



Short Communication

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Variation in the management of congestive cardiac failure in dogs

T. Davies, S. Everitt, M. Cobb

ALTHOUGH the underlying cause of acquired cardiac disease in dogs can be identified or assumed in most cases, it cannot often be corrected, thus the approach to managing congestive cardiac failure (CCF) is to treat the consequences of the disease using a combination of drugs and other non-drug management options (Keene and Bonagura 2009). Veterinary surgeons presented with a canine patient suffering from CCF have an increasingly wide range of therapeutic options available to choose from and use of many of these therapeutic agents is supported by reliable published evidence, and recently guidelines on the management of CCF due to canine degenerative valve disease in particular have been published (Atkins and others 2009). Comparatively less evidence is available to support the use of non-drug management options that veterinary surgeons often recommend for the canine CCF patient, including changes to an animal's exercise regime, weight control and dietary changes or supplementation (Keene and Bonagura 2009). Given the multiple therapeutic options for the management of CCF in the dog and the evidence available to support their use, the purpose of this study was to investigate the decisions made with reference to the management of CCF caused by both canine degenerative valve disease (CDVD) and dilated cardiomyopathy (DCM) in the dog in the UK.

Prior to the study, ethical approval was obtained from the university. A total of 604 questionnaires were sent to 301 veterinary practice addresses across the UK obtained from a database held by the school. Each questionnaire was accompanied by a letter explaining the research, and return of the questionnaires was incentivised.

The questionnaire was written in the style of clinical vignettes, two short clinical cases describing dogs with CCF, one on each page; the first case was based on a dog with CDVD, the second a dog with DCM. The clinical cases are included as supplementary material. The following four identical questions were asked about the management of each case:

1. Which drugs, if any, would you prescribe for this case?
2. Would you make any other recommendations regarding management of the case?

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TABLE 1: Responses to the question: which drugs, if any, would you prescribe for case 1?

Drug combinations	Total number of responses (% of vets)
Furosemide, pimobendan and benazepril	16 (28.6)
Furosemide and pimobendan	14 (25.0)
Furosemide and benazepril	12 (21.4)
Furosemide, pimobendan, benazepril and spironolactone	4 (7.1)
Furosemide, pimobendan and spironolactone	2 (3.6)
Pimobendan only	2 (3.6)
Benazepril only	2 (3.6)
Furosemide, benazepril and spironolactone	2 (3.6)
Pimobendan and spironolactone	1 (1.8)
Furosemide only	1 (1.8)

3. Would you carry out any further investigations to diagnose or treat this case?
4. When would you want to see this case again?

In total, 65 of 604 questionnaires were returned (11 per cent), of which 9 questionnaires could not be analysed; 56 questionnaires were therefore analysed. The different combinations and the frequency with which drugs would have been prescribed for the two cases are shown in Tables 1 and 2. Additional recommendations and further investigations suggested for the two cases are recorded in Tables 3 and 4.

In total, 37 vets (66 per cent) would see case 1 within seven days, 34 vets (61 per cent) would see case 2 within seven days and six vets said they would hospitalise case 2 at presentation.

The use of clinical cases written in the style of vignettes has previously been shown to be an effective way to investigate physician practice (Peabody and others 2004). The questions asked were developed so that they were quick to answer, while being broad enough for information-gathering purposes. The final response rate (11 per cent) was low compared with previous studies in this field (Pelzer and Leysen 1991, Wales 2000); nevertheless, it is interesting that there is significant variation in the reported management of identical cases even in this relatively small sample, particularly in the management of case 2 (DCM).

The guidelines for CDVD (Atkins and others 2009) include recommendations regarding pharmacological and dietary therapy for patients with heart failure of different degrees of severity. For the case described in the vignette, furosemide, angiotensin-converting enzyme inhibitor and pimobendan therapy would have been recommended, along with a home-based programme, to optimise body weight and appetite and monitor heart and respiratory rates. While the majority of vets

TABLE 2: Responses to the question: which drugs, if any, would you prescribe for the management of case 2?

Drug combinations	Total number of responses (% of vets)
Furosemide, pimobendan and digoxin	9 (16.1)
Furosemide, pimobendan and benazepril	9 (16.1)
Furosemide, pimobendan, benazepril and digoxin	6 (10.7)
Furosemide, pimobendan, benazepril and spironolactone	5 (8.9)
Furosemide and pimobendan	4 (7.1)
Furosemide and digoxin/digitalis	2 (3.6)
Furosemide, benazepril and diltiazem	2 (3.6)
Furosemide, pimobendan, benazepril, digoxin and spironolactone	1 (1.8)
Others	18 (32.1)

TABLE 3: Responses to the question: would you make any other recommendations regarding management of cases 1 and 2?

Nature of recommendation(s)	Total number of recommendations (% of vets)	
	Case 1	Case 2
Exercise regime changes	39 (69.6)	26 (46.4)
Weight monitoring/loss	16 (28.6)	8 (14.3)
Dietary modification—reduce salt intake	14 (25.0)	5 (8.9)
Dietary modification—mention of cardiac diet	8 (14.3)	0
Recommend future checkups/ reassessment/ ±addition of further drugs or change in dosages in future	8 (14.3)	11 (19.6)
Monitor MM, RR, HR	5 (8.9)	1 (1.8)
Dietary modification—other	4 (7.1)	4 (7.1)
Complete restriction of exercise	0	5 (8.9)
Hospitalisation with tests or treatments	0	4 (7.1)
Advise poor prognosis/sudden death risk	0	8 (14.3)

HR, heart rate; MM, mucous membrane; RR, respiratory rate

did make recommendations regarding the management of the cases, the most common was advising a change in the animal's exercise regime, which is not something covered in the guidelines for CDVD, and some respondents recommended complete exercise restriction for case 2. The second most common recommendation was recommending the monitoring of, or encouraging loss of, the animal's weight, which is interesting since there was no mention made of weight management in the vignette and suggests that the respondents have gone beyond the vignette, supplementing the scenario with their own clinical experience. Only a small proportion of the respondents made any dietary recommendation.

The guidelines for CDVD (Atkins and others 2009) also make recommendations regarding diagnostic testing, which may be appropriate for cases with different degrees of congestive cardiac failure. For the case described in the vignette, radiography and ideally echocardiography and a serum biochemical profile would probably be recommended. In this study, less than half the respondents would carry out any additional diagnostic tests despite being told in the vignette that money was not a limiting factor.

The variation in management could be a consequence of a number of factors, including the age and experience of the respondents and their confidence in their ability to manage the cases based on a clinical diagnosis. Similarly, the nature of the practice in which the respondent worked might influence approach and therapy. The enthusiasm of the respondent for cardiology and attendance at appropriate CPD might also influence the clinician's approach to the cases.

In conclusion, this study has demonstrated that profound variation exists in the management of heart failure in general

TABLE 4: Responses to the question: Would you carry out any further investigations to diagnose or treat cases 1 and 2?

Nature of recommendation(s)	Number of responses (% of vets)	
	Case 1	Case 2
Blood sampling of any sort	15 (26.8%)	19 (33.9%)
Mention of ECG	14 (25.0%)	9 (16.1%)
Mention of ultrasonography	25 (44.6%)	4 (7.1%)
Blood pressure assessment	4 (7.1%)	3 (5.4%)
Mention of taking a radiograph	1 (1.8%)	1 (1.8%)
Regular monitoring—weekly auscultation	0	1 (1.8%)
Urinalysis	2 (3.6%)	1 (1.8%)
Monitor heart rate	0	1 (1.8%)
Referral after stabilisation/referral for cases of dilated cardiomyopathy/would probably refer	NA	3 (5.4%)

veterinary practice in the UK despite considerable reliable published evidence supporting the use of many of the agents, and recently guidelines on the management of CCF due to canine degenerative valve disease (Atkins and others 2009); goals of future research should be to investigate why this is the case and importantly what the impact of this variation in approach might have on patient survival.

Correction notice This article has been corrected since it was published Online First. A citation to the supplementary material has been added to the text.

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