Degenerative mitral valve disease in dogs attending UK practices

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Background

Degenerative mitral valve disease (DMVD) is the most common cardiac disease in dogs (1), yet optimum management of affected animals remains a challenge. Analysis of large-scale primary-care data would improve understanding of DMVD.

Aims

- **Document the prevalence of and identify risk factors for DMVD**
- Evaluate the survival characteristics of affected dogs
- Determine the prognostic value of clinical measurements and cardiac biomarkers in the primary-care setting

M&M

Study design for retrospective study (prevalence and risk factor study)

- Nested case control study

Data collection

- Electronic patient records (EPRs) of dogs attending primary-care veterinary practices in the UK were shared with the Veterinary Companion Animal Surveillance System (VetCompass) (2) between January 01 2010 and December 31 2011.

Study population

- Cases were defined as dogs with a veterinary diagnosis of DMVD (or synonym) recorded in their EPRs.
- Possible cases were dogs >1 year old with a documented heart murmur not inconsistent with a diagnosis of DMVD.
- Controls were randomly selected from the population of non-cases >1 year old (www.random.org).

Data analysis

- Prevalence and descriptive statistics were calculated for the study population.
- Mixed effect logistic regression models identified variables associated with a diagnosis of DMVD.
- All analysis used Stata 13 (Stata Corp. Texas US).

Results

Prevalence estimate

- **Denominator:**
  - 111,967 dogs attending 93 clinics
- **Veterinary-diagnosed DMVD cases**: 405 dogs
- **Possible DMVD cases**: 3557 dogs
- **Apparent prevalence**
  - Veterinary-diagnosed DMVD: 0.36% (95%CI: 0.33 – 0.40%)
  - Veterinary-diagnosed and possible cases: 3.54% (95% CI: 3.43 – 3.65%)

Descriptive statistics Veterinary-diagnosed DMVD cases

- **Age disease first recorded:** Mean: 9.52 years (standard deviation: 3.20)
- **Maximum recorded bodyweight** Median: 11.3kg (IQR 8.4 - 16.3kg)
- **Sex:** 252 (62.2%) males
- **Insurance status:** 274 (69.0%) insured
- **Deaths during follow-up:** 212 (52.3%) died
- **Cardiac deaths:** 84 (39.6% of deaths)

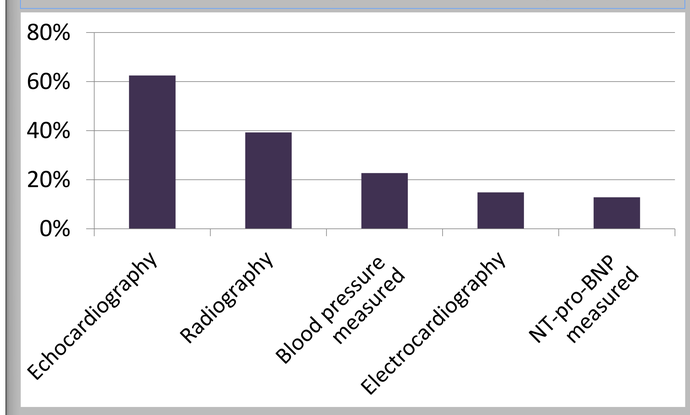

Figure 1. Percentage of 405 dogs with veterinary-diagnosed DMVD undergoing diagnostic procedures

Risk factor study

Age, sex, body weight, insurance status and breed were strongly associated with a veterinary diagnosis of DMVD in univariable and multivariable logistic regression analysis (Table 1).

Table 1. Multivariable logistic regression model for factors associated with a veterinary diagnosis of degenerative mitral valve disease in dogs attending 93 primary-care veterinary practices in the UK. Veterinary clinic was included as a random effect due to clustering (P<0.001). Observations for 4,363 dogs.

Variable	Odds ratio	95% CI*	P-value
Age group (years)			<0.0001
<4.0	Baseline	-	
4.0 - <7.0	**7.02**	**3.28 – 15.04**	
7.0 - < 10	**33.40**	**16.05 – 69.49**	
10.0 - <13.0	**97.66**	**46.65 – 204.45**	
13.0 +	**146.36**	**67.70 – 316.42**	
Sex			0.025
Female	Baseline	-	
Male	**1.40**	**1.04 – 1.88**	
Maximum body weight (kg)			<0.0001
<10.0	Baseline	-	
10.0 - <20.0	0.82	0.54 – 1.23	
20.0 - <30.0	**0.56**	**0.33 – 0.97**	
30.0 +	**0.26**	**0.13 – 0.52**	
No weight recorded	**0.22**	**0.10 – 0.43**	
Insured status			<0.0001
Not insured	Baseline	-	
Insured	**3.87**	**2.81 – 5.32**	
Not specified	**0.40**	**0.17 – 0.93**	
Breed			<0.0001
Cavalier King Charles Spaniel	**47.05**	**25.82 - 85.74**	
King Charles Spaniel	**30.65**	**11.03 – 85.21**	
Chihuahua	**5.11**	**1.79 – 14.65**	
Poodle	2.73	0.98 – 7.65	
Yorkshire Terrier	2.04	0.98 – 4.26	
Border Collie	1.83	0.12 – 2.19	
Miniature Schnauzer	1.79	0.55 – 5.80	
Dachshund	1.59	0.46 – 5.57	
Shih Tzu	1.45	0.58 – 3.67	
Jack Russell Terrier	1.28	0.66 – 2.48	
Golden Retriever	1.11	0.32 – 3.82	
Greyhound	1.09	0.21 – 5.59	
Purebred Other	1.08	0.65 – 1.80	
Crossbred	Baseline		
Cocker Spaniel	0.89	0.40 – 1.95	
Boxer	0.77	0.16 – 3.76	
Lurcher	0.69	0.13 – 3.73	
Border terrier	0.63	0.15 – 2.64	
Labrador retriever	0.55	0.22 – 1.38	
Bichon Frise	0.51	0.12 – 2.19	
Cairn Terrier	0.49	0.09 – 2.68	
Lhasa Apso	0.43	0.12 – 1.63	
West Highland White Terrier	**0.40**	**0.17 - 0.90**	
Staffordshire Bull Terrier	0.37	0.13 – 1.04	
German Shepherd	0.23	0.03 – 1.87	
English Springer Spaniel	**0.10**	**0.01 – 0.87**	

*95% Confidence intervals
Statistically significant categories (P<0.05) are shown in **bold.**

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References
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2. VetCompass. *VetCompass: Health surveillance for UK companion animals. http://www.rvc.ac.uk/VetCompass 2014 [cited 2014 March 02]*

Conclusions

DMVD typically affected geriatric small to medium sized dogs in this population of dogs attending primary-care practices. Approximately 40% of deaths were documented to have been primarily as a result of cardiac disease. A prospective cohort study will identify factors associated with survival of dogs with DMVD in the primary-care setting.