CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
J1403

Project Title
Determining a Dose of Acyclovir in the Horse

Abstract

Objectives/Goals
A correct dosage of acyclovir for the horse is not known even though it has been used by veterinarians to treat equine herpes virus (EHV-1). The maximum dose in humans is 800 mg because giving more does not increase the concentration in the serum. This study was designed to answer the question is dosing by surface area or by weight a better approach when extrapolating human doses to much larger animals like the horse.

Methods/Materials
Three adult horses were prepared with IV catheters and given 3.2 g of acyclovir (4 x the human dose based on a horse having 4 times its surface area) and on the following day 6.4 grams of acyclovir (8 x the human dose based on a horse weighing 8 times as much as a human). Blood samples were taken at specific times during the study and acyclovir concentration in the serum determined by HPLC at NC State University.

Results
Serum concentrations showed little differences between the two doses which is the same as what is seen in humans. Concentrations of acyclovir changed little over 8 hours indicating that absorption was due to a constant amount being absorbed rather than a percentage. This is what is also seen in human.

Conclusions/Discussion
Doubling the dose of acyclovir in the horse did not double the serum concentrations just as hypothesized because of how it is absorbed.
Serum concentrations of acyclovir were lower in the horse compared to man using either dosing strategy. The current accepted horse dose of 10-12 grams would not be expected to produce any higher serum concentrations than a dose based on surface area differences between a horse and man (3.2 grams) but would cost 4 times as much. Acyclovir is best given at 3.2 grams since doubling the dose does not increase its concentrations in the serum very much.

Summary Statement
Determining a correct dose of acyclovir in the horse by extrapolating the human dose using two different methods.

Help Received
Dr Dave Aucoin (my father), Dr Rick Stevens (my veterinarian). Lorri Aucoin (my mother).