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Research Article

EXAMINING THE LIPID PROFILES OF DAIRY CATTLE SUFFERED FROM CECUM IMPACTION

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ABSTRACT
Cecum impaction has been known as cases of intestinal obstruction in mature cattle. Cecum dilatation, with or without its twisting, occurs separately. The complication may be seen at any age but its most occurrence frequencies are in 4 to 7 years old cows. It seems that cecum dilatation occurs before its twisting. The reason of cecum dilatation is not clear but its pathogenesis is similar to the abomasum displacement as a result of granular dietary. The obstruction of cecum, colon, and/or rectum may cause dehydration without alkalosis. The aim of the present study is to examine the lipid profiles of dairy cattle suffered from cecum dilatation which can be used as factors for rapid diagnosis of cecum dilatation in industrial cow pens in order to prevent economical loses. In the present study after diagnosing of cecum dilatation of dairy cattle by rectal touching and clinical signs, 12 cows suffered from cecum dilatation and 12 healthy cows as control group were blood sampled. The sample serums were transferred to laboratory. The samples were analyzed using colorimeter, Pars Azmoon kits, auto-analyzer system (model Hitachi), and lipid profiles which consist of triglyceride, cholesterol, LDL, and HDL. Results showed that the average of lipid profiles' serum rate is higher in cattle suffered from cecum dilatation compared with healthy cattle; that was meaningful in case of TG and HDL and is unmeaning about CHL and LDL. This increasing is accountable considering dehydration because of anorexia.

Key Words: *Triglyceride, Cholesterol, LDL, HDL, Cecum Impaction, Cow*

INTRODUCTION
Cecum dilatation and its twisting cause intestinal obstruction. In ruminant it occurs as a result of various factors. Constrictive intestinal damages, intra-intestinal tumors, external pressures on intestine, and etc. are some causes of intestinal obstruction. Fibrotic tenacities and tumors cause intestinal tightening followed by obstruction. Also some factors such as sclerosis a part of intestinal following a surgery, sever manipulation of intestines, shock, peritonitis, prolonged and continuous intestinal dilatation, intestinal diverticulitis, intestinal obstruction when cesoever (signs of obstruction are decrease or lack of feces, progressive dilatation of abdomen, and stomachache) cause intestinal dilatation and twisting (Blowey, 1991).
The effects of intestinal obstruction are different based on type, location, and nature of obstruction. Most obstructions of initial part of small intestine cause more sever and acute syndrome compared with large intestine (Smith, 2002). Also it must be mentioned that small intestine and colon obstruction in single-hoof animals cause livestock death less than 24 hours while the same event in cattle doesn't cause the death before a week as well as cecum dilatation doesn't occur following obstruction. Intestinal dilatation and its twisting that cecum dilatation and twisting are part of which cause the loss of body fluids and in some more acute cases cause toxemia followed by cardiovascular consequences, peripheral blood circulation failure, and collapse (Radostits *et al.*, 2007; Nour-Mohamadzadeh, 1992). The aim of the present study is to examine lipid profiles changes in dairy cattle suffered from cecum dilatation.

MATERIALS AND METHODS
12 cattle with cecum dilatation and 12 apparently healthy cattle as control group were blood sampling following diagnosis of cecum dilatation in dairy cattle by rectal touching and clinical signs. The samples

were transferred to laboratory following to obtain their sera. The samples were analyzed using colorimeter, Pars Azmoon kits, auto-analyzer system (model Hitachi), and lipid profiles which consist of triglyceride, cholesterol, LDL, and HDL. Finally, obtained data were analyzed statistically using SPSS (Ver.15) and t test.

RESULTS AND DISCUSSION

Results

Based on the information of table 1 and according to U Mann-Whitney test it is observed that the average rate of TG in diseased cattle was 11.03±2.204 mg/dl and in healthy group was 7.39±2.36 mg/dl in which U=19.50, p=0.001, and reliability level = 97%. Therefore the observed difference in the average of TG between two understudied groups was meaningful and this rate was greater in diseased animals (p< 0.01).

Table 1: The average of TG serum rate in two groups (healthy and diseased cattle)

group	number	Average	U	P-value
diseased	12	11.03±2.20	19.50	0.001
Healthy	12	7.39±2.36		

U*: U Mann-Whitney test*

The average rate of Cholesterol in diseased cattle was 187.03±35.008 mg/dl and in healthy group was 162.97±35.38 mg/dl in which U=44, p=0.114, and reliability level = 95%. Therefore the observed difference in the average of Chl between two understudied groups was unmeaning (p<0.05).

Table 2: The average of Cholesterol in two groups (healthy and diseased cattle)

group	number	Average	U	P-value
diseased	12	187.03±35.008	44	0.114
Healthy	12	162.97±35.38		

The average rate of LDL in diseased cattle was 182.14±15.03 mg/dl and in healthy group was 174.94±12.31 mg/dl in which U=46, p=0.143, and reliability level = 95%. Therefore the observed difference in the average of LDL between two understudied groups was unmeaning (p>0.05).

Table 3: The average of serum LDL in two groups (healthy and diseased cattle)

group	number	Average	U	P-value
diseased	12	182.14±15.03	46	0.143
Healthy	12	174.94±12.31		

The average rate of HDL in diseased cattle was 201.91±8.42 mg/dl and in healthy group was 180.75±15.84 mg/dl in which U=16, p=0.001, and reliability level = 97%. Therefore the observed difference in the average of HDL between two understudied groups was meaningful and was greater in diseased cattle (p>0.01).

Table 4: The average of serum HDL in two groups (healthy and diseased cattle)

group	number	Average	U	P-value
diseased	12	201.91±8.42	16	0.001
Healthy	12	180.75±15.84		

Based on table 5 and Kruskal Wallis test it is observed that the mean rate of serum TG at 3, 4, 5, and 6 years old were 13.75± 1.56, 10.37±2.48, 10.73±1.59, and 9.83±- mg/dl respectively which was unmeaning based on x^2=4.08, meaningful level of p=0.253, and reliability level of 95% the observed difference in TG rate in various ages of diseased cattle (p>0.05).

Table 5: Comparison of serum TG average (mg/dl) in diseased cattle based on age

Age	number	average	X^2	df	P
3	2	13.75± 1.56	4.08		**0.253**
4	5	10.37±2.48		3	
5	4	10.73±1.59			
6	1	9.83±-			
total	12	11.03±2.204			

The mean rate of serum Chl at 3, 4, 5, and 6 years old were 193.95± 8.67, 170.45±47.59, 202.17±25.06, and 195.54±- mg/dl respectively which was unmeaning based on x^2=2.350, meaningful level of p=0.503, and reliability level of 95% the observed difference in Chl rate in various ages of diseased cattle (p>0.05).

Table 6: Comparison of serum Chl average (mg/dl) in diseased cattle based on age

Age	number	average	X^2	df	P
3	2	193.95± 8.67	2.350		**0.503**
4	5	170.45±47		3	
5	4	202.17±25.06			
6	1	195.54±-			
total	12	182.14±15.03			

The mean rate of serum LDL at 3, 4, 5, and 6 years old were 184.78±5.28, 174.05±19.57, 192.49±6.24, and 175.87± - mg/dl respectively which was unmeaning based on x^2=2.54, meaningful level of p=0.468, and reliability level of 95% the observed difference in LDL rate in various ages of diseased cattle (p>0.05).

Table 7: Comparison of serum LDL average (mg/dl) in diseased cattle based on age

Age	number	average	X^2	df	P
3	2	184.78±5.28	2.542		**0.468**
4	5	174.05±19.57		3	
5	4	192.49±6.24			
6	1	175.87± -			
total	12	182.14±15.03			

According to table 8 the mean rate of serum HDL at 3, 4, 5, and 6 years old were 199.18±15.909, 199.84±6.005, 207.51±7.68, and 195.29± - mg/dl respectively which was unmeaning based on x^2=3.33,

meaningful level of p=0.343, and reliability level of 95% the observed difference in HDL rate in various ages of diseased cattle (p>0.05).

Table 8: Comparison of serum HDL average (mg/dl) in diseased cattle based on age

Age	number	average	X^2	df	P
3	2	199.18±15.909	3.331	3	**0.343**
4	5	199.84±6.005			
5	4	207.51±7.68			
6	1	195.29± -			
total	12	201.91±8.42			

According to table 9 and Kruskal Wallis test it is observed that the average of serum TG rate on days 1, 2, 3, 4, 6 of disease onset were 10.63±**,** 11.04±2.08, 9.44±1.801, 11.99± 1.91, 14.86± - mg/dl respectively which was unmeaning based on x^2=5.45, meaningful level of p=0.244, and reliability level of 95% the observed difference in TG rate in various ages of diseased cattle (p>0.05).

Table 9: Comparison of the serum TG average (mg/dl) of diseased cattle based on disease onset

P	df	X^2	average	number	Disease onset
0.244	4	5.45	10.63±	1	**1ST**
			11.04±2.08	3	**2nd**
			9.44±1.801	34	**3rd**
			11.99± 1.91	3	**4th**
			14.86± -	1	**6th**
			11.03±2.204	12	**total**

The average of serum Chl rate on days 1, 2, 3, 4, 6 of disease onset were 165.61±, 186.03±55.21, 183.05±45.79, 200.22± 4.75, 187.82± - mg/dl respectively which was unmeaning based on x^2=2.205, meaningful level of p=0.698, and reliability level of 95% the observed difference in Chl rate in various ages of diseased cattle (p>0.05).

Table 10: Comparison of the serum Chl average (mg/dl) of diseased cattle based on disease onset

P	df	X^2	average	number	Disease onset
0.698	4	2.205	165.61±	1	**1ST**
			186.03±55.21	3	**2nd**
			183.05±45.79	4	**3rd**
			200.22± 4.75	3	**4th**
			187.82± -	1	**6th**
			187.03±35.008	12	**total**

The average of serum LDL rate on days 1, 2, 3, 4, 6 of disease onset were 190.51± -, 186.54±15.62, 174.27±21.78, 185.79± 8.88, 181.05± - mg/dl respectively which was unmeaning based on x^2=1.07,

meaningful level of p=0.898, and reliability level of 95% the observed difference in LDL rate in various ages of diseased cattle (p>0.05).

Table 11: Comparison of the serum LDL average (mg/dl) of diseased cattle based on disease onset

P	df	X^2	average	number	Disease onset
0.898	4	1.07	190.51± -	1	**1ST**
			186.54±15.62	3	**2nd**
			174.27±21.78	4	**3rd**
			185.79± 8.88	3	**4th**
			181.05± -	1	**6th**
			187.14±15.03	12	**total**

The average of serum HDL rate on days 1, 2, 3, 4, 6 of disease onset were 206.10± -, 202.45±7.901, 203.84±10.13, 194.56±6.301, 210.43± - mg/dl respectively which was unmeaning based on x^2=3.91, meaningful level of p=0.417, and reliability level of 95% the observed difference in HDL rate in various ages of diseased cattle (p>0.05).

Table 12: Comparison of the serum HDL average (mg/dl) of diseased cattle based on disease onset

P	df	X^2	average	number	Disease onset
0.417	4	3.91	206.10± -	1	**1ST**
			202.45±7.901	3	**2nd**
			203.84±10.13	4	**3rd**
			194.56±6.301	3	**4th**
			210.43± -	1	**6th**
			201.91±8.42	12	**total**

Discussion

Cecum dilatation and its twisting is a prevalent problem at industrial cow pens which imposes a great lose to owners, so fast and timely diagnosis can prevent economical losses. Although conclusive diagnosis is conducted by clinical signs, rectal touching, and laparectomy, laboratory tests are useful. It was recognized, by library searches and examining indices, which the only significant laboratory factors about the disease consist of the changes of serum electrolytes especially chlorine, potassium, as well as examination the changes of hematocrit in chronic condition; of course electrolyte disorders depends on obstruction location (Andrews, 1990; Martin, 1991). Obstruction near the duodenum and pylorus cause problems in passing abomasum secretions; so, result in hypochloremia, hypocalcaemia, metabolic alkalosis. Cecum, colon, or rectum obstruction maybe causes dehydration without alkalosis. If intestine affected by necrosis or rupture, acidosis will be occur because of blood circulation collapse which results in peritoneum inflammation and toxins absorption (Anderson, 1992; Matthews, 1991).

There is not a similar study about examination of serum lipid profiles which result in cecum dilatation. By reviewing the obtained results of the present study it was recognized that the average of serum lipid profiles in diseased cattle is higher compared with healthy cattle; that higher rate was significant about

TG, HDL, and unmeaning about cholesterol and LDL. The increase is accountable because of anorexia and dehydration. In a study aimed at determining serum lipid profiles affecting abomasum twisting in cattle there was a meaningful increase in serum cholesterol and LDL which confirms to the results of the present study except that the increase in the present study was not significant (Howard, 2000).

Also in a study on cecum dilatation and twisting of a 6 month Holstein cow, the increase of WBC rate and banded neutrophils was mentioned and there was no report about changes of serum biochemical factors except decrease in magnesium which is not confirmed with the findings of the present study (Radostits *et al.*, 2007). There was no significant difference in comparing the averages of understudied serum factors in diseased cattle considering their age, pregnancy and unpregnancy state, and the date of disease onset.

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