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بسم اللّه الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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قسم

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Cairo University
Faculty of Veterinary Medicine

Advanced Pharmacological Studies on the Progesterone Hormone in Mares and Cows

A thesis submitted by

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For the degree of Ph.D
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Abstract

The present study aimed to investigate the mRNA and protein expressions of nuclear progesterone (P4) receptors; PRA and PRB in mares and cows during the estrous cycle, pregnancy and parturition. RT-qPCR was used to quantify the mRNA expression for PRA and PRB and the difference between mRNA expressions for both genes was compared using the ΔΔCt method. While the Western blot technique was used to compare the protein expression, the band intensity was analyzed using Image J. The tissue P4 concentration was measured using the enzyme immunoassay (EIA). The mRNA and protein expressions for PRA were significantly higher (P<0.0001) in equine placental tissue compared to the PRB mRNA and protein expressions. The expression of PRA mRNA in the cyclic mares was higher (P<0.005) during estrus than diestrus, however, there was no difference in the expression of PRB in the two phases. On the other hand, the protein expression for both PRA and PRB was higher (P<0.005) in estrus compared to the diestrus. The endometrial P4 concentration during diestrus was lower (P<0.005) than in estrus. Both PRA and PRB mRNA (P<0.005) and protein expression (P<0.0005) in cows' myometrial tissues decreased at term compared to the pregnancy. Also, the concentration of P4 in myometrial tissue decreased (P<0.005) in cows at parturition. The expression of mRNA for both isoforms PRA and PRB was high in the early luteal phase (ELP) (P<0.05) compared to the middle and late luteal phases (MLP and LLP). The protein expression of PRB was higher (P<0.05) in ELP compared to MLP and LLP. On the other hand, the protein expression of PRA did not change between all the phases. There was a positive correlation between the PRB protein and the endometrial P4 concentration (rs=0.6164, P<0.005). The endometrial P4 concentration was higher (P<0.05) during the ELP compared to the MLP and LLP. In conclusion, the nPRs are detectable in the term placenta of mares and PRA is the dominant isoform expressed, PRA plays a crucial role in the mare parturition and expulsion of the placenta. The differential nPRs dynamics in the equine endometrium play an important role in the regulation of the estrous cycle. The parturition process in cows is accompanied by functional P4 withdrawal characterized by decreasing the expression of both nuclear P4 receptor isoforms; PRA and PRB. The action of the P4 on the endometrium during the estrous cycle is mainly attained by the PRB isoform.

Keywords: Progesterone-receptors-cows-estrous cycle-parturition-mares-placenta

Dedication

This thesis is dedicated to my parents and my wife.

For their endless love, support and encouragement.

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