The Effect of Andrographolide on the Metabolism of Carbamazepine in Rats

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Presenters
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STATEMENT OF THE PROBLEM

Background
Carbamazepine (Tegretol) (CBZ)
- A medication that is most commonly used as an anticonvulsant in patients who experience seizures.1
- Metabolized in the liver by the enzyme Cytochrome P450-3A4 (CYP3A4) and Cytochrome P450-2C8 (CYP2C8).2,3
  - If drugs affect CYP enzyme activity, in turn influencing how the liver metabolizes drug, it influences how the drug functions in the body.
- Inhibitors or inducers of CYP3A4 or CYP2C8 would alter CBZ drug therapy.

Andrographis paniculata (AND)
- An inhibitor of CYP according to previous research that found it significantly decreased CYP enzyme activity.4
- A medicinal plant excessively used in Asian countries for the treatment of multiple ailments including fungal infections, bacterial infections, inflammatory diseases, hypertension, viral infections, and cancer.5,6,7,8,9,10
- AND is a widely used OTC supplement often used without the provision of a prescription

It is necessary to study possible drug interactions with this herb. While no published studies analyze CBZ and AND coadministration, based on studies of each alone, interactions theoretically exist. This study is about the theoretical herb-drug interaction that can occur through the coadministration of AND and CBZ.

Significance of the Problem
AND and CBZ have very different uses, which might cause an individual with comorbidities to take both at the same time. Since AND is used as an OTC supplement without their prescriber’s knowledge there could have drastic consequences for individuals due to possible, unknown drug interactions. As researchers have not yet studied this possibility of an interaction, it is imperative that they analyze interactions between carbamazepine and andrographolide, a goal this study seeks to fulfill.

STUDY DESIGN

Objectives
To determine if andrographolide impacts the pharmacokinetics of carbamazepine

HYPOTHESES

Null Hypothesis: Andrographolide will have no statistically significant impact on the pharmacokinetics of carbamazepine.

Alternative Hypothesis: Andrographolide will have a statistically significant impact on the pharmacokinetics of carbamazepine.

REFERENCES


PROJECT TIMELINE

- Obtain IACUC Approval
- Perform Experiment
- Perform Analysis on Rat Plasma Samples
- Report Results and Conclusions

LIMITATIONS

The study has a small sample size which is not generalizable to the entire rat population. The results obtained in rat studies may not translate to human subjects.

FUTURE DIRECTIONS

The goal of this study is to contribute to the literature on andrographolide’s drug interactions and to provide more information for future herb-drug interaction studies.

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