Pharmacists' Knowledge of Veterinary Pharmacotherapy and the Impact of an Educational Intervention

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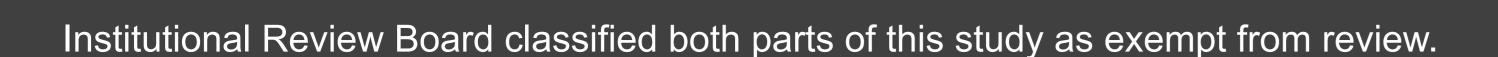
Background

- Numerous factors have led to a significant increase in veterinary prescriptions sent to community or online pharmacies.[1]

- Retail pharmacies have actively pursued this new source of revenue.

- According to a 2012-2013 survey of 707 veterinarians, one-third knew of a dispensing error that occurred at a community pharmacy. Of those reports, one-tenth resulted in harm to the animal.[2]

- In 2015, only 4% of graduating pharmacists received any veterinary pharmacotherapy training.[8]

Purpose

- To date, there is very limited data regarding pharmacists' preparedness to handle animal prescriptions. The goal of this study was to fill this research gap by investigating pharmacists' baseline knowledge of veterinary pharmacotherapy, and evaluate the knowledge improvement resulting from a veterinary pharmacotherapy training program.

Methods

A 17-item multiple choice assessment was developed to assess pharmacists' knowledge of core concepts required to safely dispense medications to animal patients. Items selected were based on dispensing errors most commonly reported in available literature.

Institutional Review Board classified both parts of this study as exempt from review.

A baseline assessment was disseminated to all licensed pharmacists in NC. Data was collected via SurveyMonkey.®
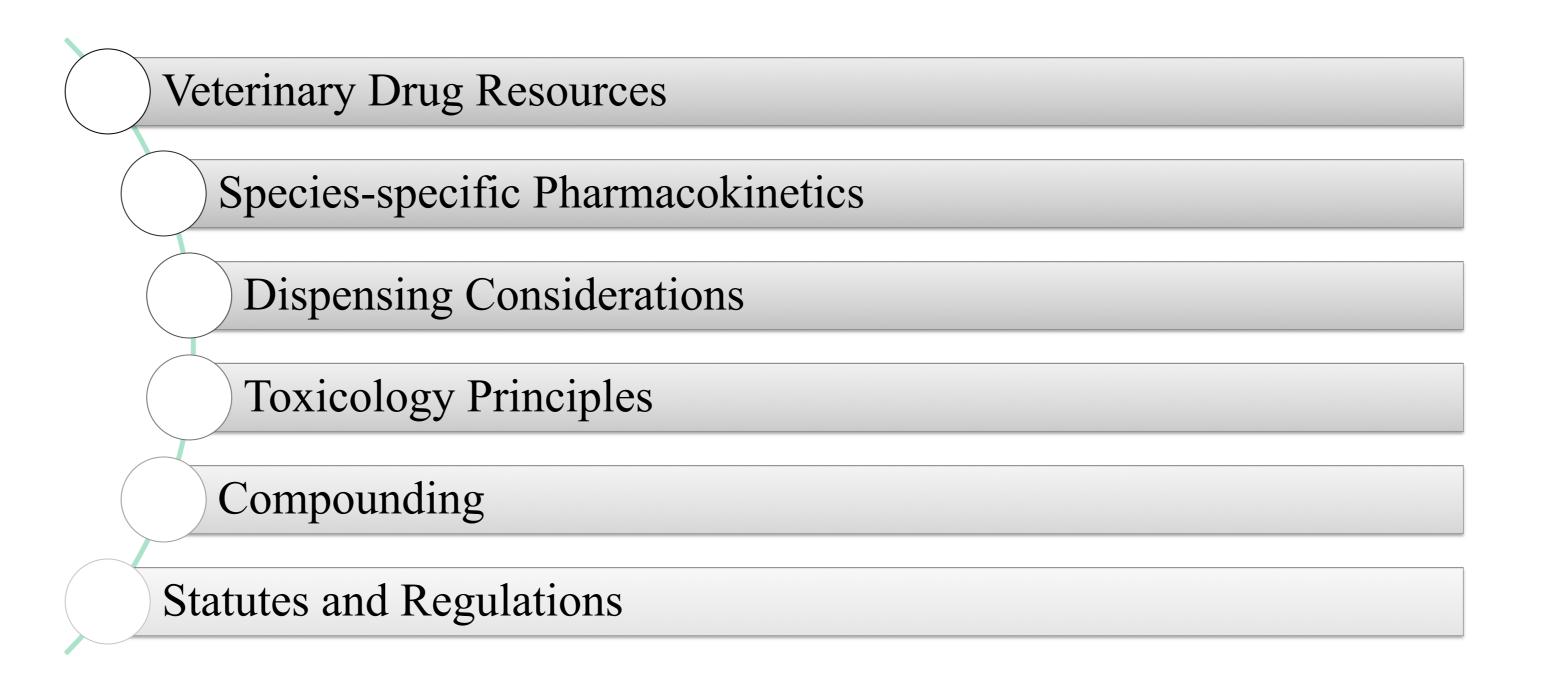
A pilot study was conducted involving a convenience sample of pharmacists located in NC. Participants were involved in an educational intervention focusing on pertinent veterinary pharmacotherapy concepts and were assessed pre- and post-tests. Data was anonymously collected via SurveyMonkey.®

Data was exported for analysis which consisted of scoring the data with Winsteps measurement software. Results were then exported to SPSS statistical software for further analysis.

Education Intervention Concepts

- Veterinary Drug Resources
- Species-specific Pharmacokinetics
- Dispensing Considerations
- Toxicology Principles
- Compounding
- Statutes and Regulations

Results – Statewide Assessment

- In total, 602 participants fully completed the study, resulting in a response rate of 5.04% (MOE 3.37%; 95% CI).

- Participants' scores were normally distributed with scores ranging from 1 to 16, a mean of 5.88 (SD = 2.63) and a median of 5.

- Given both the mean and median raw scores approximated 5 to 6 (out of 17 items), this corresponds to an **overall success rate of 29.41% to 35.29%** for the sample.

- The comparison between demographic parameters showed a statistically significant difference ($p < 0.001$) to those without prior veterinary training (n=548, 33.1% accuracy) and those with previous training (n=54, 49.8% accuracy).

Results – Pilot Program

- Of the 60 individuals invited to participate, all 60 (100%) completed the pre-test and 44 (73.33%) completed the post-test.

- With respect to the pre-test, scores largely were normally distributed. Given both the mean and median raw score was 5 our of 17 items correct, this corresponds to an **overall success rate of 29.4%.**

- With respect to the post-test, the average score increased to about 16 out of 17 correct, corresponding to an overall success rate of 94.1%.

- When comparing group performance between the pre- and post-tests, **pharmacists' scores more than doubled with a 64.7% increase in performance** ($p < 0.001$).

Discussion

- The results of this study showed that pharmacists lack an understanding of core concepts required to safely dispense medication to animal patients.

- In both baseline assessments, the success rate was only slightly better than random chance (25%).

- There were no discernible differences in participants' knowledge based on the subject matter of the question (pathophysiology, dosing, counseling, compounding, legality and toxicology).

- In the statewide assessment, 41.3% said they would dispense xylitol, a potentially lethal animal toxicant, to a canine patient.

- Several participants chose to withdraw from the study because there wasn't an "I don't know" option, indicating any resulting values may overestimate pharmacists' knowledge.

- The results of the pilot study strongly support increased education in pharmacy schools and training through professional organizations.

Limitations

- The pilot program organization was chosen as a convenience sample.

- Research was conducted in NC, a survey area where two of the three pharmacy schools nearby offer veterinary pharmacy exposure. Results may differ in other geographies.

- In the pilot study, participants' pre- and post-test data could not be compared due to the anonymous nature of the assessment.

- Validity threats, although these were kept minimal through various means.

CONCLUSIONS

- This study demonstrates the importance of veterinary pharmacology education for pharmacists, a concept highly encouraged by the American Veterinary Medical Association (AVMA).[5]

- A substantial portion of pharmacy graduates lack the knowledge they need to adequately handle the most commonly received prescriptions they will encounter in retail practices.

- Results support the National Association of Boards of Pharmacy (NABP)'s stance that pharmacists dispensing medications for veterinary patients should possess competence to do so and have access to quality veterinary drug references.[6]

- There is a need for the development of additional strategies to disseminate effective veterinary pharmacology education and practice experience.