Degenerative mitral valve disease in dogs attending UK practices

Mattin MJ¹, Boswood A¹, Church DB¹, McGreevy PD², Thomson PC², Brodbelt DC¹

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

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 Compass 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).

M&M

Descriptive statistics
Veterinary-diagnosed DMVD cases
- Age disease first recorded:
  - Mean: 9.52 years (standard deviation: 3.20)
- Maximum recorded bodyweight: Median: 11.3 kg (IQR 8.4 – 16.3 kg)
- 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)

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 4,366 dogs.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds ratio</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breed</td>
<td></td>
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<tr>
<td>Cavalier King Charles Spaniel</td>
<td>47.05</td>
<td>25.82 - 85.74</td>
<td>&lt;0.0001</td>
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<tr>
<td>King Charles Spaniel</td>
<td>30.65</td>
<td>11.03 – 85.21</td>
<td></td>
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<tr>
<td>Chihuahua</td>
<td>5.11</td>
<td>1.79 – 14.65</td>
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<tr>
<td>Poodle</td>
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<td>Border Collie</td>
<td>1.83</td>
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<tr>
<td>Miniature Schnauzer</td>
<td>1.79</td>
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<tr>
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<tr>
<td>Purebred Other</td>
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<tr>
<td>Crossbreed</td>
<td>Baseline</td>
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<tr>
<td>Cocker Spaniel</td>
<td>0.89</td>
<td>0.40 – 1.95</td>
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<tr>
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<td>0.77</td>
<td>0.16 – 3.76</td>
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<td>0.15 – 2.64</td>
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<td>Labrador retriever</td>
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<td>0.22 – 1.38</td>
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<tr>
<td>Lhasa Apso</td>
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<td>West Highland White Terrier</td>
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<td>Staffordshire Bull Terrier</td>
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</table>

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

References

Results
Prevalence estimate
Variable Odds ratio 95% CI P-value
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English Springer Spaniel 0.10 0.01 – 0.87

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.