Efficacy of Different Drugs in the Management of Congestive Heart Failure Related to Dilated Cardiomyopathy in Dogs

K. Usha Sree, V. Vaikunta Rao, K. Nalini Kumari and D. Rani Prameela
Department of Teaching Veterinary Clinical Complex, College of Veterinary Science, Tirupati, Andhra Pradesh – 517502.

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Abstract
Dogs with dilated cardiomyopathy (DCM) were randomly allotted to two treatment groups. Dogs in group-I are treated with Digoxin-0.22 mg/m² twice daily, Enalapril-0.5 mg/kg b.wt daily, Furosemide-2mg/kg b.wt twice daily orally. Dogs in group-II were treated orally with L-Carnitine-50 mg/kg b.wt and Tab Abana 250 mg/dog twice daily. Therapeutic efficacy of drugs was made on the basis of comparative assessment of m-mode left ventricular contractility indices between dogs of group-I and group-II on zero and forty five days post treatment. The post treatment values of fractional shortening (FS) and Ejection fraction (EF) among Group-I and group-II were statistically not significant. In group-I after forty five days of treatment there was incidence of azotemia, whereas in group-II there was no incidence of azotemia that might be due to added cardioprotective effect of L-Carnitine and Abana.

Key words: Cardiomyopathy, heart failure, Abana, Dogs.

Idiopathic DCM in dogs is congestive heart failure(CHF) in conjunction with dilatation of the cardiac chambers and absence of other clinically important cardiovascular disease (Ettinger and Surter, 1970). Abana(Terminalia arjuna, Withania somnifera, Nepeta hindostana,
Dashamoola, Tinospora cordifolia, Emblica officinalis, Terminalia chebula, Eclipta alba syn Eclipta prostrate, Glycyrrhiza glabra, Asparagus racemosus) is a herbal product from the Himalayan health care which is known as an alternative cardioprotective drug in the management of congestive heart failure (CHF) in human beings. In the present investigation, an attempt has been made to compare the efficacy of Abana in the management of CHF related to DCM in dogs.

Materials and Methods

The study conducted on sixteen clinical cases brought to the Teaching Veterinary Clinical Complex, Tirupati. Dogs with clinical signs of cardiac insufficiency were screened by using a specially designed cardiology data sheet and subjecting to detailed general clinical examination, physical examination, haematology, serum biochemistry, thoracic radiography and electrocardiography. Dogs that were suspected for cardiomyopathy were subjected to M-mode echocardiographic evaluation to confirm the diagnosis and quantify the left ventricular dysfunction.

Results and Discussion

The pre treatment values of left ventricular M-mode echocardiographic findings in all two groups were subjected to completely randomized design analysis. There was no significant difference in pre treatment values of dogs among the two groups. Hence, pre treatment values of twelve, six values from each parameter were taken randomly and used as a pre treatment group. Therapeutic efficacy of the drugs were made on the basis of comparative assessment left ventricular fractional shortening and ejection fraction (contractility indices) were used to demonstrate the therapeutic efficacy of different treatment groups.

Table I. M-mode Left ventricular contractility indices in control and DCM dogs (mean±SE)

<table>
<thead>
<tr>
<th>Name of the parameter</th>
<th>Control</th>
<th>DCM dogs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fractional shortening (in per cent)</td>
<td>35.26±1.05</td>
<td>18.2±0.17**</td>
</tr>
<tr>
<td>Ejection fraction (in per cent)</td>
<td>55.56±1.80</td>
<td>38.20±0.86**</td>
</tr>
</tbody>
</table>

*significant (p≤0.05), ** highly significant (p≤0.01), NS – not significant (p>0.05).

Dogs in group-I are treated with Digoxin-0.22mg/m² twice daily, Enalapril-0.5 mg/kg b.wt daily, Furosemide-2 mg/kg b.wt twice daily orally were given. Dogs in group-II were treated orally with L-Carnitine-50mg/kg b.wt and Tab Abana-250 mg/dog twice daily.

Therapeutic efficacy of the drugs was made on the basis of comparative assessment of M-mode left ventricular contractility indices between dogs of group I and II on zero and forty five days post treatment. Changes in post treatment values of M-mode left ventricular fractional shortening and ejection fraction (contractility indices) were used to demonstrate the therapeutic efficacy of different treatment groups.

Table II. Mean ± S.E of M-mode Left ventricular contractility indices in treatment groups (in percent)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Treatment group</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fractional shortening</td>
<td>I</td>
<td>17.78 ± 0.20</td>
<td>27.32 ± 0.35**</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>26.82 ± 0.89</td>
<td></td>
</tr>
<tr>
<td>Ejection fraction</td>
<td>I</td>
<td>36.02 ± 0.31a</td>
<td>54.50 ± 0.83b</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>52.00 ± 0.79b</td>
<td></td>
</tr>
</tbody>
</table>

Values with different superscripts have different significance.

The mean, SE and significance of left ventricular contractility indices of pre treatment and post treatment in two groups are
given in the following table. Highly significant (P<0.01) elevation of FS and EF was observed in all two treatment groups when compared to pre treatment values. These findings concur with earlier workers (Strickland and Goodwin, 1998, Sisson and Kittleson, 1999, Mc Ewan, 2000, Jordan 2003 and Rao et al., 2008.) The post treatment values of Fractional shortening (FS) and Ejection fraction (EF) observed among groups-I and group-II were not statistically significant. The elevation in contractility indices could be attributed to positive ionotropic effect of digoxine in treatment group-I and myocardial strengthening with L-carnitine supplementation and cardioprotective effect of Abana in group-II. (Ettinger et al., 1998, Sisson and Kittleson loc. cit, Yegnarayan et al., 1997, Raghavendra rao, 1998,Wasalwar,1985).The Terminalia arjuna, Boerhavia diffusa as active ingredients possess diuretic effect of abana in treatment group- II. The present findings are in agreement with Raghavendar Rao loc. cit and Wasalwar loc. cit who observed the cardioprotective effects of abana in human beings with idiopathic DCM. In the present study two dogs in group- I were azotemic after forty five days of treatment. Whereas in treatment group- II there was no incidence of azotemia, this might be due to the added cardioprotective effect of L-carnitine and abana.

Summary
Combination of L-Carnitine and Abana was found to be effective in the treatment of CHF associated with dilated cardiomyopathy.

References
Wasalwar, G.V. (1985) Abana-a cardiac tonic Probe xxv:1,76.