Oral presentations

Thoracic computed tomography findings in dogs naturally infected with *angiostrongylus vasorum*

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BACKGROUND

Angiostrongylus vasorum (*A. vasorum*) is an important emerging disease of wild and domestic canidae. Cardiorespiratory signs due to parasitic pneumonia are a common clinical manifestation in many infected patients, and as such thoracic imaging is critical in diagnosing and monitoring disease progression or resolution. Although computed tomography (CT) is now widely available in the United Kingdom (UK), currently there is no description of the thoracic CT appearance of parasitic pneumonia caused by natural infection with *A. vasorum* in dogs.

AIMS

To review clinical data and findings from thoracic CT in dogs naturally infected with *A. vasorum* and to identify any consistent changes that may aid in diagnosis, management and prognostication.

METHODS

Nine UK referral centre's clinical and imaging databases

were searched using keywords for cases which would fulfil the following criteria:

1. Confirmed diagnosis of *Angiostrongylus vasorum*
2. Complete clinical notes with owners' permission
3. Thoracic CT scan of diagnostic quality within 14-days of diagnosis
4. Absence of significant concurrent disease

Any dogs identified had a retrospective analysis of clinical records and thoracic CT sequences. All CT sequences were acquired using a helical CT unit under general anaesthesia or sedation using a similar protocol in each centre. A single board certified specialist reviewed all imaging findings.

RESULTS

Six out of nine centres had cases that fulfilled the inclusion criteria; eighteen dogs were included in the study. All cases had multiple lung lobes affected bilaterally. The right cranial, caudal, accessory and left caudal lobes were affected in all animals. The right middle and left cranial lobes were affected in the majority of cases (n=16). The predominant abnormality was an alveolar and interstitial lung pattern in peripheral lung lobes, increased lung opacity with alveolar and interstitial pattern within the pleural and subpleural regions, resulting in a clear delineation between the subpleural and peribronchial zones.

CONCLUSION

This study is the first to provide information about the thoracic CT findings in dogs naturally infected with *A. vasorum*. The finding on CT of alveolar and interstitial lesions in peripheral lung lobes is suggestive of pneumonia secondary to *A. vasorum*, with or without cardiorespiratory signs. CT can contribute valuable information, which can localise pulmonary changes and characterise intra-thoracic pathology associated with *A. vasorum*. Further studies to compare the results of thoracic radiography to CT would be useful.

Molecular detection of vector-borne pathogens in blood and spleen samples from dogs undergoing splenectomy

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This retrospective study aimed to evaluate certain Vector-Borne Pathogens (VBP) in samples from dogs presenting splenic lesions.

Stored EDTA-blood and surgically obtained spleen samples were analyzed. *Leishmania infantum*, *Ehrlichia/Anaplasma* spp., *Hepatozoon canis*, *Babesia* spp., *Theileria annae*, *Rickettsia* spp., *Bartonella* spp. and *Mycoplasma* spp. were targeted using PCR assays. Dogs without evidence of splenic abnormalities under imaging assessment were included in the control group. Medical records of all the dogs were reviewed.

Fifty-seven EDTA-blood and 49 spleen samples from 58 splenectomized dogs and 60 EDTA-blood samples from control dogs were analyzed. Histopathology was performed in 49 cases. The 57.1% of the biopsies (28/49) were consistent with benign lesions and 42.9% (21/49) with malignancy [mostly hemangiosarcoma (17/21)]. Clinical data reflected that 8 dogs had been previously diagnosed with IBD; splenic lesions were detected in the 87.5% [most of them benign processes (6/7)].

PCR yielded positive results in 12 cases (20.7%):

Rickettsia massiliae (n=1), *Babesia canis canis* (n=3), *Babesia gibsoni* (n=2) and similar sequences of hemotropic *Mycoplasma* spp. (n=2), in blood; *Leishmania infantum* (n=1), *Ehrlichia canis* (n=1), *Babesia canis canis* (n=1) and *Babesia gibsoni* (n=1), in spleen. Two control dogs (3.3%) showed positivity to *Babesia gibsoni* (n=1) and *Hepatozoon canis* (n=1). The 58.3% of dogs infected presented benign lesions (7/12), 3 with IBD; the remaining 41.7% were diagnosed with malignancies (5/12).

Infection resulted a predisposing factor for splenic diseases ($p=0.004$, $OR=7.56$). Relationship between the type of splenic lesion and positivity to VBP was not significant ($p=0.94$), although association between *Babesia canis canis* and hemangiosarcoma was found ($p=0.004$). IBD was related to detection of VBP ($p=0.02$) and the presence of

splenic lesions ($p=0.025$) but not to the type of splenic disease ($p=0.123$).

Main findings suggest that positivity to VBP could be related to splenic diseases. We hypothesize that the relevant immunological role of the spleen could predispose to alterations of this organ in the presence of VBP. Furthermore, *Bartonella* spp. has been proposed to be involved in the pathogenesis of vasoproliferative tumors. Interestingly, all dogs with *Babesia canis canis* presented hemangiosarcoma in the present survey. The real relationship between IBD, splenic diseases and positivity to VBP could not be established. Coincidental with previous publications, results support that diagnosis of VBP could be improved by analysis of samples from different tissues. The number of dogs included here warrants further investigation.

Antibacterial dispensing behaviour in a large sentinel network of dog and cat practices in the UK

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Antimicrobial resistance (AMR) has been described as one of the greatest current challenges to the future of both veterinary and human health, with antibacterial usage a key driver in AMR development. However, information on how antibacterials are dispensed, particularly in companion animals, has to date been limited, restricting the ability of the veterinary profession to respond to the challenge of AMR in an informed manner. The Small Animal Veterinary Surveillance Network (SAVSNET) is a collaborative project between the University of Liverpool and the BSAVA, which collects large volumes of electronic health records from UK veterinary practices and diagnostic laboratories to improve companion animal-disease surveillance at local, regional and national scales.

In addition to health data and the owner's full postcode gathered in real-time at each consultation, SAVSNET captures the 'items dispensed'. A regular expressions approach was utilised to produce a list of word roots (n=366) to identify dispensed antibacterial products. Antibacterial dispensing

consultations were then identified with data collected over an 18-month period (17/03/2014 to 24/09/2015) from 307 veterinary sites across the UK, consisting of 391,132 canine (175,789 dogs) and 154,222 feline consultations (87,247 cats). Proportions and confidence intervals (95%) were calculated using robust standard errors to allow for the clustering within individual veterinary sites.

For dogs and cats, 83,697 (21.4%) and 31,297 (20.3%) of all consultations respectively involved at least one antibacterial-containing product being dispensed. In dogs, 83.6% (81.9-85.3); 11.3% (9.7-12.9) and 5.1% (4.5-5.7) of dispensed antibacterial products were veterinary-licensed; human-licensed or generic dual-licensed drugs, respectively. This compared with 90.4% (89.6-91.2); 4.9% (4.4-5.4) and 4.7% (4.1-5.3) in cats. The most commonly dispensed antibacterial in dogs was clavulanic-acid-potentiased-amoxicillin (28.2% (26.7-29.7) of antibacterial products dispensed), consistent with previous studies. For cats, the most commonly dispensed antibacterial was cefovecin (34.8% (31.4-38.2)), in contrast to an earlier study where amoxicillin was most commonly dispensed. Fluoroquinolones comprised 4.7% (3.8-5.6) and 3.3% (1.6-5.0) of dispensed antibacterials in dogs and cats, respectively. During the study period, no vancomycin or teicoplanin (glycopeptides); meropenem or imipenem (carbapenems) containing-products were dispensed in any animal species.

The methodology describes a near real-time antibacterial dispensing surveillance system that will allow SAVSNET to describe geographical and temporal dispensing trends, and dispensing based on syndromic information. As demonstrated, the system will also allow active monitoring for veterinary usage of key antibacterials recommended as 'reserved' for human health.