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Occurrence, histopathology and serum protein and bilirubin analysis of liver hydatidosis in goat

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Abstract

In the current study, 1248 goat liver samples from different age groups, sexes, and breeds were evaluated in Bikaner. 216 liver samples from these 1248 specimens that were thought to have abnormalities were further processed for histological analysis. 17.3% was found to be the overall incidence of several clinical diseases. Out of the 216 hepatic lesions evaluated in the current investigation, hydatidosis was found in 6 total livers with an incidence of 2.77 percent. Grossly, the centre of the liver is home to a single, variable-sized hydatid cyst. For research on serum protein estimation 10 serum samples from healthy goats were obtained as the control group, and 57 serum samples from goats with various hepatic lesions were collected. Of these affected samples, 4 serum samples from goats with hydatidosis were included in this study. The value of total protein and albumin was highly significant ($p < 0.01$) lower in hydatidosis-affected animals compared to the healthy control group of goats. While there was a non-significant drop ($p < 0.01$) in globulin in the hydatidosis group compared to the liver of the healthy animal control group.

Keywords: Hydatidosis, liver, occurrence, goat

Introduction

Hydatidosis is a zoonotic illness that develops in the liver as a result of infection with the larval stages of the *Echinococcus granulosus* tapeworm. Significant economic and public health problems are brought on by hydatidosis. Condemnation of an infected liver results in financial losses. Humans and other specific hosts contract diseases when they consume contaminated liver. For ruminants, serum biochemical tests, notably those that measure serum protein, are useful for determining the extent of hepatocellular damage and tracking the progression of disease. The liver is the only organ where albumin is entirely made. Chronic liver disorders are typically accompanied with hypoalbuminemia. Because of the pronounced destruction and disintegration of the liver parenchymatous tissues, there may be a deficit in albumin synthesis, which could be a clinical indicator of severe hepatocellular liver disease (Kaneko *et al.*, 1997) [12]. Increased intravascular erythrocyte destruction and damaged hepatocytes may interfere with biliary excretion, which could explain the rise in total bilirubin.

Materials and Methods

The research was carried out between January 2020 and December 2020. Goat liver tissue samples are gathered from slaughterhouses in Bikaner and the surrounding areas of these districts for the proposed inquiry. Additionally, tissue samples were taken from goat corpses that had been delivered to the CVAS, Bikaner, department of Veterinary Pathology for post mortem analysis. Also included are the samples the field veterinarian provided. After the samples were collected, all of them were adequately preserved in 10% formalin by chopping off the damaged areas. The portion of the tissues that were impacted, which was 2-5 mm thick and displayed the lesions with normal tissue, was used for fixation and additional histological analysis. The tissue sample was washed in tap water overnight, dehydrated in ethyl alcohol of increasing strength, cleaned in xylene, and then embedded in paraffin. Hematoxylin and eosin were used to stain the section, which was cut at a thickness of 4-6 microns. Microphotographs and a physical examination were used to record the results.

In the current investigation, blood samples were taken from 57 serum samples taken from affected goats that were displaying various hepatic lesions, as well as 10 serum samples taken from healthy goats as the control group. Four goat samples with hydatidosis were taken from these affected goats and used in this study. sample gathered in and around the district of Bikaner. Before the goat was killed at the slaughterhouse, blood samples were extracted from its jugular vein in a vacutainers tube without an anticoagulant being proven. Based on the animal's lesion, the blood was then taken or rejected. By slanting the blood, serum was isolated from the blood and incubated at 37 °C for one hour. Blood clots were dislodged, and tubes were centrifuged for 30 minutes at 2500 rpm. A little Pyrex tube was used to pipette out the serum. For additional research, the centrifuged serum was kept in deep freezing at -20 °C. By using the IDEXX kit method, serum samples were examined for total protein, albumin, globulin, and bilirubin levels. Students used the t-test, an appropriate statistical tool, to analyze the data from both the apparently healthy and the ill goats, using SPSS software version 20.

Results and Discussion

Grossly Middle of the liver has a single, variable-sized spherical hydatid cyst (Fig. 1). A hydatid cyst has a soft consistency and contains 2-3 cc of clear fluid. Hydatid cyst that has been caseated and contains a thick, creamy paste. The liver had a solid texture. Under a microscope, a hyaline wall and fibrous capsule surround a cystic region filled with clear watery fluid, as well as lymphocyte infiltration (Fig. 2). The surrounding parenchyma displayed atrophy as a result of the cyst's pressure, and the sinusoidal gap disappeared (Fig. 3). A fibrous capsule surrounds the caseated mass in the core of a caseated hydatid cyst. At the junction of caseated mass and the fibrous capsule. Inflammatory cells, primarily lymphocytes, were present. A variety of degenerative alterations can be seen in the hepatic parenchyma, including the depletion of numerous hepatocytes brought on by cyst pressure and the growth of fibrous connective tissue. (g/dl) Total serum protein The drop in mean total serum protein levels from 6.74 0.12 g/dl in non-infected goats to 5.27 0.18 g/dl in hydatidosis-infected goats was very significant ($p < 0.01$), according to the mean S.E. value. (g/dl) serum albumin The mean S.E. value showed a highly significant ($p < 0.01$) decline in albumin mean values from 3.960.06 g/dl in uninfected goats to 2.600.29 g/dl in hydatidosis-infected goats. Globulin (g/dl) In comparison to the healthy control group, the mean S.E. values of serum globulin were 2.78.06 g/dl in the non-infected to non-significant drop ($p < 0.01$) 2.670.11 g/dl in the case of hydatidosis. (mg/dl) Bilirubin The rise in mean serum bilirubin values from non-infected goats (0.370.18 mg/dl) to infected goats (0.540.04 mg/dl) was very significant ($p < 0.01$), according to the mean-S.E. value.

Table 1: Total protein, Albumin, Globulin and Bilirubin

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±.06	0.37±0.18
Hydatidosis (4)	5.27± 0.18**	2.60±0.29**	2.67±0.11NS	0.54±0.04**

NS Non significant at $p < 0.01$ and ** Significant at $p < 0.01$



Fig 1: Gross specimen of liver containing smooth wall cut surface of hydatid cyst

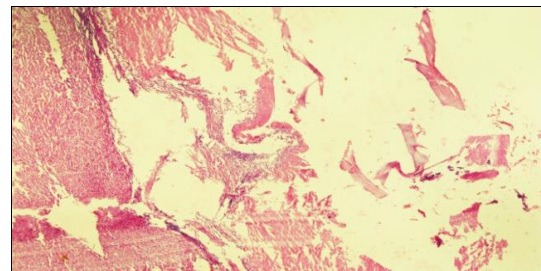


Fig 2: Photomicrograph showing hydatid cyst wall. H&E 40X

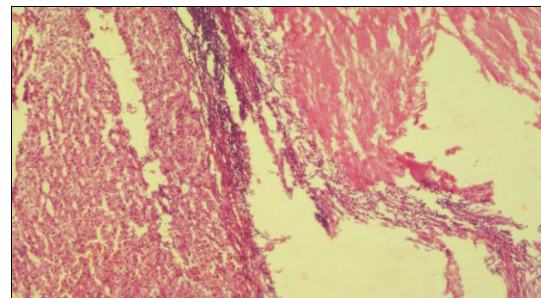


Fig 3: Photomicrograph showing severe infiltration in cyst wall, degeneration of hepatic cells and disappearance of sinusoidal space due to pressure of the cyst. H&E 100X

Conclusion

Hydatidosis was discovered in 6 total livers out of the 216 hepatic lesions assessed in the current study, with an incidence of 2.77 percent. Papov (1967) [15] and Jithendran (1996) [13] both reported comparatively high incidences of 21.2% and 19.45%, respectively, in contrast to the current data. Yadav and Ahluwalia (1971) [14] found an incidence of 3.1%, which is comparable to the findings of the current investigation. This variance in occurrence may be caused by elements including age, breed, area, environmental elements, and management techniques in the different study locations. According to the mean S.E. value, the decrease in mean total serum protein levels from 6.74 0.12 g/dl in non-infected goats to 5.27 0.18 g/dl in hydatidosis-infected goats was extremely significant ($P < 0.01$). Similar findings were reported by Ramazan *et al.* in 2003 [8]. The liver is a key organ in the synthesis of proteins. Hepatocyte loss, which reduces protein synthesis, is what causes the liver damage brought on by chronic parasite infection. According to the mean-S.E. value, the increase in mean serum bilirubin values from non-infected goats (0.370.18 mg/dl) to infected goats (0.540.04 mg/dl) was extremely significant ($P < 0.01$).

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