

ORIGINAL RESEARCH

Study to determine clinical decision thresholds in small animal veterinary practice

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Introduction

Like all medical professionals, veterinarians must often make clinical decisions based on imperfect or incomplete information. However, balancing one's expertise and experience with current scientific data and evidence-based recommendations can be incredibly challenging. In an effort to minimise bias, evidence-based medicine often employs clinical decision-making models.

The threshold model of diagnosis is a theoretical framework that explains an implicit process through an explicit formula. This model has two thresholds: a 'test threshold' and a 'treatment threshold'.

The objective of this study was to determine these clinical decision thresholds for six common conditions encountered in small animal veterinary practice. Establishing these thresholds may provide insight into the rationale for clinical decisions made by small animal veterinarians. They may also support the establishment of clinical decision rules, which are significant in human medicine yet remain to be investigated in veterinary medicine.

Approach

Participants were provided with an online survey. Demographic and background information was collected at the beginning of the survey. Five questions then described

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KEY FINDINGS

- Clinical decision thresholds were determined for two commonly encountered conditions in small animal practice – urinary tract infection (UTI) and mechanical gastrointestinal obstruction (GIO).
- The probability of treating for UTI was significantly affected by the clinician's gender and whether internship training had been completed. However, there appeared to be no interaction between these two factors.
- For GIO, both the probability of testing and the probability of treating were influenced by individual clinician characteristics.

scenarios of canine patients with suspected panosteitis, hypothyroidism, urinary tract infection (UTI), mechanical gastrointestinal obstruction (GIO) and idiopathic epilepsy, and one question described a feline patient with suspected chronic kidney disease. A range of probabilities was applied to each scenario.

Test and treatment threshold levels were computed for each scenario from 297 usable responses. Threshold models were adjusted in order to account for clinician characteristics and a backward selection based on the Akaike Information Criterion was carried out in order to select the final model. Interactions between gender and age and between gender and internship completion were also tested in the initial multivariate model.

Results

The test and treatment thresholds were determined for UTI (test=12.8 per cent, treatment=82 per cent) and GIO (test=3.2 per cent, treatment=87.3 per cent). In all other scenarios, the data obtained did not allow interpretable test and treatment thresholds to be calculated.

The probability of treating for UTI was

significantly affected by the gender of the clinician and whether an internship had been completed. However, there was no interaction between these two factors in the selected model. Women were less predisposed to treat than men (OR=0.62, P=0.09), and clinicians that had not completed internship training were estimated to be more inclined to treat (OR=3, P<0.001).

In the case of GIO, both the probability of testing and the probability of treating were influenced by individual clinician characteristics. Clinicians that had not completed internship training were less inclined to test (OR=0.29, P=0.008), as were respondents that identified their area of practice as 'other' (OR=0.17, P=0.007). General practitioners were more predisposed to treat (OR=2.96, P=0.04).

Interpretation

This study succeeded in determining test and treatment thresholds for two commonly encountered conditions in small animal practice: UTI and GIO. The veterinarians that completed the survey were comfortable simply observing when the likelihood of a UTI was less than 13 per cent and were comfortable treating when the likelihood of a UTI was greater than 82 per cent.

They were also comfortable simply observing the patient when the likelihood of a GIO was less than 3 per cent and were comfortable performing an abdominal exploratory surgery when the likelihood of a GIO was greater than 87 per cent.

Multivariate analysis revealed that a clinician's area of practice, postgraduate training completed and gender may play a part in their clinical decision making for cases like suspected UTI and GIO.

Significance of findings

This study explored the factors that may have an impact on clinical decisions and established clinical decision thresholds for two commonly encountered conditions in small animal practice. These thresholds may be used as the basis for clinical decision rules for use in small animal practice.