

STUDIES ON OSCILLOMETRIC BLOOD PRESSURE VARIATIONS ASSOCIATED WITH MANAGEMENT OF MITRAL VALVE INSUFFICIENCY IN DOGS

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Introduction

Changes in blood pressure have been reported associated with a variety of conditions in small animal practice. Hypertension can be broadly divided into stress induced, secondary and idiopathic (Brown *et al.* 2007). Monitoring of hypertension has also gained importance with regard to the target organ damage it can cause. Most common changes reported in dogs with hypertension include abnormal valvular motion and left ventricular hypertrophy (Carr and Egner, 2009). The present study reports on the variations in systolic and diastolic blood pressure associated with management of mitral insufficiency in dogs with enalapril and torsemide therapy.

Materials and Methods

The study consisted of nine dogs with clinical findings and echocardiographical evidence of mitral insufficiency. Echocardiographic study was performed using a Mindray Z6 ultrasound machine. Standard right parasternal, short axis and left apical four chamber views and colour Doppler analysis was carried out for diagnosing mitral insufficiency. Mild to moderate mitral regurgitation was recorded in nine cases. Non-invasive blood pressure monitoring was carried out using BP-Accugard oscillometrics small animal digital

blood pressure apparatus. With the animal in lateral recumbency, recordings were made in a calm environment using cuffs of suitable sizes. The cuffs were fixed on the forelimb at the same level with the base of the heart.

The first reading was discarded and the next three successive readings were taken and the average values were recorded (Carr *et al.* 2008). Systolic and diastolic blood pressures were recorded before the start of the study and after three months at the end of the study. The dogs were treated with enalapril @0.5 mg/kg per os twice daily and torsemide @ 0.2 mg/kg once daily orally for a period of three months. The systolic and diastolic blood pressures recorded before and at the end of the study were compared with a control group of apparently normal animals. Within the treatment group, analysis was carried out for comparing the systolic and diastolic values before and at the end of the study. Statistical analyses was carried out with ANOVA for comparison between groups and paired 't' test for analysis within groups using SPSS software package.

Results and Discussion

The variation in blood pressure between the treatment group and control group before and after treatment is as presented in table 1. The mean of the systolic blood pressure in the treatment

Table 1. Systolic and diastolic blood pressure variation between the treatment group and the control group and within the treatment group before and after treatment

	Treatment Group		Control Group (Mean \pm S.E)
	Before treatment (Mean \pm S.E)	After treatment (Mean \pm S.E)	

Systolic Blood Pressure (mm Hg)	145.07±2.14 ^{aA}	134.55 ±2.61 ^{bB}	130.20±1.78 ^b
Diastolic Blood Pressure (mm Hg)	103.33±1.92 ^{aA}	91.84±1.59 ^{aB}	85.63±1.86 ^b

Mean ± S.E bearing different superscripts of the lower case differ significantly between control group and treatment group. Mean ± S.E bearing different superscripts of the upper case differ significantly within the treatment group.

group was found to be significantly high (5% level) before treatment in comparison to the control group. A similar variation existed for the diastolic values also with diastolic values of 103.33±1.92 mm Hg and 85.63±1.86 mm Hg for treatment group and control group respectively. After treatment there was a considerable reduction in systolic blood pressure with no significant difference between treatment and control groups at the end of the study. However, though the diastolic blood pressure after treatment declined, it was significantly higher than the control values. Within the treatment group, there was a significant reduction in systolic and diastolic values after treatment in comparison to the pre-treatment values. Similar results of systolic blood pressure were reported by Ljungvall *et al.* (2011) and Petit *et al.* (2013). As per the American College of Veterinary Internal Medicine consensus statement, a systolic / diastolic value more than 150/95 puts the animal at risk of target organ damage. The pre-treatment systolic value is within the reference range and the diastolic value is above the reference range. Angiotensin inhibitors like enalapril are recommended as initial agents of choice in the management of hypertension in dogs (Brown *et al.* 2007). In conclusion, the present study revealed that a satisfactory reduction in systolic blood pressure which could be achieved thus preventing possible target organ damage and in turn deleterious effects have been compromised in cardiac activity.

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