SOME PHARMACOLOGICAL STUDIES ON CEFTRIAXONE IN MALE RATS

A Thesis

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By

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بعض الدراســـات الفارماكولوجية على

السفترياكسون في ذكور الفئران

رسالة

مقدمة إلى الدراسات العليا بكلية الطب البيطري – جامعة الإسكندرية

استيفاء للدراسات المقررة للحصول على درجة

الماجستير في العلوم الطبية البيطرية

تخصص

الأدوية البيطرية

مقدمة من

ط.ب./ نشوة عبد العزيز محمود

٢٠١١

تحت إشراف

الأستاذ الدكتور / عبد السلام فوزي الصاوي

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INTRODUCTION

Cephalosporins were originally introduced for treatment of penicillinase-resistant Staphylococcal infections. These drugs had the advantage that they had a similar spectrum of activity against gram-negative microorganisms. Cephalosporins in general have the advantages of beta-lactamases stability, good activity against target proteins (PBP_S) and good ability to penetrate bacterial cell wall. Although they may be active against a wide range of microorganisms, such activities are not uniform and there are subtle differences between the different molecules ***(Wise, ١٩٩٧ and Prescott, ٢٠٠٦).***

The range of cephalosporins available for use in food-producing animals is limited compared to human. A few first and second generation cephalosporins are approved worldwide strictly for treatment of mastitis in dairy cattle. A third-generation cephalosporin, ceftiofur, and a fourth-generation cephalosporin, cefquinome, have been developed strictly for veterinary use. Cefquinome has been approved in several countries for the treatment of respiratory disease in cattle and swine, foot rot and mastitis in dairy cattle. Ceftiofur has worldwide approvals for respiratory disease in swine, ruminants and horses and has also been approved for foot rot and metritis in cattle. Ceftiofur has also been approved in various countries for early chick mortality in day-old chicks and turkey poults ***(Hornish and Kotarski, ٢٠٠٢)***.

Ceftriaxone is a third-generation cephalosporin that exhibits saturable plasma protein binding, which influences its pharmacokinetic parameters depending on the dose ***(Yuk et al,. ١٩٨٩).*** Ceftriaxone is a broad-spectrum parenteral cephalosporin with potent activity against gram-positive and gram-negative bacteria ***(Neu et al., ١٩٨١)***. As compared to first and second generation cephalosporins, ceftriaxone has enhanced activities against many aerobic gram negative bacilli. Ceftriaxone showed efficacy and safety in patients with bacterial meningitis, respiratory tract, urinary tract, soft tissue, bone and joint infections, and gonorrhea ***(Richards et al., ١٩٨٤ and Nahata and Barson, ١٩٨٥).*** The major adverse reactions of ceftriaxone are gastrointestinal, dermatologic, hypersensitivity, haematologic, hepatic, and renal as well as central nervous system effects ***(Christ ١٩٩١)***.

Aim of the work:

The present study was conducted to peer into the possible adverse effects of ceftriaxone on male reproductive organs (testes, epididymis and accessory sex organs) weight, sperm motility, sperm cell count and sperm abnormalities.

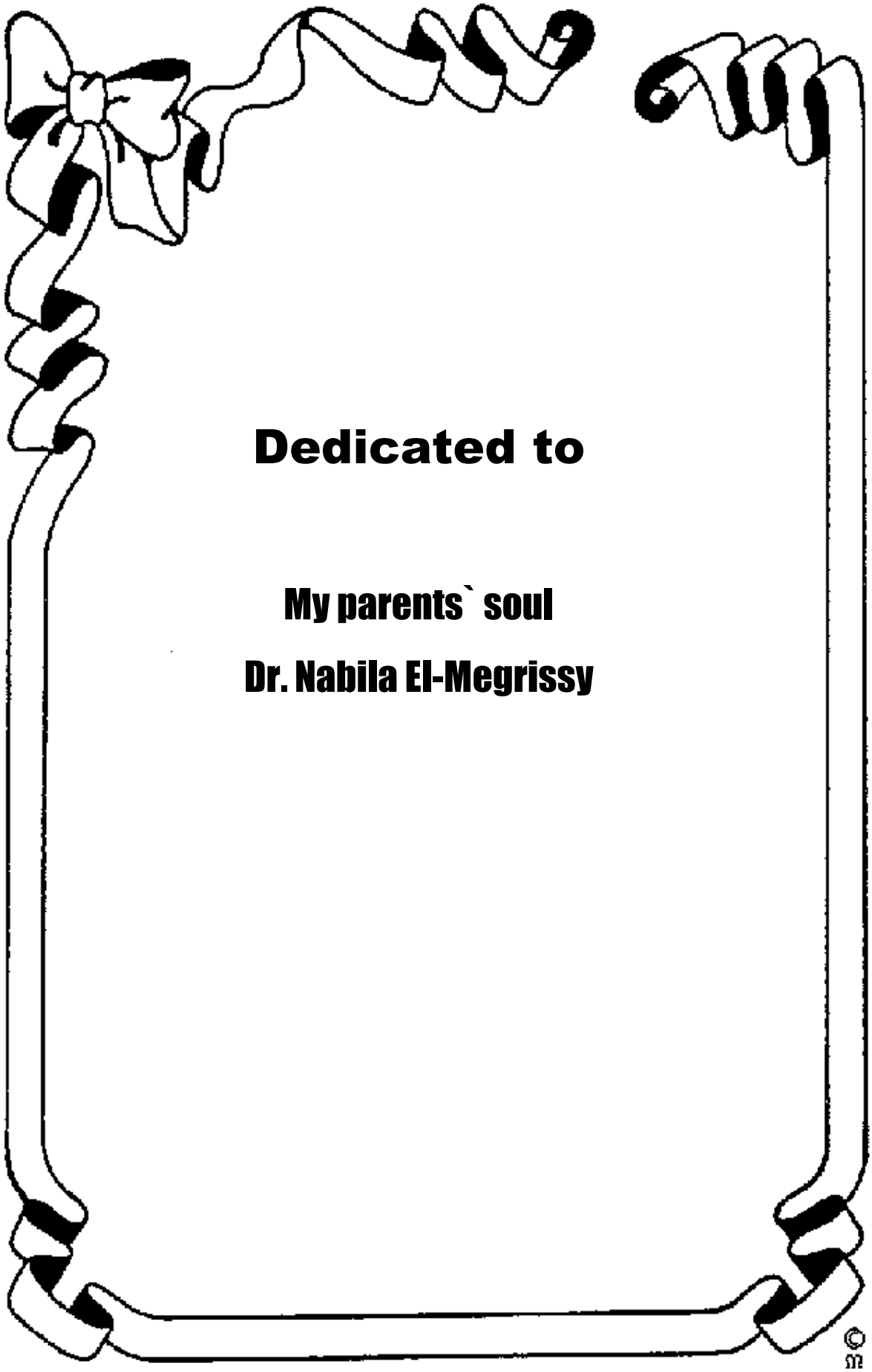
Moreover, this work was extended to determine the effect of ceftriaxone administration on haematological parameters, liver and kidney weights and functions, besides histopathological examination of male reproductive organs, liver and kidney in rats.

CONCLUSION

It could be concluded that third generation cephalosporins must not be the first choice antimicrobial agents in animals and should be reserved for use where susceptibility testing indicates that alternative are not available and for serious, life-threatening infections caused by Gram-negative bacteria.

Ceftriaxone fulfills many of the qualities of an ideal antibiotic: an extended antimicrobial spectrum, good penetration into the tissue, a prolonged elimination half-life and balanced excretion pattern. Because of documented efficacy, safety, and convenient dosing schedule, ceftriaxone has become one of the preferred third-generation cephalosporin for treatment of a variety of serious infections.

Ceftriaxone administration induced fertility troubles in the form of abnormal semen characters and decreased reproductive organs weight. Moreover ceftriaxone administration provoked some adverse effects on haematological and biochemical parameters so attention should be paid to administration of higher doses of ceftriaxone.



Dedicated to

My parents` soul

Dr. Nabila El-Megrissy