

# CLINICO-DIAGNOSTIC STUDIES ON TRICUSPID VALVE DISEASE IN DOGS

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Twenty one dogs (15 male, 6 female) of age 5 to 14 years were presented to the small animal medicine ward of N.T.R, Gannavaram during the period of June 2014 to April 2015 with a history of lethargy, cough, inappetence, poor exercise tolerance, syncope, abdominal distention and pedal edema. Physical examination findings revealed tachycardia, systolic murmur, tachypnoea, gallop rhythm, ascites, weak femoral pulse and pale mucous membranes. Haematology revealed slightly fall in haemoglobin, PCV and neutrophilia. Serum biochemistry findings were increased levels of ALT, creatinine and CKMB. Thoracic radiography revealed right atrial enlargement, elevation of trachea and right ventricular enlargement. Electrocardiographic findings were right atrial enlargement, ventricular premature contractions, and S-T coving. Colour flow doppler echocardiography revealed tricuspid valve regurgitation and high velocity blood flow during systole and diastole.

**Keywords:** Diagnosis, Tricuspid valve disease, Dogs.

According to a study conducted on a population of 9248 dogs, cardiac diseases were the second most prevalent cause of death, according for a percentage of 16.3 (Eichelberg and Seine, 1996). Incidence of valvular diseases in dogs effected with a mitral valve alone is 62%, both mitral and tricuspid valves is 32.5% and tricuspid valves alone is 1.3% (Buchanan, 1977). Many dogs with tricuspid valve disease free of signs of heart disease. However heart disease caused by an abnormal tricuspid valve can be progressive and can eventually lead to heart failure for some dogs. All the chambers reach their capacity for enlargement, the pressure inside both chambers will begin to increase leading to right side heart failure. This article deals with clinical signs, hematology, and thoracic radiographic, electrocardiographic and echo-cardio graphic findings of tricuspid valve disease in 21dogs.

## Materials and Methods

The study was conducted in twenty one dogs (15 male, 6 female) of age 5 to 14 years presented in small animal medicine ward of NTR College of Veterinary Science, Gannavaram, with the complaint of lethargy, cough, inappetence, poor exercise tolerance, Syncope, abdominal distention and pedal edema. Physical examination findings in general noticed by the dogs were

tachycardia, systolic murmur, tachypnoea, gallop rhythm, ascites, weak femoral pulse and pale mucous membranes. All these dogs suspected of cardiovascular involvement were subjected to further diagnostic tests viz., radiography, electrocardiography and echocardiography. Thoracic radiography was done in lateral and dorsoventral views. ECG was done in all the twenty one dogs in right lateral recumbence using standard bipolar limb lead II which is the most commonly used lead for diagnosing different cardiac abnormalities in dogs. Echocardiography was performed 2D, M-mode and Doppler mode. All the cases were diagnosed as Tricuspid valvular disease based on signalment, patient history, results of physical examination, electrocardiography, thoracic radiography and echocardiography. Ten apparently healthy dogs brought for routine general checkup and vaccination were selected as control groups for obtaining normal data for comparison of parameters under study.

## Results and Discussion

The most prominent clinical signs observed in dogs with tricuspid valve disease were Lethargy (100 percent), poor exercise tolerance, respiratory distress and abdominal distention (50 per cent) and inappetence (100 per cent) (Fig.1). Syncope in dogs with tricuspid valve disease may be due to

significant arrhythmias and decreased cardiac output. The prominent physical examination findings in dogs with tricuspid valve disease were systolic murmur (71.42 per cent), ascites (57.14 per cent), tachycardia (57.14 per cent), tachypnoea (42.85 per cent), weak femoral pulse (42.85 per cent) and pale mucous membranes (28.57). Ascites, tachypnoea, tachycardia and weak femoral pulse recorded in dogs with tricuspid valve disease were associated with right sided heart failure irrespective of etiology of heart disease. Haematology revealed slightly fall in haemoglobin ( $9.8 \pm 0.45$  g/dl), PCV ( $28.67 \pm 1.99$  per cent) and neutrophilia ( $12,554.33 \pm 786.25$ ) when compared to control dogs (Hb  $12.27 \pm 0.45$  g/dl, PCV  $36.30 \pm 1.28$  per cent, neutrophil count  $7819.4 \pm 294.75$ ). This might be due to inappetance and anorexia, neutrophilic leukocytosis which might be attributed to inflammatory reaction possibly associated with increased levels of TNF and IL1 as also reported by Singh *et al.*, 2014. Serum biochemistry findings were increased levels of ALT ( $55.17 \pm 7.16$  IU/dl) when compared with control group ( $33.74 \pm 1.3$  IU/dl). Creatinine ( $1.18 \pm 0.08$  mg/dl) and CKMB ( $26.40 \pm 0.57$  u/l) when compared with control group ( $0.84 \pm 0.38$  mg/dl and  $19.82 \pm 0.62$  u/l respectively) this might be due to organ congestion due to low cardiac output in dogs with CHF. The thoracic radiographic findings in dogs with tricuspid valve disease were

right atrial enlargement in 57.14 per cent (4/7), elevation of trachea in 57.14 per cent (4/7), right atrial and right ventricular enlargement in 28.57 per cent (2/7). Increased sternal contact recorded in case of tricuspid valve disease is suggestive of right ventricular enlargement, (Fig. 2). ECG findings in dogs with tricuspid valve disease were right atrial enlargement 57.14 per cent (4/7), atrial fibrillation 42.85 per cent (3/7), normal sinus rhythm 28.57 per cent (2/7), and ventricular premature contractions 14.28 per cent (1/7). Significant elevation in EDV and ESV was observed in dogs with tricuspid valve disease. Whereas the elevation in values of LVIDd, LVIDs, EPSS, LA/AO and significant decrease in values LVPWd, LVPWs, IVSd, IVSs, FS and EF observed was statistically non significant (Fig. 3). Pulse wave Doppler (5/7), continuous wave Doppler (5/7) and colour flow Doppler echocardiographic findings (7/7) in dogs with tricuspid valve disease were tricuspid valve regurgitation and high velocity blood flow during systole and diastole. The present findings were in agreement with reports of Mutalk *et al.* (2007). The regurgitant jet of colour-coded patterns originated at the center of coaptation of the mitral and tricuspid valve. The tricuspid valve regurgitation jet signal was defined near the mitral and tricuspid orifice during the systolic phase as also mentioned by Muzzi *et al.*, 2003, (Fig. 4).

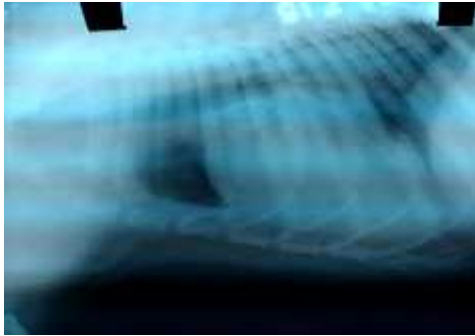
**Fig.1 Clinical Signs in Dogs with Tricuspid Valve Disease**



**Lethagy**



**Ascites**



**Fig. 2. Thoracic radiographic finding Dogs with Tricuspid Valve Disease**



**Fig. 3. Tricuspid valve disease with right ventricular enlargement-2D echocardiography**



**Fig. 4. Colour flow Doppler echocardiography-Tricuspid valve regurgitation**

**Table-1 Mean  $\pm$  SE Echocardiographic values in control and Tricuspid valve heart disease**

Parameter	Control	Tricuspid valve disease
LVIDd(cm)	4.24 $\pm$ 0.16	4.42 <sup>NS</sup> $\pm$ 0.11
LVIDs(cm)	2.8 $\pm$ 0.03	2.96 <sup>NS</sup> $\pm$ 0.06
LVPWd(cm)	0.84 $\pm$ 0.04	0.78 <sup>NS</sup> $\pm$ 0.06
LVPWs(cm)	1.29 $\pm$ 0.06	1.22 <sup>NS</sup> $\pm$ 0.05
IVSd(cm)	0.89 $\pm$ 0.04	0.82 <sup>NS</sup> $\pm$ 0.07
IVSs(cm)	1.29 $\pm$ 0.04	1.24 <sup>NS</sup> $\pm$ 0.07
LA/AO	0.89 $\pm$ 0.01	0.95 <sup>NS</sup> $\pm$ 0.06
EPSS(cm)	0.41 $\pm$ 0.02	1.01 <sup>NS</sup> $\pm$ 0.01
FS(%)	34.84 $\pm$ 0.74	30.88 <sup>NS</sup> $\pm$ 0.69
EF(%)	68.66 $\pm$ 1.07	62.22 <sup>NS</sup> $\pm$ 1.55
EDV(ml)	70.66 $\pm$ 2.67	90.66 * $\pm$ 4.09
ESV(ml)	25.26 $\pm$ 1.67	55.67 * $\pm$ 1.68

\* -Statistically significant(p 0.05)

NS - Statistically not significant

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