



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2016; 2(6): 467-470
www.allresearchjournal.com
Received: 05-04-2016
Accepted: 06-05-2016

Daminov Asadullo
Senior Scientific Researcher of
the Department of Animal
Diseases and Parasitology
Samarkand Agricultural
Institute, 77, M. Ulugbek
Street, Samarkand,
Uzbekistan, 140103

Morphological and biochemical indexes of trematodos in cattle's blood

Daminov Asadullo

Abstract

In the article is presented the analysis of blood research results to erythrocytes, leucocytes, hemoglobin, general protein, glucose, bilirubin and also the activation of AsAT (aspartate- aminotransferaza) and AlAT (alanin-aminotranspheraza) Ferments in cattle infection by lever and stomach- intestinal system trematodos.

Keywords: leverand stomach- intestinal system trematodoz, fasciolioz, parafistomotor, eritrocytes, leucocytes, hemoglobin, general protein, glucose, bilirubin, AsAT (aspartate-aminotranspheraza) and AlAT (alanin-aminotranspheraza) ferments activation.

1. Introduction

1.1 Significance of the problem

Invasive disease of domestic animals as well as trematodes of cattle limit the development of livestock farming and causes to implementation of target reforms in agrarian sector. In this regards, the investigation of trematodes of cattle occurring in liver as well as in the gastro-intestinal trucks and main clinic, hematologic, immunologic and other changes in different biogeocenoses of Uzbekistan has important significance

1.2 The level of investigation of problem

Investigation of immune status of organism caused by trematodos demands analyses of several indexes of blood such as morphological and biochemical, as well as erythrocytes, leucocytes, hemoglobin, content, T and B leucocytes, phagocytes, activity, general protein content enzymes wich gives significant information [3].

In case of cattle spontaneous fascilles the activities of cholinesterase, AsAt, AlAT a caline phosphatase is increased, but albumin, vitamin C and carotene contents decreased [5].

During fascilles of cattle it was stated the increase of content of eosinophil for 3 times, leucocytes content up to 56% as well as erythrocytes content for 32%, hemoglobin – 18,5% and the number of infuzoria content decreased for 16% [6].

During prolonged fascilliose of animals, the content of eosinophilia in blood was increased for 3 times, leucocytes content was increased up to 50% decreased, ketone bodies in urine, presence of pigments in the pancreatic liquid [8], as well as total number of erythrocytes, hemoglobin, total protein and albumin contents decrease was observed, α, β, γ globulin content increase, leucocytes and eosinophilia was also observed [2].

In the body of sheep infected by *Fasciola hepatica*, at the 19 days of experiment, it was detected the decrease of the content of erythrocytes, at the end of the experiment this index was $7, 2 \times 10^6 \text{ mm}^3$ [9].

According to another author, in the body of *Fasciola hepatica* caused sheep, it was observed a decrease of the ratio of albumin to globulin, as well as hyperglobulinemia and hypoalbuminemia.

The increase of some euryemes activities such as glutamate dehydrogenase and sorbitoldehydrogenasa in the serum of the blood of infected animals shows the presence of parenhumatoses. [10]

Correspondence

Daminov Asadullo
Senior Scientific Researcher of
the Department of Animal
Diseases and Parasitology
Samarkand Agricultural
Institute, 77, M. Ulugbek
Street, Samarkand,
Uzbekistan, 140103

In condition of Uzbekistan, it was observed of increase of bilirubin content, decrease of the activity of catalase, acetilcolinesterasa, total protein and sugar content in the blood of faciola gigantic caused animals.

During the faccilles of animals, the amino-acids of protein such as lysine, arginine, tyrosine was increased, the asparagine's and carotene content was decreased. AsAT, AIAT enzymes activities was increased, but the total content of protein was decreased. [1]

In the serum of blood content of infected animals, it was identified the decrease of total protein and its fractions significantly changed sharp intensive disease form of fascilles showed increase of the content of total protein, alpha and gamma globulin as well as the decrease of albumin and beta globulin (β-globulin), and decrease of total content of protein in the blood during this disease [7].

The review of available publications showed that in the different biogeocenoses of Uzbekistan it was not worked out the hematologic, biochemical and immunologic basics of trematodes of the livestock.

We started the investigation of this problem, to study to influence of F. gigantic during sharp and prolonged forms, as well as the morph biochemical indicators of blood in the gastrointestinal trematodes of animals.

1.3 The goals of experiment

The investigation of the total content of erythrocytes, leucocytes, hemoglobin, total protein, glucose and bilirubin, as well as the activities of enzymes AsAT, AIAT in the liver and gastro-intestinal trematodos (paramfistome) [4].

2. Materials and Methods

The experiments were conducted in the different region of Samarkand provinces during August, September of 2014, and May-June of 2015. The experimental sites were choose in the different livestock farms with severe manifestations of fascilles (F. gigantic) in the Past-Dargom district (private

farm “Ibragimov trading”. “Jonibek” and Bobur” farms). The part of the experemnts relited to gastro-intestinal trematodes were conducted in Taylak district (“Chubot”, “Elipak” farms). The breed of experimental animals ere “Krasnaya Stepnay” (Red Step) and land race with the age of 3-6 year. The five animals from each above mentioned farms were chosen for gelmintoscopic analyses as well as for comparison of clinical features of this degasses.

The investigation materials were taken from trematodos infected animals. There were used liver, gastro-intestine and blood samples for analyses.

There were used hematologic and biochemical analyses in the experiments.

2.1 Obtained results

The selected animals were severe infected by F. gigantic. Obtained eposotolic data shows that animals grazed in the river banks in the Samarkand province were infected by F. gigantic starting from August time. In the results, the infected animals shows clinical indicators to the end of the autumn with letall end to the winter time. For example, in 2016 at the end of the season, in January, in the liver of dead animal were isolated 1142 faciola bodies. 1030 from this number or 90.2% were F. gigantic, 112 examples were F. hepatica (9.8%). The 70.8% of F. gigantic were bodies with 5-28 mm immature bodies. All isolated F. hepatica bodies were mature forms. Based on this data it was possible to conclude that animal was died from sharp form of fascilles caused by F. gigantic.

The similar results were obtained from the part of experiment conducted in the farm of Past-Dargom region. More than 200 sheep were died from this problem at the end of December2014 and January 2015. The main problem of the death was fascilles initiated by F. gigantic.

Some results on blood morphologic and biochemical indexes of animals caused by liver trematodos in the farm of “Ibragimov trading” were shown in the table.

Table 1: Morphological and biochemical indicators of animals blood taken from liver trematodes caused animals grown in the “Ibragimov trading” farm

№	Indicators	amount	Time of analyses			
			During infection	Sharp form	Long period	P<
			2014 X	2014 IX	2015 V	
1	Hemoglobin g/l	99-129	94,83±4,5	87,66±4,1	86,0±5,6	0,001
2	Erythrocytes mln/mkl	5-7,5	4,45±0,10	4,16±0,07	4,08±0,08	0,001
3	Leucocytes ooo/mkl	4,5-7,0	6,60±0,75	6,61±0,8	6,10±0,6	0,05
4	Total protein g/l	72-86	67,8±1,4	66,0±1,5	63,4±2,31	0,01
5	Glucose Mmole/l	2,22-3,33	1,88±0,1	1,71±0,1	1,59±0,02	0,001
6	Bilirubin mkmmole/L	0,7-5,13	3,85±0,12	4,30±0,13	5,33±0,45	0,01
7	AcAT, Mmole/l	0,4-0,6	1,0±0,05	1,16±0,05	1,48±0,1	0,05
8	AIAT, Mmole/l	0,1-0,2	0,3±0,02	0,47±0,02	0,55±0,05	0,01

We can see from this table, that the animals caused by F. gigantic at the age 3-6 years at the initial stage of infection showed following blood composition: the number of erythrocytes were 4.45±0,10 thousand/mkl, leucocytes were 6,60±0,75 thousand/mkl, hemoglobin 94,83±4,5 total protein 67.8± 1,4g/l, glucose 1,88±0,1 Mmole/l, bilirubin 3,85±0,12 mkmmole/L activity of AcAT 1,0±0.05 Mmole/l S. L and AIAT activity 0,30±0.02 Mmole/l S.L.

The analyses conducted at the beginning of September on gelmintovoscopic type showed that, F. gigantic infection level was higher, the intensity of invasion was 196, 3±15,5 (from 141 to 277) numbers in average. In the sharp form of thrematodes the number of erythrocytes were 0,29 mln/mkl from 4,45±0,10 to 4,16±0,07mln/mkl) or 7,0%, hemoglobin

7,17g/l (94,83±4,5 up to 87,66±1,4 up to 66,0±1,5g/r) or 3,8% glucose content 0,17mmole/l (1,88±0,1up to 1,71±0,1 mmole/l) or 10,0% decrease, bilirubine-0,45mkmmol/l (3,85±0,12 up to 4,30±0,13 mkmmole/l) or 11,6%, AsAT activity- 0,16mmole s.l (1,0±0,05 up to 1,16±0,05mmole. S. l) or 16%, AIAT activity- 0, 17 mmole. s. l (0,3±0,02 up to 0,47±0.02 mmole. S.l.) or 56.0% decrease were shown.

In the prolonged form of disease there were more clear results. Especially, the number of erythrocytes was 0.37 mln/mkl. Or 9.0%, hemoglobin 8.83g/l, or 10.3%, total protein 4.4 g/l, or 7.0%, glucose- 0.28 Mmole/l, or 18.2% decrease compared to initial content was detected. The bilirubine – 1.58 mkmmole/l, or 38.4%, AsAT activity-0.487 mmole. S.l. or

48%, AlAT activity- 0.25 mmole. S.l or 83% increase were documented ($p < 0.01, p < 0.05$)
 Some results obtained in the part of the experiment conducted in “Jonibek” farm of Past Dargom district of Samarkand

province on morphologic and biochemical blood content of animals caused by liver thrematodes were shown in the table. 2

Table 2: Morphological and biochemical indexes of blood of animals caused by F. gigantic in the “Jonibek” farm

№	Indicators	amount	Time of analyses			
			During infection	Sharp form	Long period	P<
			2014 X	2014 IX	2015 V	
1	Hemoglobin g/l	99-129	87,1±0,95	78,9±1,27	77,2±1,1	0,001
2	Erythrocytes mln/mkl	5-7,5	4,48±0,08	4,20±0,06	4,02±0,13	0,001
3	Leucocytes ooo/mkl	4,5-7,0	5,47±0,3	5,51±0,4	5,53±0,35	0,01
4	Total protein g/l	72-86	68,6±1,75	64,42±1,33	60,43±1,75	0,001
5	Glucose Mmole/l	2,22-3,33	1,83±0,08	1,59±0,12	1,54±0,09	0,001
6	Bilirubin mkmmole/L	0,7-5,13	3,63±0,17	5,0±0,11	5,44±0,24	0,001
7	AcAT, Mmole/l	0,4-0,6	0,57±0,08	1,77±0,08	1,02±0,11	0,01
8	AlAT, Mmole/l	0,1-0,2	0,30±0,015	0,41±0,03	0,52±0,05	0,05

We can see from this table, that animals at the age of 3-6 years caused by F. gigantic at the initial stage of invasion, had the following blood content: average erythrocytes numbers was 4.48±0.08 mln/mkl, leucocytes 5.43±0.3thousands/mln, hemoglobin content- 87.1±0.95g/l, total protein-68.6±1.75g/l, glucose-1.83±0.08mmole/l, bilirubine-3.63±0.17mkmmole. S.L. Helminthoovoscopic analyses showed that intensity of invasion was in highest level, the average identified eggs number were 193.7±6. 9(171 up to 219).
 In the sharp form of disease the blood content of animals was as following: the average numbers of erythrocytes was decreased for 028 mln/mkl (4.48±0.08 up to 4.20±0.06 mln/mkl) or 6.6%, the hemoglobin content was decreased for 8.2 g/l (87.1±0.95 up to 78.9±1.27g/l) or 10.4%, total protein content was decreased for 4.18g/l(68.6±1.75 up to 64.42±1.33g/l) or 6.5% the glucose content was decreased 0.24mmole(1.83±0.08 up to 1.59±0.12mm) or 15.1%decrease, bilirubine-1.37 mkmmol/l (3.63±0.17 up to 5.0±0.4 mkmmole/l)

or 38%, AsAT activity-0.20 mmole. S.l (0.57 up to 0.77±0.08mmole. or 35.1%, and AlAT activity 0.11mmole s.l (0.30±0.015 up to.041±0.03mmole/s l or 37% increase were observed.
 Prolonged form of disease caused too many changes of blood content compared to initial stage. The decrease in some indexes were documented: for the average number of erythrocytes 0.42 mln/mkl, or 11.4% hemoglobin 99g/l, or 12.8%, total protein 8.17g/l or 12.8% total protein 8.17g/l or 13.5%glyukose 0.29mmole/l or 18.8%($p < 0.001$).
 At the same time some increase were obtained for the following indicators: bilirubin- 1.81mkmmole, or 50%, AsAT activity- 0.45mmole or 80% AlAT activity 0.22mmole or 73% ($p < 0.05$ up to $p < 0.001$).
 Morphological and biochemical indicators of blood of animals caused by F. gigantic grown in the “Bobur” farm were shown in the Table 3

Table 3: Morphological and biochemical indexes of blood caused by trematodos (F. gigantic) grown in “Bobur” farm

№	Indicators	amount	Time of analyses			
			During infection	Sharp form	Long period	P<
			2014 X	2014 IX	2015 V	
1	Hemoglobin g/l	99-129	92±2,98	88,3±2,66	84,0±2,82	0,001
2	Erythrocytes mln/mkl	5-7,5	4,9±0,24	4,48±0,21	4,0±0,22	0,001
3	Leucocytes ooo/mkl	4,5-7,0	5,43±0,31	5,54±0,43	5,10±0,33	0,01
4	Total protein g/l	72-86	62,0±0,71	61,14±0,70	58,4±1,2	0,05
5	Glucose Mmole/l	2,22-3,33	1,8±0,03	1,68±0,07	1,63±0,03	0,001
6	Bilirubin mkmmole/L	0,7-5,13	3,96±0,13	4,67±0,12	5,81±0,29	0,001
7	AcAT, Mmole/l	0,4-0,6	0,56±0,011	0,9±0,015	1,24±0,019	0,01
8	AlAT, Mmole/l	0,1-0,2	0,28±0,002	0,36±0,003	0,57±0,006	0,05

We can see from this table this table that animals at age 3-6 years censed by F. gigantic at the initial stage of infection the average numbers of erythrocytes in the blood were 4.9±0.24 mln/mkl, leucocytes 5.43±0.31 thousands/mkl, hemoglobin 92.9±2.98g/l, glucose 1.8±0,03 mmole/l, bilirubine-3.96±1.13 mkmmole/L, AsAT activity -0.56±0.011 mmole. S.l.
 Gelminthoovoscopic analyses of the same group of animals, caused by, F. gigantic, showed higher level of invasion, and parasitic numbers of eggs were in average 217.5±13. 6(174 upto 271).
 In the sharp form of disease the average number of erythrocytes decreased up to 0.42 mln/mkl (4.9±0.24 up to 4.48±0.21) or 9.4% hemoglobin 3.7g/l (92.0±2.98up to 88.3±2.66 g/l) or 4.2%, total protein -0.86 g/l (62.0±0.71 up to 61.14±0.73 g/l) or 1.5, glucose-0.12 mmole (1.8±0.03 up to 1.68±0.07 mmole/l)decrease, bilirubine-0.71 mkmmole/l (3.96±0.13 up to 4.67±0.12mkmmole) or 18% AsAT activity-

0.34 mmole, s.l (0.56±0.04up to 0.9±0.015mmole.s.l) or 60.7% and AlAT activity 0.08mmole s.l (0.28±0.002 up to 0.36±0.003 mmole.s.l or 28% decrease were observed.
 In the prolonged form of disease the average numbers of erythrocytes in the blood compared to initial stage decreased for 0.9 mln/mkl, or 22.5% hemoglobin -8.0 g/l, or 9.5%, total protein content 3.6 g/lor 6.0%, glucose-0,17 mmole/l or 10,5% decrease was observed, ($p < 0,001$) as well as bilirubin -1,85mkmmole/l, or 47% ($p < 0,001$) AsAT activity-0,68mmole s. l, or 22,4%, ($p < 0,01$), AlAT activity-0.19 mmole s. l or 20.2% ($p < 0,05$) increase was observed.
 Some parts of experiments were conducted in Taylak district, in the “Chubot” and “Elipok” private farms. The obtained results on morphological and biochemical blood content of animals caused by gastro-intestinal trematodos shown in the table 4.

Table 4: morphological and biochemical indexes of blood caused by gastro-intestinal trematodos (“Chubot” and “Elipok” private farms)

№	Indicators	amount	Time of analyses			
			During infection	Sharp form	Long period	P<
			2014 X	2014 IX	2015 V	
1	Hemoglobin g/l	99-129	90,7±1,82	88,1±2,53	81,6±3,16	0,001
2	Eritrocytes mln/mkl	5-7,5	4,41±0,2	4,2±0,23	3,86±0,15	0,001
3	Leucocytes ooo/mkl	4,5-7,0	6,83±0,36	6,94±0,33	6,53±0,43	0,05
4	Total protein g/l	72-86	65,1±1,21	64,3±1,42	60,6±2,25	0,01
5	Glukosa Mmole/l	2,22-3,33	1,85±0,01	1,66±0,01	1,54±0,01	0,001
6	Bilirubine mkmole/L	0,7-5,13	2,31±0,1	2,54±0,08	3,37±0,3	0,01
7	AcAT, Mmole/l	0,4-0,6	0,66±0,03	0,71±0,06	0,86±0,06	0,05
8	AlAT, Mmole/l	0,1-0,2	0,23±0,03	0,31±0,07	0,39±0,06	0,01

We can see from this table, that the animals at the age 3-6 years caured by gastro-intestine trematodos infection at early stage had a flowing blood content: average erythrocytes number 4,41±0,20 mln/mkl, leucocytes- 6,83±0,36 thousands/mkl, hemoglobine-90,7±1,82 g/l total protein 65,1±1,21g/l, glucose 1,85±0,01 mmole/l, bilirubin 2,31±0,1 mk.mole, AsAT activity- 0,66± 0,33 mmole/ s.l and AlAT activity – 0,23±0,03 mmole/s.l.

Gelmintooscopic analysis showed, that animals from private farms had higher invasive level of gastro-intestinal trematodose (paramphistomum). In each case the number of isolated eggs in average was 1667, 7±26,4(65 up to 264).

In the sharp form of this disease erythrocytes numbers in blood was in average 0,21mln/mkl(4,41±0.20 up to 4.20±0.23 mln/mkl) or 5% lower to initial stage, hemoglobine-2.6g/l(90.7± 1.82 up to 88.1±2.53g/l)or 14.3% of decrease, total protein -0.8g/l (65.1±1.21 up to 64.3±1.42 g/l) or 1.3% of decrease, glucose - 0.19 mmole (1.85±0.01 up to 1.66±0.07 mmole/l) or 11.4% of decrease, bilirubin-0.23mkmole/l (2.31±0.1 up to 2.54±0.08mkmole/l) or 7.2% of increase, AsAT activity-0.05mmole s.l. (0.66±0.13 up to 0.71±0.06mmole/s.l) or 7.5% and AlAT activity-0.08 mmole/s.l (0.23±0.03 up to 0.31±0.07 mmole s.l) or 35%pf increase can be seen.

In the form of prolonged disease erythrocytes content was decreased 0.55mln/mkl or 14.2% hemoglobin -9.1 g/l ($p<0.001$) or 11.2%, total protein -4.5g/l, or 7.5%, glucose - 0.31 mmole/l, or 21% of decrease, ($p<0.001$) as well as bilirubine -1.06 mkmole/l ($p<0.01$) or 46%, AsAT activity - 0.20 mmole/s.l ($p<0.05$) or 30.3%, alAT activity 0.16 mmole/s.l ($p<0.01$) or 70% of increase were detected.

The causes of such changes during influence of trematodoses can be explained by effect of parasitic trematodoses living in liver and gastro-intestinal tracks of host organisms, and consequently, taking part homophobes, as well as the function of liver to synthesize a protein, glycogen, bilirubin conjugation and production of enzymes.

All above mentioned changes were consequences of negative effect of trematodoses.

3. Conclusion

1. The infection level of the animals by *F. gigantica* from livestock farm from Past Dargom district was as higher as 193± 6, 9 -217,5±13,6), in Taylak district private farms this index was equal to 167,7±26,4.
2. the blood content of the animals caused by *F. gigantica* had changed: for example some decrease was detected for average number of erythrocytes -6.6-9.4%, hemoglobin, 4,2-10,4%, total protein 1,5-6,5% and glucose 10-15,1% at the same time some increase was detected for bilirubin 11,6-38,0% AsAT activity 16,0-60,7%, AlAT activity 28-56%. In the prolonged form of disease the average number of erythrocytes decreased to 9,0-22,5%,

hemoglobin 9,5-12,8% total protein 6,0-13,5% glucose 10,5-18,8% as compared to initial stage of experiment. At the same time bilirubin 38,4-50,0%, AsAT activity 48-221,4% and AsAT activity 73-202% increase were detected.

3. Animals caused by paramphistom during sharp period of disease had a follow in blood content: average erythrocytes number 5% hemoglobin 14,3%, total protein 1,3% and glucose 11,4% of decrease as well as bilirubin 7,2%, AsAT activity 7,5%, AlAT activity, 35% increase. In the prologues form of disease the number of erythrocytes 14,2% hemoglobin 11,2% total protein 7,5% glucose 21% decrease were detected, as well as bilirubin increased up to% AsAT activity for 30,3%, and AlAT activity for 70%.

4. Reference

1. Asanov S. Biochemical– 1973, 17.
2. Zubov AV. Vliyanie trematod na kolichestvenniy i kachestvenniy sostav infuzoriy predjeludkov i sravnitel'naya effektivnost antgel'mintikov pri fassioleze i paramphistomatoze krupnogo rogatogo skota // Avtoref. diss. kand. vet. nauk. Moskva. 2002, 16.
3. Kolyakov YA. E Veterinarnaya immunologiya, Moskva, Agropromizdat, 1986, 240.
4. Kondraxin IP. Klinicheskaya laboratornaya diagnostika v veterinarii. M.: Agropromizdat. 1985, 288.
5. Pushkaryov AS. Patogenez pri spontannom fassioleze krupnogo rogatogo skota // V sb. nauch. trudov. «Ekologicheskaya parazitologiya ». Ivanova. 1998, 35-36.
6. Sadchikov SYU, Vliyanie F. hepaticana nekotorie fiziologicheskije pokazateli korov pri xranicheskofassioleze // Trudy Mosk. gos. akad. vet. med. ibiotexnol. – M. 1998, 104-106.
7. Salimova M. Voprosi klinika i patogeneza fassioleza idikrotselioza karakulskix oves. Avtoref. diss. kand. vet. nauk. – Samarkand, 1972, 18.
8. SHemyakova SA. Immunokorregeruyushaya terapiya pri fassioleze krupnogo rogatogo skota. – Avtoref. diss. kand. vet. nauk. M. 1996, 26.
9. Said B, Dorchie P. Fasciolose ovine etude de Pandemic et de la protein emic an coues dune infestation naturally et aprestraintment // Rev. Med. Veter. 1986; 8-9:611-615.
10. Naroun EM, Ladin H. Studies on naturally occurring ovine fascioliasis in the Sudan // J Helminthol. 1986, 1:47-53.