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Factors influencing common diagnoses made during first-opinion small-animal consultations in the United Kingdom

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ABSTRACT

It is currently unclear how frequently a diagnosis is made during small-animal consultations or how much of a role making a diagnosis plays in veterinary decision-making. Understanding more about the diagnostic process will help direct future research towards areas relevant to practicing veterinary surgeons. The aim of this study was to determine the frequency with which a diagnosis was made, classify the types of diagnosis made (and the factors influencing these) and determine which specific diagnoses were made for health problems discussed during small-animal consultations.

Data were gathered during real-time direct observation of small-animal consultations in eight practices in the United Kingdom. Data collected included characteristics of the consultation (e.g. consultation type), patient (e.g. breed), and each problem discussed (e.g. new or pre-existing problem). Each problem discussed was classified into one of the following diagnosis types: definitive; working; presumed; open; previous. A three-level multivariable logistic-regression model was developed, with problem (Level 1) nested within patient (Level 2) nested within consulting veterinary surgeon (Level 3). Problems without a previous diagnosis, in cats and dogs only, were included in the model, which had a binary outcome variable of definitive diagnosis versus no definitive diagnosis.

Data were recorded for 1901 animals presented, and data on diagnosis were gathered for 3192 health problems. Previous diagnoses were the most common diagnosis type (n = 1116/3192; 35.0%), followed by open (n = 868/3192; 27.2%) then definitive (n = 660/3192; 20.7%). The variables remaining in the final model were patient age, problem history, consultation type, who raised the problem, and body system affected. New problems, problems in younger animals, and problems raised by the veterinary surgeon were more likely to result in a definitive diagnosis than pre-existing problems, problems in older animals, and problems raised by the owner. The most common diagnoses made were overweight/obese and periodontal disease (both n = 210; 6.6%).

Definitive diagnoses are rarely made during small-animal consultations, with much of the veterinary caseload involving management of ongoing problems or making decisions around new problems prior to a diagnosis being made. This needs to be taken into account when considering future research priorities, and it may be necessary to conduct research focused on the approach to common clinical presentations, rather than purely on the common diagnoses made. Examining how making a diagnosis affects the actions taken during the consultation may shed further light on the role of diagnosis in the clinical decision-making process.

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1. Introduction

A diagnosis has been defined as 'the label given to a disease with certain clinical or pathologic characteristics applicable to a particular case' (Radostits et al., 2000) and are sought because they

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can influence the clinical work-up and outcome of cases, as well as being useful for billing and administrative purposes. In first-opinion veterinary practice, a definitive diagnosis may not always be reached, yet decisions on how to manage cases still have to be made. In medicine, it has been suggested that diagnoses are only useful where they influence decision-making, by changing the action taken, changing the eventual outcome of a case or providing a prognosis (Del Mar et al., 2006). Evidence on the diagnostic process in general practice is limited in human healthcare, particularly in terms of assessing the quality of the diagnosis made and the impact of making a diagnosis on patient outcomes (Foot et al., 2010).

It is currently unclear how making a diagnosis influences the decisions made during veterinary consultations. Understanding veterinary decision-making is vital to the process of evidence-based veterinary medicine (EVM), as the aim of EVM is to aid clinicians in making the best decisions for their patients (Dean et al., 2015). Determining how frequently a diagnosis is reached will further our understanding of the role of diagnosis in the decision-making process. In a previous study, Lund et al. (1999) found that a diagnostic code was assigned for only 36% of patient records, however this included transactions not involving a consultation, and so the rate of diagnosis in small-animal consultations remains unclear. Further research is needed to determine which factors influence whether a diagnosis is reached, such as the type of problem, the type of patient (e.g. species), which consulting veterinary surgeon is seen, and which practice is visited, as well as the common diagnoses made. Recent research by the Centre for Evidence-based Veterinary Medicine has suggested that consultations are highly complex with multiple different problems discussed (Robinson et al., 2015a), with the electronic patient record potentially limited in how much complexity it can capture (Jones-Diette, 2014). Examining the types of diagnoses made during small-animal consultations in detail, for all problems discussed, will allow future research and education to be targeted towards common decision-making points.

The primary aim of this study was to determine the frequency with which a diagnosis was made, classify the types of diagnosis made, and to determine the factors influencing these diagnoses during first-opinion small-animal consultations. The secondary aim was to determine which specific diagnoses were made for problems receiving a diagnosis during these consultations.

2. Materials and methods

2.1. Practice selection

A convenience sample of eight first-opinion veterinary practices was recruited (Robinson et al., 2015a). Practices recruited were those involved in a previous study (Dean et al., 2013), or those who had expressed interest in working with the Centre for Evidence-based Veterinary Medicine (CEVM). All eight practices approached agreed to take part in the study. Eight practices in total were chosen as this was considered to be the maximum number of practices which could feasibly be studied using the methods selected. Six practices were located in England (three in the Midlands and three in the South) and two practices were located in Scotland. Five practices treated small animals only, while three practices also treated farm and equine patients. Three practices were single branch only, while five practices had two or more branches. The median number of veterinary surgeons carrying out small-animal consultations per practice was 8 (range 3–20). The median years qualified of all veterinary surgeons observed was 14.3 (range 1–40 years). Of the 62 veterinary surgeons observed, 12 (19.4%) were certificate holders. Further details on the sample of practices involved in the study are reported in Robinson (2014).

2.2. Data-collection tool

2.2.1. Development of the tool

A data-collection tool was developed to allow the collection of complex data by real-time direct observation during small-animal consultations at participating practices. The tool consisted of a series of open and closed questions on a paper form and was used to gather data on various characteristics of the consultation, patient presented, and all problems discussed. Following initial development of the tool, pre-test and pilot studies were conducted between August 2010 and March 2011 to help identify any issues relating to design of the data-collection tool or feasibility of data collection. Pre-testing involved collection of data by the primary investigator (NR) and another author (RD) during a single morning each at two of the practices, in August 2010. A pilot study was then conducted between September 2010 and March 2011, with data collected by the primary investigator during a single day at each of the eight practices. An inter-rater reliability assessment of the tool was carried out in May 2012. Development, testing, and utilisation of the data-collection tool has been described in more detail previously (Robinson et al., 2015a).

2.2.2. Data collected

Data were collected on all problems discussed during the consultation. A problem was defined as 'any two-way discussion between owner/carer and vet regarding any aspect of the patient's health and wellbeing'. The reason for presentation (as stated by the owner or veterinary surgeon) or first problem raised where this was not stated, was considered to be the 'presenting problem'; each additional problem discussed was considered to be a 'non-presenting problem'. Each problem discussed was considered to be either a preventive-medicine problem if it related to the prevention of disease or injury (e.g. vaccination) or a specific health problem if it related to a health problem currently affecting the animal (e.g. vomiting and diarrhoea). All problems relating to preventive medicine were excluded from the analysis because a diagnosis was not relevant for these particular problems; however all specific health problems were included in analysis, including those raised during preventive-medicine consultations.

Data collected on characteristics of the consultation and patient included patient signalment; type of clinical examination performed (one selected from: None; Full; Focused); type of consultation (preventive-medicine consultation if the presenting problem related to preventive medicine, specific health-problem consultation if the presenting problem was a current health problem); whether the patient was weighed; total number of problems discussed during the consultation. Data on the individual breed of each patient presented were recorded, and were later condensed into a binary variable of purebred or crossbreed for analysis purposes. Data collected for each specific health problem included: problem history i.e. whether the problem was new or pre-existing; whether the problem was first raised by the veterinary surgeon or owner; the body system affected by the problem; whether there were any diagnostic tests performed for that problem; diagnosis type; specific diagnosis. Definitions were developed for consultation type, clinical examination type, problem history, body system affected, and diagnostic testing to ensure consistent categorisation (Appendix A). Further details around the development and coding of these variables have been discussed in previous publications (Robinson et al., 2015a,b, 2016).

2.2.3. Diagnosis type

Initially, a simple 'yes/no' closed field was included in the data-collection tool to record whether a diagnosis had been reached for each problem (including both presenting and non-presenting specific health problems). However, during the pre-test it was found

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