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INHIBIN IN SERUM AND FETAL FLUID OF SHE- CAMEL THROUGHOUT PREGNANCY

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SUMMARY

Blood samples were collected from 40 pregnant she- camels slaughtered at Cairo abattoir. The animals were divided into three groups according to the stage of pregnancy, eraly stage up to 5 months (15 animals), middle stage from 5-9 months (13 animals) and late stage of pregnancy above 9 months (12 animals). Amniotic fluid was collected from each animal individually. Inhibin was measured in serum and amniotic fluid using indirect method. The results showed that inhibin level increaseed with the advancement of pregnancy in both serum and amniotic fluid. Moreover, the level of inhibin in amniotic fluid was higher than its corresponding serum level during the different stages of pregnancy.

INTRODUCTION

During the last decades inhibin received great attention where several studies were designed to study the relationship between inhibin and gonadotropin regulation in most species (Dejong, 1979, Franchimont et al., 1980), Franchimont et al., 1980 .Famworth et al., 1988 and Burger, 1993). Also, several studies were performed to determine its site of formation in both sexes (De jong and Sharp, 1976, Tsonis et al., 1983 and Dekretser et al., 1996). Moreover, other studies aimed to clarify its chemical nature (Robertson et al., 1985, Miyamoto et al., 1986 and Knight et al., 1989).

Recently the study of inhibin during pregnancy has some attention especially in humans (France et al., 1996, Lambert et al., 1996, Nambo et al., 1996 and Miller et al. 1997). However, such

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studies in domestic animals seem to be scare specially in she - camels. So this work aimed to give basic information about inhibin in serum and fetal fluids in different stages of pregnancy in the she-camel.

MATERIAL AND METHODS

Blood samples were collected randomly from 100 labelled she- camel slaughtered at Cairo abattoir. After evisceration blood samples of non pregnant animals were discarded and those of pregnant animals were divided into three groups according the stage of pregnancy, early (15 animals), middle (13 animals) and late stage of pregnancy (12 animals). Amniotic fluid was collected from each animal of the three groups individually using separate, clean and dry syringes.

Stage of pregnancy was determined according to the method of Crown Rump Length (C.R.M) as follow (C.R.M < 18.44±1.31 cm)<5 months for early pregnancy, (C.R.M < 18.44±1.31 to 43.87 ±0.909cm) 5 to < 9 months for middle pregnancy and (C.R.M, 43.87± 0.909 to 81.75±0.563cm) 9 to <13 months for late pregnancy (Al-Agawany and Gad, 1991). Sera and fetal fluid were kept at -20c till inhibin assay. Sera and fetal fluid were subjected to steroid extraction according to the method of Welschen et al. (1977). Inhibin potency of the steroid -free samples was estimated by indirect method throughout comparing the percentage of FSH suppression in the overiectomized rats as a result of injection of these samples with those obtained from the log - dose response curve of different doses of standard porcine inhibin (Ali, 1998). FSH was estimated using direct ELISA technique (Voller et al., 1979). Statistical analysis was perfirmed according to Snedecor (1971).

RESULTS

Data presented in table (1) showed that the higher level of inhibin potency was found during late stage of pregnancy in serum and amniotic fluid. Moreover, inhibin potency was significantly higher in amniotic fluid than its corresponding serum level throughout the different stages of pregnancy.

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Table (1): Level of inhibin potency (unit/ml) in serum and amniotic fluid of she-camel throughout pregnancy.

Stage of pregnancy	Serum	Amniotic fluid
Early stage (up to 5 months)	0.57 ± 0.02^{aA}	0.94 ± 0.02^{abA}
Middle stage (5-9 months)	0.64 ± 0.03^{bA}	1.17 ± 0.04^{aA}
Late stage (above 9 months)	0.77 ± 0.05^{abA}	1.28 ± 0.08^{bA}

± Standard error.
- Values within the same column having the same small letter are significantly different at least at ($P<0.05$).
- Values within the same row having the same capital letters are significantly different at ($P<0.001$)

DISCUSSION

In the present investigation, it was found that inhibin level in serum of pregnant she- camel increase gradually with the advancement of pregnancy. Such result comes in accordance with previous studies in other species including man (Rieley et al., 1996; Nambo et al., 1996 Noble et al., 1997. Miller et al., 1997 and Wallace et al., 1997).

It is recorded that corpus luteum is considered as a source of inhibin in some species (Davis et al., 1986; Burger et al., 1996 and Bird et al., 1997). Fetal gonads have been proved to be also a source of inhibin in most species if animals (Nambo et al., 1996 and Miller et al., 1997). Moreover, the placenta in women is also referred to as an inhibin source (Mayo et al., 1996 and Petraglia, 1997). Based on these result the increased inhibin level in serum of pregnant she camel is anticipated and may be due to all these factors or some of them.

The present results also showed that inhibin level in the amniotic fluid in pregnant she camel increased gradually with the increase in pregnancy duration. This finding comes in agreement with the results of previous studies in other species (Riley et al., 1996; Nambo et al., 1996 and Miller et al., 1997). It can be suggested that such increase in inhibin level in the amniotic fluid is due to the inhibin secretory activity of foetal gonads (Aria et al., 1997; Nambo et al., 1996 and Miller et al., 1997).

Further investigation are required to declare whether the placenta in she - camel possesses the potentiality of inhibin secretory activity. Moreover , the obtained results clarify that the levels of inhibin of amniotic fluid is higher than its corresponding levels of serum at different

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stages of pregnancy. This results comes also, in accordance with previous studies (Nambo et al., 1996; Miller et al., 1997 and Wallace et al., 1997) and it again supports the speculation that fetal gonads in camel have inhibin secretory activity.

REFERENCES

Ali K.M., (1998): Studies on in inhibin hormone in She-camel. Ph.D. thesis Fac. Vet. Med. Beni-Suef, Cairo Univ.

Arai K. Komura H. Akikusa T. and Iio K. (1970): Contributions of endogenous inhibin and estradiol to the regulation of follicle stimulating hormone and luteinizing hormone secretion in the pregnant rat. Biol. Reprod. 56 (6): 1482-9.

Birdsall M. Ledger W. groome N.Abdalla H. and Muttakrishna S. (1997): Inhibin A and activin A in the first trimester + of human pregnancy. J. Clin. Endocr. Metab. 82 (5): 1557-60.

Burger H.G. (1993): Clinical review 46: Clinical utility of inhibin measurements. J. Clin Endocr. Metab. 76: 1391-96.

Burger H., hee J. Bnngch, M. and Prince M. (1996): Effects of FSH on serum immunoreactive inhibin levels in the luteal phase of the menstural cycle. Clin. Endocr. 45 (4): 431-4.

Davis S.R. Dench F. Nikolaidis I. and Clements J.A. (1986): Inhibin A- subunit gene expression in the ovaries of immature female rats stimulated by pregnant mare serum gonadotropin. Biochem. Biophys Commum, 138: 1191-1195.

Dekretser D.M. and McFarlane J.R. (1996): Inhibin the male (review) J. Androl. 17 (3): 179-82.

DeJong F.H. (1979): Inhibin-fact or artifact. Mol. cell Endocr. 13:1-10.

El-Agawany A.A.A. and Gad M.R.A. (1991): Prenatal growth in the dromedary (Camelus Dromedarus). Beni-Suef Vet. Med. Res.1 (2).

DeJong F.H. and Sharp R. (1976): Evidenc for inhibin -like activity in bovine follicular fluid . Nature. 163:71-72.

Famworth P., Roberston D., Dekretser D. and Burger H. (1988): Effects of 31 kDa bovine inhibin on FSH and LH in rat-pituitary cells in vivo : antagonism of goinadotropin-releasing hormone agonstics. J. Endocr. 119: 233-241.

France J.T., Keelan J., Song L.Liddell H., Zanderigo A and Knox B (1996): Serum concentrations of human chorionic gonadotrophin and immunoreavtive inhibin in early pregnancy and recurrent miscrriage : a longitudinal study . Aust and New Zealand J. Obestetrics and Gynaecol. 36 (3): 325-30.

Franchimont P., Deoulin A., Proyard V., Hagelstein M. and Boarguignon (1980): Inhibin: new gonadal hormone . Annals _Endocr. (paris). 41: 3-19.

Knight P.G. Beard A.J., Wrathall J.H. and Castillo R.J. (1989): Evidence that the bovine ovary secretes large amounts of monomeric alpha subunits and its isolation from bovine follicular fluid. J. Mol. Endocr. 2: 189-200.

Lambert- Messerlian G.M., Canick J.A., Palomaki G.E. and Schneyer A.L. (1996): Second trimester levels of matrnal serum inhibin A, total inhibin, alpha inhibin precursor and activin in down,s syndrome pregnancy. J. of Medical Screening. 3 92): 58-62.

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Mayo K.E., Cerelli G.M and speciess J. (1986): Inhibin alpha subunit cDNAs from porcine ovary and human placenta. Proc. ~Natl. Acad. Sci. USA. 83: 5849-5853.

Miller S. Wongprasartsuk S., Young I.R. and wlodek M.E. (1997): Source of inhibin in ovine fetal plasma and amniotic fluid during late gestation: half-life of fetal inhibin. Biol. Reprod. 57 (2) 347-53.

Miyamoto K., Hasegwa Y., Fukuda M. and Igarashi M. (1986): Demonstration of molecular weight forms of inhibin in bovine follicular fluid (bff) by using monoclonal antibodies to bff 32k inhibin. Biochem. Biophys. Res. commum. 136: 1103-1109.

Nambo Y., Nagata S., Oikawa M. and Yoshihara T. (1996): High concentrations of immunoreactive inhibin in the plasma of mares and fetal gonads during second half of pregnancy. Reprod. Fertil. Dev.8 (8): 1136-45.

Nobl P.L., Wallace E.M., Snijders R.J. groome N.P. Nicolaodes K.H. (1997): Maternal serum inhibin -A and free beta HCg connecentrations in trisomy pregnancies at 10 to 14 weeks of gestation. Br. J. Obstet. Gynaecol. 10493): 367-71.

Petraglia F. (1997): Inhibin, active and follistatin in the human placenta a new family of regulation proteins, (Reciew). Placenta. 1-18 (1) 3-8.

Riley S.C., Wathen N.C., Chard., Groome N.P.E.M. and Wallace ~E.M. (1996): Inhibin in extra-embryonic coelomic and amniotic fluids and maternal serum in early pregnancy. Hum. Reprod. 11 (12): 21772-6.

Robertson D.M., Foulds L.M., Leversha L and Morgan F.J. (1985): Isolation of inhibin from bovine follicular fluid. Biochem. Bopphys. Res. Commum, 126: 220-226.

Snedecor (1971): Statistical Methods. 4th Ed, Iowa, State, Univ. Press. Iowa.

Tsonis C.G., Quigg H., Lee V.W. and Levershs L. (1983): Inhibin in individual ovine follicles in relation to diameter and atresia J. Reprod. Fert., 67; 83-90.

Voller, M., Bidwell ~D.E. and Bartlett A. (1979): The Enzyme Linked Immunosorbent Assay (ELISA). The Zoological Society, London, pp 16-17.

Welschen R., Hermans W.P., Dullaart J. and De Jong F.H. (1977): Effects of an inhibin-like factor present in bovine and porcine follicular fluid on gonadotrophin levels in ovariectomized rats. J. Reprod. Fert., 50: 129-131.

Wallace E.M., Riley S.C. Crosseley J.A. Ritoe S.C. and Horne A. (1997): Dimeric inhibins in amniotic fluid, maternal serum and fetal serum in human pregnancy. J. Clin. Endocr. Metab. 82 (1): 218-22.

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