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Estimation of serum protein and bilirubin level in goat (*Capra hircus*) in various hepatic lesions

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Abstract

For study on estimation of serum protein and bilirubin was conducted on 67 serum samples (10 serum samples collected from healthy goat as control group and 57 serum samples from affected goat that were showing various hepatic lesion) in and around Bikaner district. In comparison with healthy control group of goat, The mean values of total serum protein were decreased significantly ($p < 0.01$) in all goat with different hepatic lesions. There was also significant ($p < 0.05$) decrease in serum total protein was observed in goat with congestion as compared to healthy control group. The mean values of serum albumin were decreased significantly ($p < 0.01$) in goat with different hepatic lesion. The mean values of serum globulin were increased significantly ($p < 0.01$) in goat affected with fatty liver and increased non significantly in goat affected with congestion. significant ($p < 0.01$) increase in mean values of total bilirubin was observed in various hepatic lesions viz; parasitic hepatitis, congestion, haemorrhage, fatty liver, and necrosis.

Keywords: Serum, hepatic lesion, protein, bilirubin

Introduction

Liver is one of the most important organs in body and any insult of infectious, nutritional or toxic origin may cause hepatic damage and bring about functional and morphological changes. There may be alteration in concentrations of serum protein and bilirubin. Their estimations constitute the clinical and pathological diagnosis of liver disease. Laboratory biochemical tests are used for confirmation, to assess the severity of liver disease, to establish prognosis, to define treatable causes of the complications of hepatic insufficiency and to monitor the progress of hepatic disease. In the present study, Total protein, Albumin, Globulin and Total bilirubin were estimated from goat showing different hepatic lesions.

Materials and Methods

In the present study blood samples were collected from 10 serum samples collected from healthy goat as control group and 57 serum sample collected from affected goat that were showing various hepatic lesions in and around Bikaner district. Blood samples were collected from the jugular vein of goat before slaughter at the slaughter house in a vacutainers tube without anticoagulant being confirmed after the slaughter of animal based on lesion, the collected blood was taken or discarded. Serum was separated from blood by making the blood slant and incubated at 37 °C for 1 hr. Blood clots were broken and tubes were centrifuged at 2500 rpm for 30 minutes. Serum was pipette out into a small Pyrex tube. The centrifuged serum was preserved in deep freezing at -20 °C for further studies. Serum samples were analyzed for total protein, albumin, globulin and bilirubin by IDEXX kit method. The data obtained from both apparently healthy and diseased goat were analyzed by using appropriate statistical method students t-test using the SPSS software version-20.

Results and Discussion

Table 1: Total serum protein

Group	Total Protein(G/DL)	Albumin (G/DL)	Globulin (G/DL)	Bilirubin (Mg/DL)
Control (10)	6.74 ± 0.12	3.96 ± 0.06	2.78 ± 0.06	0.37 ± 0.18
Hydatidosis (4)	5.27 ± 0.18**	2.60 ± 0.29**	2.67 ± 0.11ns	0.54 ± 0.04**
Congestion (12)	5.98 ± 0.19*	2.73 ± 0.11**	2.95 ± 0.07ns	0.48 ± 0.16**
Haemorrhage (6)	5.19 ± 0.19**	2.86 ± 0.20**	2.33 ± 0.01**	0.53 ± 0.12**
Necrosis (7)	5.06 ± 0.21**	2.56 ± 0.17**	2.50 ± 0.04**	0.45 ± 0.21**
Abscess (12)	5.17 ± 0.14**	2.76 ± 0.24**	2.41 ± 0.10**	0.49 ± 0.13**
Fatty Change (16)	5.30 ± 0.19**	2.13 ± 0.22**	3.17 ± 0.03**	0.57 ± 0.27**

*Significant at $p < 0.05$ and ** Significant at $p < 0.01$, NS

Total serum protein (g/dl)

The mean ± S.E. values of total serum protein in control and goat with different hepatic lesions are shown in Table. The mean values of total serum protein were decreased significantly ($p < 0.05$) in all goat with different hepatic lesions. There was also significant ($P < 0.05$) decrease in serum total protein was observed in goat with congestion as compared to healthy control group.

Serum albumin (g/dl)

The mean ± S.E. values of serum albumin are depicted in Table. The mean values of serum albumin were decreased significantly ($p < 0.05$) in goat with different hepatic lesion.

Globulin (g/dl)

The mean ± S.E. values of globulin are depicted in Table. The mean values of serum globulin were increased significantly ($p < 0.05$) in goat affected with fatty liver.

The mean values of serum globulin were increased non significantly in goat affected with congestion.

The mean values of serum globulin were decreased significantly ($p < 0.05$) in goat affected with hemorrhage, necrosis and abscess.

The mean values of serum globulin were decreased non significantly in goat affected with hydatidosis.

Bilirubin (mg/dl)

The mean ± S.E. values of total bilirubin are presented in Table. significant ($p < 0.05$) increase in mean values of total bilirubin was observed in various hepatic lesions viz; parasitic hepatitis, congestion, haemorrhage, fatty liver, and necrosis.

Conclusion

Hepatopathy associated with chronic conditions (Fibrosis, Lipidosis, Neoplasia), toxic plant or metal toxicity, parasites and other pathogens cause liver damage by destruction of hepatocytes resulting into reduced protein synthesis. significant ($p < 0.05$) decrease in total serum protein and albumin in- all goat with different hepatic lesions was observed in the present study, similar findings was observed by Nath and Pathak (1996) [7]. Liver is a main organ, which is responsible for synthesis of protein. Albumin is synthesized exclusively in the liver, the most abundant of plasma protein. Hypoalbuminemia is usually associated with chronic liver disease s i.e. cirrhosis. Hypoalbuminemia may be a clinical sign of severe hepatocellular liver disease, because of marked destruction and disintegration of liver parenchymatous tissues, there may be defective albumin synthesis. The mean values of serum globulin were increased significantly ($p < 0.05$) in goat affected with fatty

liver. The mean values of serum globulin were decreased significantly ($p < 0.05$) in goat affected with haemorrhage, necrosis and abscess. The mean values of serum globulin were increased non significantly in goat affected with congestion. The mean values of serum globulin were decreased non significantly in goat affected with hydatidosis. There was significant ($p < 0.05$ or $p < 0.05$) increase in total bilirubin in goat with different hepatic affections as compared to healthy control goat. Increase in total bilirubin may be due to interference of biliary excretion due to damage hepatocytes, excessive intravascular destruction of erythrocytes.

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