

**Cairo University
Faculty of Veterinary Medicine
Pharmacology Department**

**PHARMACOKINETIC PHARMACODYNAMIC
MODELING OF CEFQUINOME IN SUCKLING
CALVES NORMAL AND WITH RESPIRATORY SIGNS**

Thesis Presented

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Title of thesis: Pharmacokinetic pharmacodynamic modeling of cefquinome in suckling calves (normal and with respiratory signs).

Abstract

Pharmacokinetics and pharmacodynamics of cefquinome were studied in calves after intramuscular injection of cefquinome (2mg/kg B.WT) healthy and diseased calf alone and in combination with flunixin (1mg/kg BW). Cefquinome was detected in plasma of calves from 5.0 minutes to 24 h. following IM injection. Cefquinome peak concentration C_{max} in healthy calves was ($0.783 \pm 0.088 \mu\text{g/ml}$), and with co-administration with flunixin 0.906 ± 0.102 and $0.916 \pm 0.037 \mu\text{g/ml}$, respectively. The T_{max} in healthy calves ($0.66 \pm 0.09 \text{ h.}$) and $0.90 \pm 0.10 \text{ h.}$ in diseased calves treated with cefquinome alone and $1.05 \pm 0.20 \text{ h}$ diseased calves treated with cefquinome and flunixin. Pharmacokinetic/ Pharmacodynamic modeling after intramuscular administration of cefquinome in diseased calves treated with cefquinome (2 mg/kg B.WT) and with flunixin for 5 days, the clinical parameters showed rapid recovery in all treated groups. From the obtained data it could be concluded that cefquinome act effectively in treatment of bacterial respiratory disease in calves as well as the co-administration of flunixin with cefquinome showed highly synergistic activity in treatment of bacterial respiratory disease (Pasteurella infections) in suckling cow calves.

Dedication

*I wish to introduce my deep gratitude and
utmost Thanks to:*

My parents

&

Special thanks to

My wife

For her continuous encouragement to

Complete this work,

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First and foremost, I greatly indebted in all my work and success to our gracious Allah.

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List of pharmacokinetics abbreviations

A: The intercept of the elimination phase with the vertical axis after parenteral administration.

Alfa: rate constant for drug absorption (h^{-1})

Beta: rate constant for drug elimination (h^{-1})

AUC_{0-inf}: Total area under the serum drug concentration versus time curve from $t=0$ to $t=\text{infinity}$ after administration of a single dose ($\mu\text{g.ml/h}$).

AUMC : Total area under the plasma drug concentration multiplied by time versus time curve from $t=0$ to $t=\text{time of last taken sample}$ after administration of a single dose ($\mu\text{g.ml/h}$).

C_{max}: Maximum serum concentration of drug in blood after parenteral administration ($\mu\text{g/ml}$).

T_{max}: The time at which the drug reached the maximum concentration after parenteral administration

K₁₀: Rate constant for central compartment distribution (h^{-1})

K_{alfa}: Rate constant for absorption (h^{-1})

K_{beta}: First order elimination rate constant for disappearance of drug from central compartment (h).