

Health Hazards in Goats Due to Bezoars Formation

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Abstract- Bezoars were isolated from gastrointestinal tract of certain goats and they were used for the treatment of ailments like snake bite, old age, plague, high fever, convulsion, stroke, epilepsy and evil spirits as it was believed that bezoars had healing powers. Bezoars are classified according to the materials which they are composed. In view of the lack of information and owing to importance of the problem towards medicine preparations and its health hazards the present study has been undertaken. The aim of the present study was to evaluate the hematological, histopathological and biochemical changes in goats due to bezoars formation. The hematological and biochemical analysis indicate the formation of bezoars caused significant influence on different blood parameters which intern lead to functional and structural alterations at cellular level as evidence by the histopathological changes observed.

Index Terms- A.indica, Antidote, Bezoars, Hematology, Histopathology

I. INTRODUCTION

Bezoars are tightly packed collection of partially digested or undigested material stuck in the stomach or other parts of the digestive tract. The word “bezoar” or “badzer” which means anti-dote or counter-poison, animal bezoars were widely used in medicine until 18th century (Dietrich, 1985, De backer 1999 and Bowden, 1983). Arabs and Persians had the strange fortune of consuming in large quantities as having medical properties (Goldman et al 1998 and Mc loughlin, 1979 and Zarling et al 1984). In the past bezoars were isolated from the gastrointestinal tract of certain goats and sheep and preserved to be used as medicinal charms (Andrus 1989). It was believed that bezoar has the power of universal antidote against many poisons including snake bite. Bezoar is widely reputed antidote in traditional medicine among Irania tribes and is mostly used orally (Warell, 1976). Alam (1998) showed that the anti-snake venom activity of bezoar is composed to its plant material non-digestible by humans including cellulose, hemicelluloses, lignin and fruit tannins (Balik, 1993 and Holloway, 1980). In high concentrations, fruit tannins may form a coagulum upon exposure to an acidic environment initiating the formation of phytobezoars (Mastue, 1978 and Izumi, 1993). Information pertaining to physiological and hematological changes in goats due to bezoars formation is not available.

II. MATERIALS AND METHODS

The present study has been under taken in Regonda mandal, Warangal district, A.P. The formers of this area and parents of

one of the authors have been rearing bezoar goats for the last 20 years. With this vast experience the authors have inspired to undertake this work. The study extended for 3 years involving selection of area, type of feeding, bezoar formation, hematological and physiological changes in goats due to bezoars formation.

The local available goats (1-2years old) have been selected for the experiments. After feeding with A. indica dried fruits, goats were provided specific plant material (leaves of Bridelia, Chloroxylon and Holarrhena) for 90-120 days. During this period bezoars were formed. Blood samples were collected from bezoar and non-bezoar goats to assess the hematological abnormalities and biochemical changes.

III. RESULTS

HEAMATOLOGICAL CHANGES:

RBC'S count was 2.18 ± 0.9 mil/cmm in non-bezoar goats while it was 2.04 ± 0.5 mil/cmm in bezoar goats (Fig: 1). Haemoglobin percentage was also decreased in bezoar goats (6.6 ± 1.2 gms %) when compared to non- bezoar goats (7.4 ± 1.5 gms %). Decreasing of RBCs and hemoglobin in bezoar goats indicates physically weak sometime falls to disease. The platelet count was $3,00,000 \pm 6,500$ /cmm in bezoars goats and $2,45,00 \pm 5,550$ /cmm in non bezoar goats (Fig:3). Neutrophils, eosinophils and lymphocytes were decreased in bezoar goats when compared to non-bezoar goats. $41 \pm 6\%$ of lymphocytes were present in bezoar goats and $65 \pm 9\%$ were found in non bezoar goats. This indicates reducing the immunity in bezoar goats. $29 \pm 4\%$ neutrophils and $4 \pm 1.5\%$ eosinophils were found in bezoar goats and $55 \pm 8\%$ neutrophils and $6 \pm 3\%$ eosinophils were present in non – bezoar goats. Only monocytes and basophils percentage is increased in bezoar goats when compared to non-bezoar goats (Fig: 2).

The bilirubin levels significantly elevated in bezoar goats over non-bezoar goats. The increased bilirubin levels indicate significant breakdown of RBC, which is also noticed in the present study. The elevated levels of bilirubin in the present study conform the prevalence of anemia which was also supported by the decreased RBC, Hb levels. The total erythrocytes count and percentage of hemoglobin were significantly reduced with an evaluation of total leucocyte count in bezoar goats.

BIOCHEMICAL CHANGES:

The levels of total cholesterol and other lipid profiles were not abnormal in bezoar and non-bezoars goats (Fig, 4.) But in bezoar goats when compared to non bezoar goats, total cholesterol, triglycerides, HDL- C, VLDL – C and LDL –C were high. The increase of 47 ± 7 mg/dl to 65 ± 7 of total cholesterol, 44 ± 5 to 50 ± 7 of HDL-C, 1 ± 0.4 to 9.4 ± 2.5 LDL –C and 10 ± 3.5

to 28 ± 6.2 mg/dl of triglycerides were found in non bezoar and bezoar goats.

Total proteins, serum albumin and globulin levels are not significant (Fig. 5). Total protein content in bezoar goats was 7.9 ± 2.5 gms/dl and 6.7 ± 1.6 gms/dl in non bezoar goats. 4.5 ± 1.0 gms/dl serum globulin was present in bezoar goats and 3.4 ± 1.2 gms/dl was present in non bezoar goats. Serum globulin increase in bezoar goats was 4.5 ± 1.0 gms/dl. This indicates the change in total proteins and serum globulin by formation of bezoars.

In the present study serum creatinine level in bezoar goats (0.4 ± 0.1 mg/dl) decreased when compared to non bezoar goats (0.8 ± 0.1 mg/dl). There is no significant change in blood urea (Fig: 6) and FBS in bezoar and non bezoar goats. The concentration of urea in blood slightly high (i.e., increased 24 ± 4.5 mg /dl to 26 ± 3.2 mg/dl). It may be due to increased protein catabolism. In this study, the FBS levels in bezoar goats (40 ± 5.5 mg/dl) decreased when compared to non-bezoar goats (63 ± 9.2 mg/dl). The decreased glucose levels may be due to inhibition in biosynthesis of glucose by formation of bezoars.

HISTO PATHOLOGICAL CHANGES:

On histopathological examination in bezoar goats, change in liver and the major lesions were noticed (Fig. 7a, 7b.). In liver

secondary biliary cirrhosis is produced by obstruction of extra-hepatic biliary ducts and is characterized by regeneration nodules, surrounded by fibrous septa. In these nodules, regenerating hepatocytes were disorderly disposed. Biliary tract, central vein and radial pattern of hepatocytes are absent. Severe histopathology changes were observed in the kidney of the bezoar goats. Damage in the structural organization of kidney with lesions like cystic dilation and degeneration of tubules were observed in bezoar goats. In addition almost all glomeruli are enlarged due to proliferation of endothelial cells and mesangial cells, swelling of endothelial cells and inflammatory infiltrate. This will result in compression of capillaries and bowman space in which reduced in size (Fig.8a & 8b).

In the stomach of bezoar goats inflammatory fibroid polyp appeared. The characteristic features of inflammatory fibroid polyp include concentric fibrosis around vessels, scattering of eosinophils and lymphoid nodules. Some of the bezoar goats' stomach observed chronic peptic ulcer which is a mucosal defect which penetrates the muscularis mucosa and mucularies propria, produced by acid-pepsin aggression ulcer margins are perpendicular and present chronic gastritis (Fig 9a & 9b).

Identify the constructs of a Journal – Essentially a journal consists of five major sections. The number of pages may vary depending upon the topic of research work but generally comprises up to 5 to 7 pages.

FIG: 1. RBC COUNT IN BEZOAR AND NONBEZOAR GOATS



FIG: 2. WBC COUNT IN BEZOAR AND NON-BEZOAR GOATS

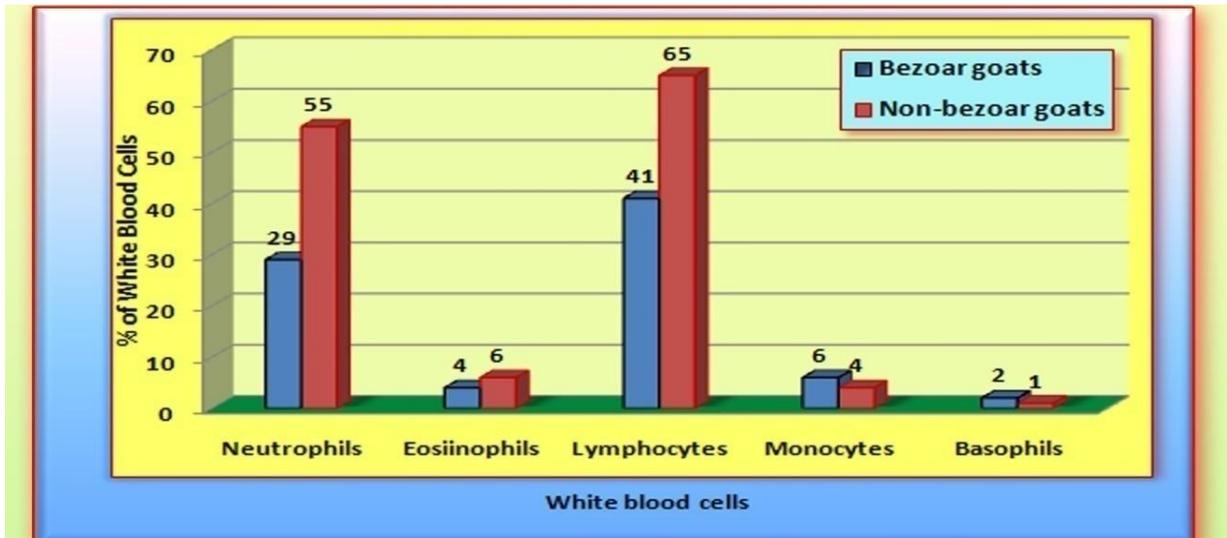


FIG: 3. PLATELETS COUNT IN BEZOAR AND NONBEZOAR GOATS

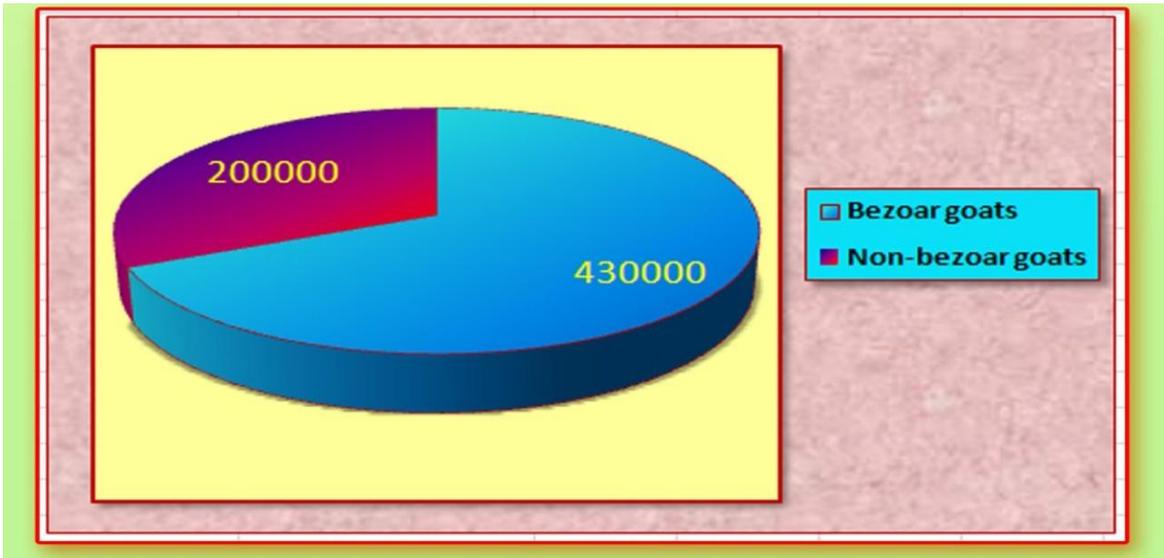


FIG: 4. LIPID PROFILES IN BEZOAR AND NON- BEZOAR GOATS

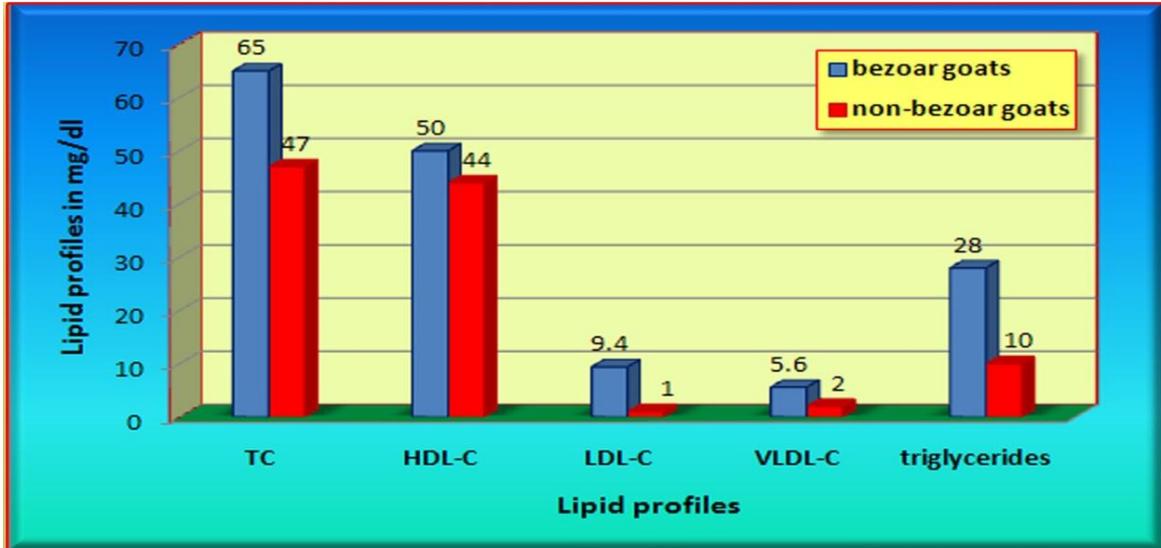


FIG: 5. LEVELS OF TOTAL PROTEINS, ALBUMIN AND GLOBULIN IN BEZOAR AND NON-BEZOAR GOATS

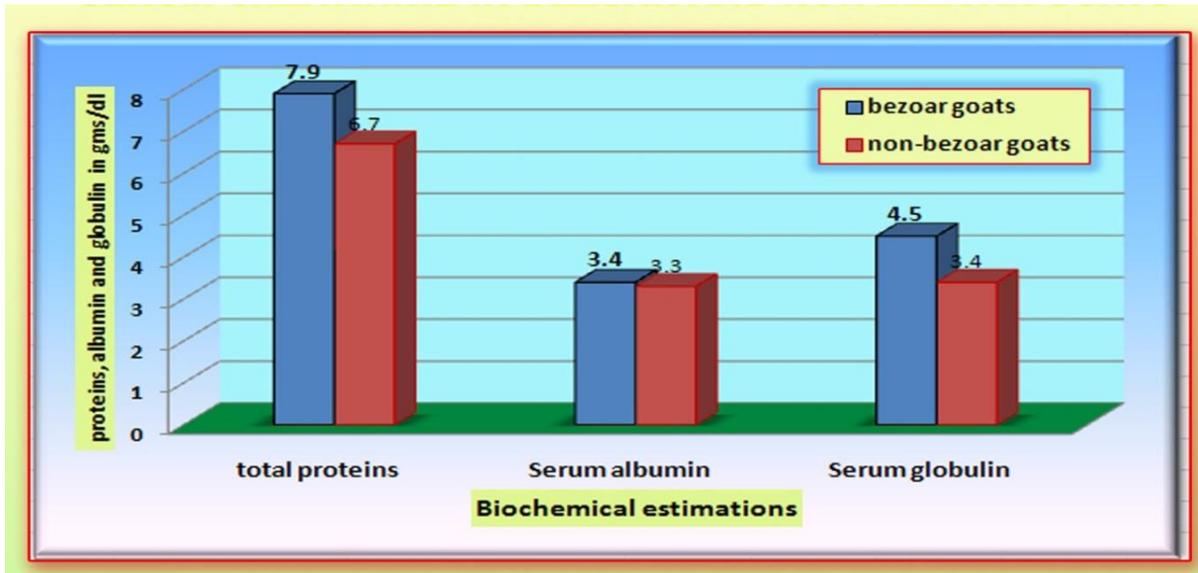


FIG: 6. BLOOD UREA LEVELS IN BEZOAR AND NON BEZOAR GOATS

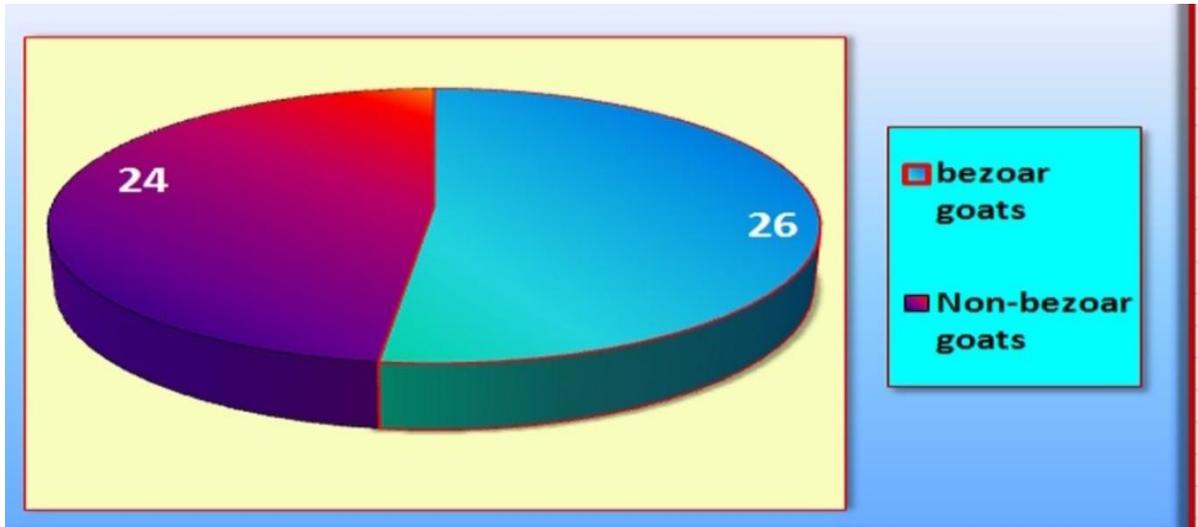


FIG: 7a. T.S OF THE LIVER OF NON BEZOAR GOAT

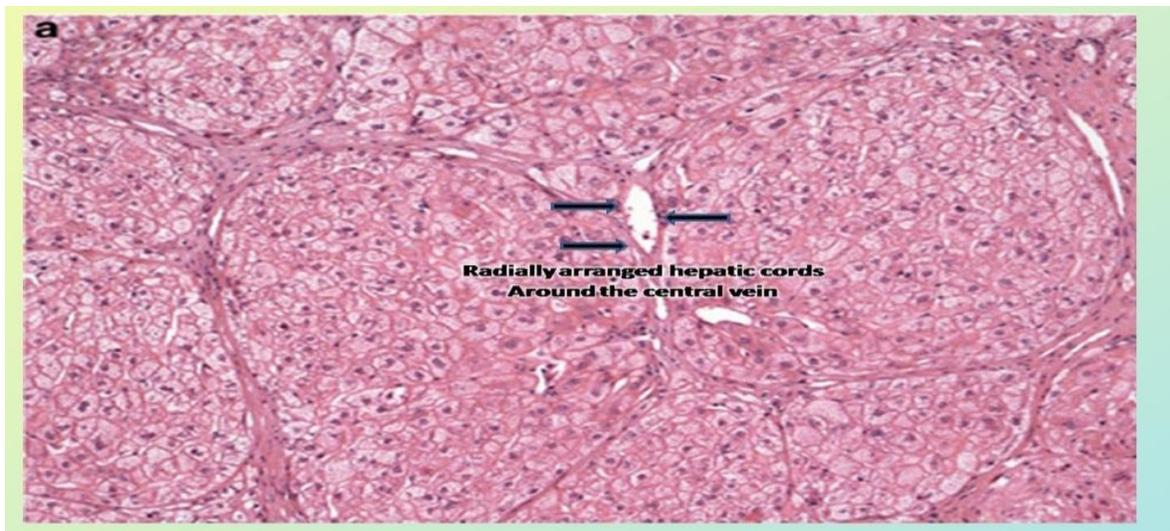


FIG: 7b. T.S OF THE LIVER OF BEZOAR GOAT

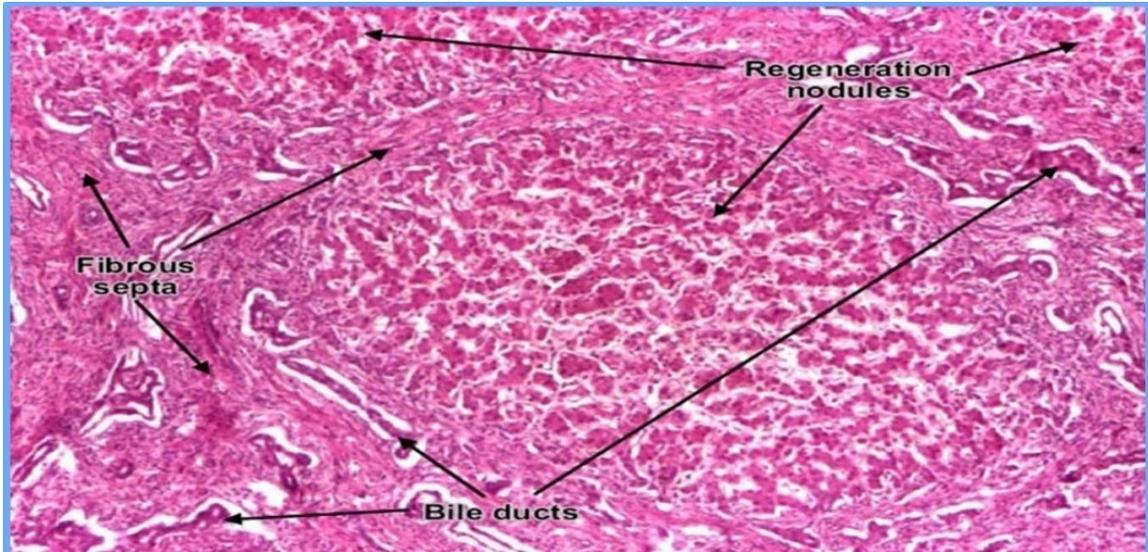


FIG: 8a. T.S OF THE KIDNEY OF NON- BEZOAR GOAT

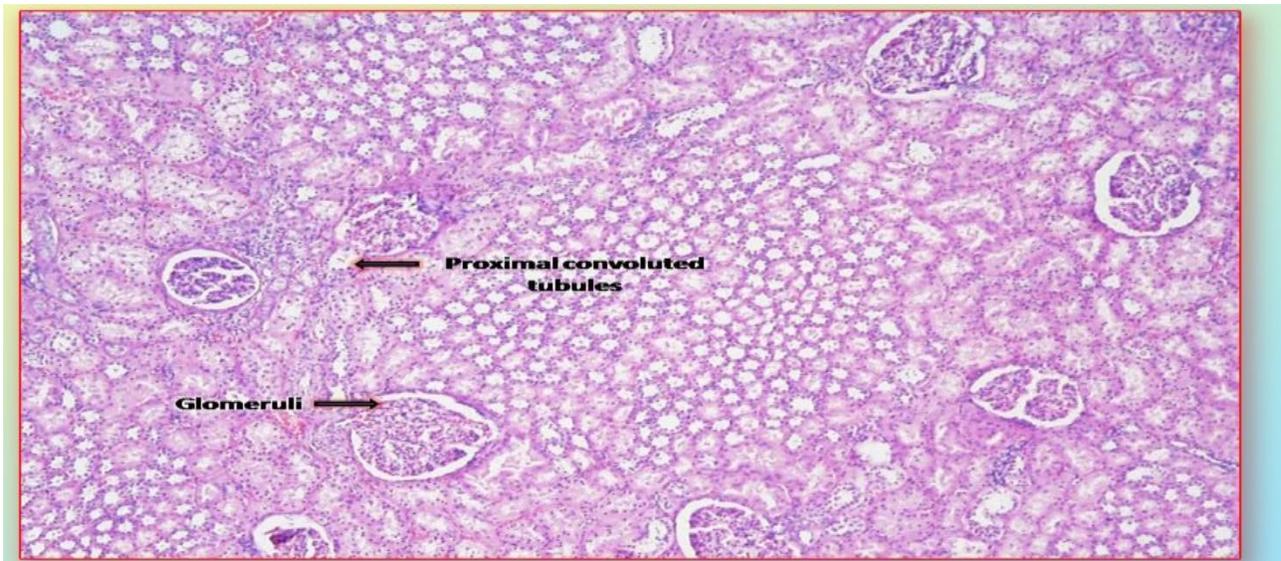


FIG: 8b. T.S OF THE KIDNEY OF BEZOAR GOAT

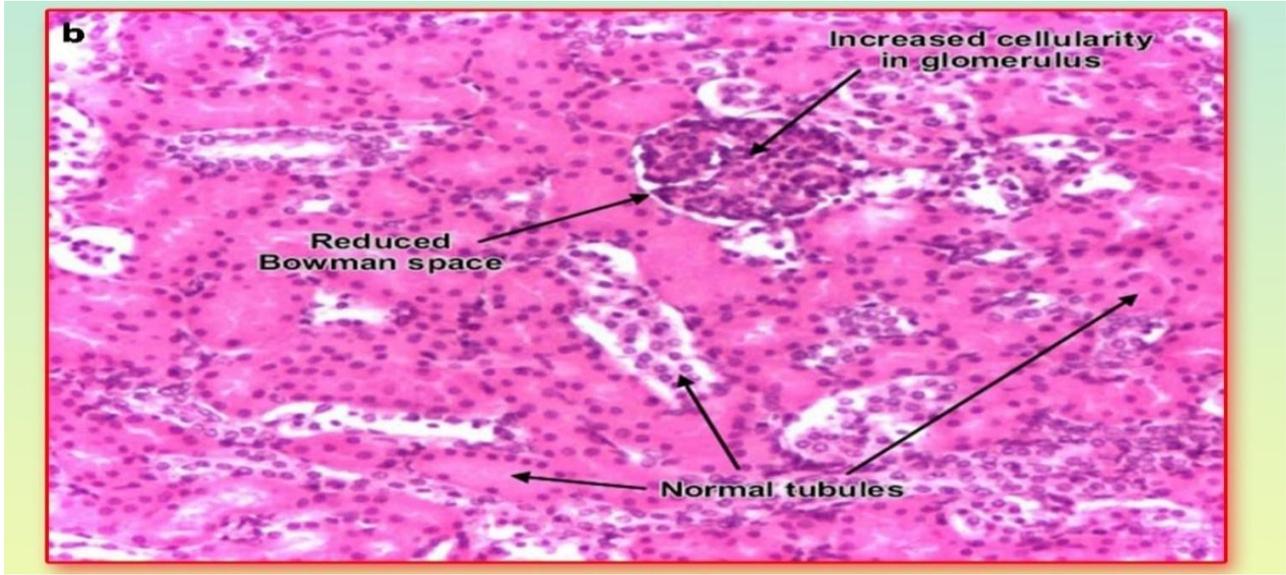


FIG: 9a. T.S OF THE STOMACH OF NON-BEZOAR GOAT

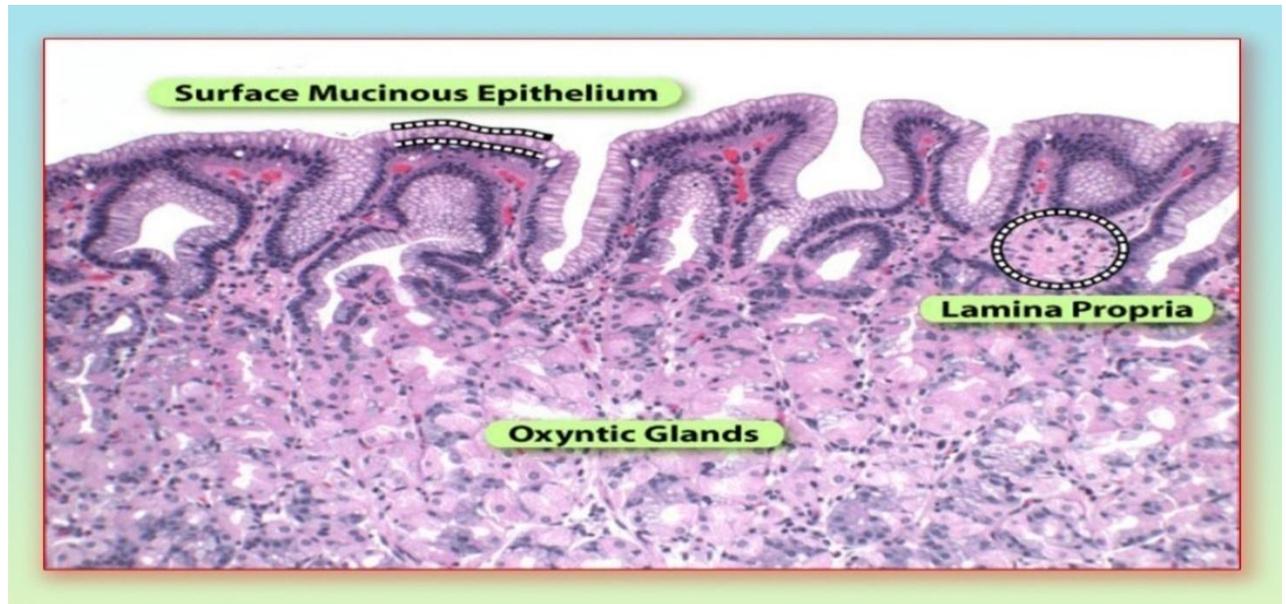
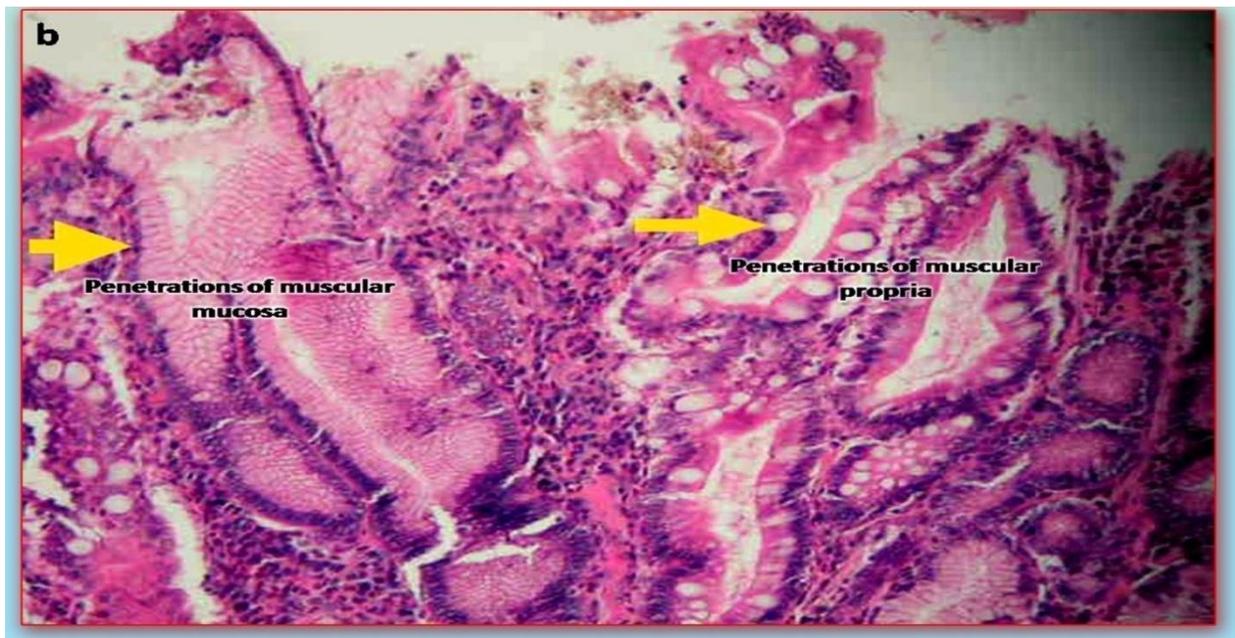


FIG: 9b. T.S OF THE STOMACH OF BEZOAR GOAT



IV. DISCUSSION

The present study shows the level of total cholesterol and other lipid profiles were not abnormal in bezoar non-bezoar goats. But, in bezoar goats when compared to non-bezoar goats, total cholesterol, triglycerides, HDL-C, VLDL-C and LDL-C were high. The increase of 47 ± 9 mg/dl to 65 ± 7 total cholesterol, 44 ± 5 to 50 ± 0 of HDL-C, 1 ± 0.4 to 9.4 ± 2.5 LDL - C and 10 ± 3.5 to 28 ± 6.2 mg/dl of triglycerides were found in non-bezoar and bezoar goats.

Total serum proteins levels were significantly increased in bezoar goats which suggest that the bezoar formation may be stimulated the catabolic activity of proteins. Albumin and globulin constitutes the major proteins in the serum and it has been felt appropriate to study the levels of albumin and globulin, which may help to understand the impact of bezoar formation on protein. In the present study the total protein in bezoar goats was 7.9 ± 1.0 gms/dl and in non-bezoar goats 6.7 ± 1.6 . 4.5 ± 1.0 gms/dl serum globulin was present in bezoar goats and 3.4 ± 1.2 gms/dl present in non-bezoar goats. The slight increased levels of these two types of proteins were resulted in the present study. Serum creatinine levels in bezoar goats (0.4 ± 0.1 mg/dl) decreased when compared to non bezoar goats (0.8 ± 0.1 mg/dl). The decrease in the total R.B.C. in bezoar goats indicate either its effect on the synthesis of R.B.C. or they might be worn out or lysed. Bezoar formation in goats causes severe damage to bone marrow (Stack et al 1995). Lee (1996) reported that bezoars formation cause skeletal defects such as osteoporosis in many mammalian species. They also reported that the effect of bezoars on calcium release and on the activity of some impairment enzymes for bone resorption and bone formation. Similarly the hemoglobin content was also significantly decreased in bezoar goats. The deficiencies of iron lead to

anemia resulting in the decreased hemoglobin content due to the effect of bezoar formation. The RBC count and hemoglobin content also depending on the feed/type of plant material taken by the goats. The platlet count was in bezoar goats was very high when compared to non-bezoar goats. This indicates the formation of bezoars influencing to increased blood clotting factor rate.

Neutrophils, eosinophils and lymphocytes were decreased in bezoar goats when compared to non bezoar goats. $41 \pm 6\%$ of lymphocytes were present in bezoar goats and $65 \pm 9\%$ were present in non-bezoar goats. This indicates reducing the immunity in bezoar goats. $29 \pm 4\%$ neutrophils and $4 \pm 1.5\%$ eosiniphils were found in bezoar goats and $55 \pm 8\%$ neutrophils and $6 \pm 3\%$ eosinophils were present in non-bezoar goats. Only monocytes and basophils percentage was increased in non-bezoar goats.

The hematological analysis indicates that the formation of bezoars caused significant influence on different blood parameters which in turn lead to functional and structural alterations at cellular level as evidence by the histopathological changes observed.

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