, 168: 28–40.
- Ocal, N., Gokce, G., Gucu, A.I., Uzlu, E., Yagci, B.B. and Ural, K. (2008): Pica as a predisposing factor for traumatic reticuloperitonitis in dairycattle: serum mineral concentrations and hematological findings. Journal of Animal and Veterinary Advances, 7: 651- 656.
- Radostits, O.M., Gay, C.C., Hinchcliff, K.W. and Constable, P.D. (2007): Veterinary Medicine. A Textbook of the Diseases of Cattle, Horses, Sheep, Pigs, and Goats, 10th ed. Saunders Elsevier, Philadelphia: 337-342, 349.
- Rosenberger, G.; Dirksen, G.; Grunder, H.D.; Grunert, E.; Krause, D. and Stober, M. O. (1979): Clinical Examination of Cattle. 2nd ed. Verlag paul. Berlin and Hamburg.
- Roth, L. and King, J. (1991): Traumatic reticulitis in cattle: a review of 60 fatal cases. Journal of Veterinary Diagnostic Investigation, 3: 52-54.
- Saleh, M.A., Rateb, H.Z. and Misk, N.A. (2008): Comparison of blood serum proteins in water buffaloes with traumatic reticuloperitonitis and sequellae. Research in Veterinary Science, 85. 2: 208-213.
- Schalm, O.W. (1979): Veterinary Haematology. 4th ed. Bailliere Tindall and Camel Ltd. London: 47-123.
- Sharma, M.C. and Kumar, P. (2006): Foreign Body Syndrome In Buffaloes (Bubalus bubalis): An Emerging Threat. Asian Journal of Animal and Veterinary Advances, 1: 89-98.
- Wintrobe, M.M. (1965): Clinical hematology 4th ed. Lea and Febigen, Philadelphia.

9/1/2012