

Analysis of serum ascites albumin gradient (SAAG) in cats with hepatic disorder

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Abstract

Three Persian breed cats were diagnosed to be having hepatitis. Clinical examination revealed dullness, dehydration, poor body condition and fluid thrill on the abdominal palpation. Radiography and ultrasonography revealed ground glass appearance of the abdomen and anechoic fluid in the abdomen respectively. Elevated serum ascites albumin gradient with elevated serum alanine transaminase levels were noticed in these cats.

Keywords: Cat, ascites, hepatitis, SAAG

Abnormal accumulation of fluid in the peritoneal cavity is considered as ascites. Based on the total protein concentration of ascitic fluid, ascites is classified as transudate, modified transudate and exudate (Beg *et al.*, 2001). The difference between serum albumin and ascitic fluid albumin is more than 1.1 g/dL which is called high gradient ascites, whereas if the difference is less than 1.1 g/dL it is termed low gradient ascites (Burgess, 2004). Tarn and Lapworth (2010) considered the serum ascites albumin gradient as a marker of portal hypertension.

During the one-year period of study at Department of Veterinary Medicine, College of Veterinary Science, Proddatur, three Persian cats were diagnosed to be having ascites with hepatitis. All the cats were reported to be dewormed, vaccinated and fed with commercially available cat food. Clinical examination revealed dullness, fluid thrill on the abdominal palpation, elevated rectal temperature, increased heart rate, increased skin tenting test and poor body condition (Fig.1A). Abdominal radiography and ultrasonography revealed ground glass appearance of the abdomen and anechoic fluid in the abdomen respectively (Fig.1B, 1C). Ascitic fluid, peripheral blood smear and serum were collected for laboratory studies (Fig.1D). Serum total protein (6.22 g/dL; 5.97 g/dL and 6.12 g/dL), albumin (2.71 g/dL; 2.68 g/dL and 2.49 g/dL) and globulin (3.51 g/dL; 3.29 g/dL and 3.63 g/dL), ALT (232 IU/L; 308 IU/L and 392 IU/L) and ascitic fluid albumin (1.08 g/dL; 0.81 g/dL and 0.99 g/dL) were estimated in these cats.

The serum ascites albumin gradient was calculated by subtracting the ascitic fluid albumin

value from the serum albumin value. Serum ascites albumin gradients were 1.63; 1.87 and 1.50 in three cats respectively. Peripheral blood smears did not reveal any blood parasites. Nucleated cells, protein and specific gravity of ascites fluid in these cats were 2890 cell/microlitre, 1612 cells/ microlitre and 2090 cells/ microlitre, 2.8g/dL, 2.9g/dL and 2.62 g/dL & 1.015, 1.025 and 1.025 respectively. Based on the analysis it was considered as modified transudate and further confirms by serum ascites albumen gradient levels.

In cats, modified transudate considered as most common which might be due to congestive heart failure, neoplasia and hepatopathy. In the present study, heart failure was ruled out by electrocardiography and echocardiography, neoplasia was eliminated by the absence of abnormal tumour cells and further hepatopathy was confirmed by elevated serum liver enzymes. Feline infectious peritonitis is considered another common cause of ascites which is characterized by serum hyperproteinemia with high globulin and low albumin levels (Addie *et al.*, 2009) and it was ruled out by the presence of low total protein levels in the present study. In cats, hepatopathy might be due to lymphocytic cholangitis or due to portal hyper tension which increases the hydrostatic pressure. The present findings are in association with Saravanan *et al.* (2013) who documented transudate type of ascites and was depicted by a change in the SAAG levels along with albumin, total cell count, specific gravity and also total protein. Bhadesiya *et al.* (2015) utilized the SAAG for diagnosis of the dogs affected with ascites due to chronic hepatic disease.

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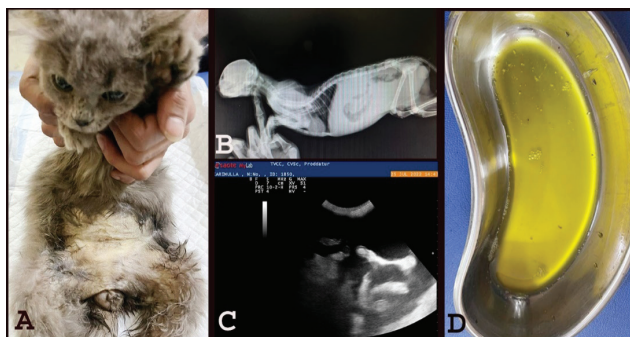


Fig.1A. Abdominal distension; 1B. Ground glass appearance of abdomen in radiography; 1C. Anechoic fluid in the abdomen in ultrasonography; 1D. Collected peritoneal fluid.

References

- Addie, D., Belak, S. and Baralon, B. 2009. Clinical review: feline infectious peritonitis. ABC guidelines of prevention and management. *J Feline Med Surg*, 11:594-604.
- Beg, M., Husain, S., Ahmad, N. and Akhtar, N. 2001. Serum/ascites albumin gradient in differential diagnosis of ascites. *J Indian Acad. Clin. Med*, 2: 51-54.
- Bhadesiya, C.M., Jani, R.G., Parikh, P.V., Pandey, A.M., Rao, N. and Shai, A. 2015. Hemato biochemistry and imaging study on ascites with hepatic and cardiac involvement in a German shepherd pup. *Int Res J Chem*, 11: 14-22.
- Burgess, L.J., 2004. Biochemical analysis of pleural, peritoneal and pericardial effusions- review. *Clinica Chimica Acta*, 343:61-84.
- Saravanan, M., Sharma, K., Kumar, M., Vijaykumar, H. and Mondal, D.B. 2013. Analysis of serum ascites albumin gradient test in ascitic dogs. *Vet World*, 5(5):285- 287
- Swetha, K., Reddy, B.S., Saritha G. 2023. Electrocardiographic studies in kitten and adult persian breed cats, *Veterinary Practitioner*, 24(2): 198-200.