.Cairo University
Faculty of Veterinary Medicine
Department of Pharmacology

Effect of prebiotic on disposition and tissue residues of tylvalosin in apparently healthy and *Mycoplasma gallisepticum* infected broiler chickens

Thesis presented by

Ammar Haki Salman
(M.V.Sc. Baghdad University, 1997)

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Under Supervision of

Prof. Dr. Amer Ramadan Ali Ayad
Professor and Head of Pharmacology Department
Faculty of Veterinary Medicine
Cairo University

Prof. Dr. Salah El-Din Abdel Hamid Mohamed Youssef
Professor of Pharmacology
Faculty of Veterinary Medicine
Cairo University

Dr. Ahmed Mohamed Galal Mohamed
Assistant Prof. of Pharmacology
Faculty of Veterinary Medicine
Cairo University
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Supervisors

Prof. Dr. Amer Ramadan Ali Ayad
Professor and Head of Pharmacology Department
Faculty of Veterinary Medicine
Cairo University

Prof. Dr. Salah El-Din Abdel Hamid Mohamed Youssef
Professor of Pharmacology
Faculty of Veterinary Medicine
Cairo University

Dr. Ahmed Mohamed Galal Mohamed
Assistant Prof. of Pharmacology
Faculty of Veterinary Medicine
Cairo University

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Name: **Ammar Haki Salman**
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2- Prof. Dr. Salah El-Din Abdel Hamid Mohamed Youssef.
3-Dr. Ahmed Mohamed Galal Mohamed.

Abstract

A study of tylvalosin pharmacokinetics was conducted in healthy, health pretreated with prebiotic, *Mycoplasma gallisepticum*-infected and *Mycoplasma gallisepticum*-infected pretreated with prebiotic broiler chickens. Tylvalosin was administered intravenously and orally as a single dose of (25 mg/kg b.wt.) to determine its concentrations in blood as well as its kinetic disposition, the oral dose was repeated for 5 consecutive days to determine the tissues residues.

The serum concentration - time curve indicated a two-compartment open model. Following intravenous injection, the mean elimination half-lives ($t_{1/2\beta}$) of (6.666±0.285, 6.501±1.143, 3.048±0.232 and 4.284±0.204 h) The apparent volume of distribution ($V_{d(area)}$) of tylvalosin was (3.802±0.148, 6.362±0.390, 0.657±0.367 and 6.080±2.928 L/Kg) with body clearance CL_{β} (0.953±0.040,1.792±0.062, 1.976±0.743 and 3.592±0.532 L/kg/h) with mean of MRT was (9.314±0.407, 7.533±0.735, 1.739±0.779 and 4.853±0.388 h) in four groups, respectively. Following oral administration, tylvalosin was absorbed with ($t_{½\alpha}$) of (0.963±0.045, 0.906±0.025, 0.958±0.207 and 0.956±0.030 h) with peak serum concentration ($C_{max)}$ of (1.226±0.024, 0.873±0.009, 0.0760±0.024 and 0.854±0.020 µg/ml) at ($t_{max)}$ of (1.723±0.041, 1.441±0.023, 1.310±0.055 and 1.472±0.025 h) and eliminated with ($t_{½\beta}$) of (3.504±0.049, 3.600±0.165, 3.862±0.103 and 3.132±0.114 h) in four groups, respectively. The systemic bioavailability of Tylvalosin (F%) following oral administration was (47.491±0.538, 52.853±0.416, 72.96±0.003 and 88.652±6.714 %) in four groups, respectively.

After single intravenous and oral dose the highest level of drug was concentrated in lung tissue comparable with other tissues, and after repeated oral doses the drug was still detected in lung tissue after 196 hour of the last dose while it is not detected in other tissues.

It is to conclude that serum and tissues tylvalosin concentration following twice-daily dose of (25 mg/Kg b. wt./day) were suitable to maintain its therapeutic regimen for treatment of mycoplasma infection in broiler chickens, in addition mycoplasma infection and prebiotic significantly decrease and/or consumed serum concentration, increased elimination rate so it is recommended that dose rate is adjusted in case of mycoplasma infection. Furthermore, tylvalosin should be withdrawn at least 8- 10 days, before marketing to ensure that the drug is completely eliminated from tissues.

Oh, Allah, this matter began from you, continued by you
and its end is upon you, so I beg you to accept it from me,
you are the most forgiving, the most merciful

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﴿أَلَا يَعْلَمُ مَنْ خَلَقَ وَهُوَ اللَّطِيفُ الْخَبِيرُ ۞ هُوَ الَّذِي جَعَلَ لَكُمُ الْأَرْضَ ذَلُولًا فَامْشُوا فِي مَنَاكِبِهَا وَكُلُوا مِنْ رِزْقِهِ وَإِلَيْهِ النُّشُورُ﴾

سورة الملك:

الآيات (14-15)

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