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Study on Biochemical Compositions of Follicular Fluid in Local Iraqi Ewes in Relation with Different Follicles Size

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ABSTRACT

This study was performed on 322 ovaries (161 slaughter Iraqi ewes) in Al-Kut and Al-Shulla abattoirs during period from November 2015 to May 2016 , their age are range from 3-6 years. Ovaries contain three categories of follicles size divided into small (<2 mm) , medium (2-4 mm) and large (>4 mm). Follicular fluid aspirated by medical syringe and dis-tributed in three tubes (each tube represented one size of follicle). Ana-lyzed metabolites (glucose, total protein , cholesterol , urea and creati-nine) and hormones (estradiol, progesterone and testosterone). The re-sults showed significantly differences ($p < 0.05$) related with total pro-tein and urea in large follicle (LF) compared with small follicle (SF) and medium follicle (MF) but recorded sig. differences between glucose, cholesterol, related to MF and LF compared with SF (glucose and choles-terol decreased in SF) , while the creatinine recorded sig. differences ($p < 0.05$) related to LF compared with SF and MF , but hormones concen-tration was recorded sig. differences ($p < 0.05$) related to estradiol and progesterone in MF and LF compared with SF , while testosterone hor-mone recorded no sig. differences between different classes of follicles . In concluded that they recorded changes in biochemical compositions (metabolites and hormones) related with size of follicles.

KEYWORDS Iraqi ewes , Follicular fluid , Metabolites , Hormones

Introduction.

Follicular fluid (FF) is in part transudate of serum and also partially composed of locally produced substances , which are related to the metabolic activity of the follicular cells (1 and 2) . Follicular fluid composition has been under intensive investigation in recent times in a bid to increase knowledge of follicular development, oocyte maturation and follicular atresia (3 and 4) . The composition of FF varies with the cyclical hormonal changes and developmental stages of follicle . The theca cell convert cholesterol into testosterone under LH influence , which later gets converted to estradiol 17- B in granulosa cells under the effect of FSH (5 and 6). Although biochemical profiles in cattle by Wise (7) buffalo (8), goat (4) and pig (9) are available , the information on biochemical analysis of follicular fluid of ewe is ill defined , also no reports are available on hormonal and biochemical profile of follicular of unovulated follicles in superovulated ewes (6). The purpose of this study to investigate the relation between the biochemical changes in follicular fluid with different follicles size in local Iraqi ewes .

Materials and methods.

This study was performed on 322 ovaries (161 slaughter Iraqi ewes) in Al-Kut and Al-Shulla abattoirs during period from November 2015 to May 2016 , their age are range from 3-6 years. We collected 196 ovaries have different structure's mainly follicle and C.L and the follicles was divided into three categories small (<2 mm) , medium (2-4 mm) and large(>4 mm). The ovaries were removed from association with ovarian ligaments in the genital tract, and cleaned from suspended tissues, and washed with a chilled normal physiological saline (0.9% NaCl) then dry by filter paper. The follicular fluid was aspirated by sterilized medical syringes with volumes 1 ml and a needle with a measurement of 310 × 3\8 (0.25×9.5mm) and the follicular fluid which collected from three different categories was distributed in three tubes (one tube represented one size follicles). All tubes placed in centrifugation at 4°C at 5000 round / minute for 30 min according to Maniwa ***et al***, (10). They analyzed metabolites including glucose, total protein , cholesterol , urea and creatinine by using special kits in Spectrophotometer-PD303-Germany. While analysis three hormones include estradiol, progesterone and testosterone by using the device ELISA (Metertch- Germany). The Statistical analysis included mean, stander error, Chi-Square and Student test (F-test) according to (11)

Results and discussion.

The results showed in table -1- that they recorded highly significantly ($p < 0.05$) related with total protein and urea in large follicle (LF) compared with small follicle (SF) and medium follicle (MF) due to equilibrium existed between plasma and follicular fluid and permeability through the blood follicular barrier (2, 3, 12) but recorded sig. differences between glucose, cholesterol, related to MF and LF compared with SF (glucose and cholesterol decreased in SF) these result was agree with many authors (2 and 12), while the creatinine recorded sig. differences ($p < 0.05$) related to LF compared with SF and MF, these finding agreement with Singh et al (3) and Anderson et al (13), while the hormones concentration changes between different size of follicles were recorded higher sig. differences ($p < 0.05$) related with estradiol and progesterone in large follicle and medium compared with small follicle due to convert of cholesterol to estradiol as well as granulosa cells secreted estradiol also (5, 6). But progesterone was increased due to important role for development of oocyte and follicle (14), the testosterone hormone was stable due to not present of atritic follicle (6). We concluded from this study that they changes in biochemical compositions (metabolites and hormones) in follicular fluid related with different follicles .

Table-1- Metabolites of follicular fluid in different size of follicles in Iraqi ewes.

Composition (Metabolites)	Small Follicles M ± SE	Medium Follicles M ± SE	Large Follicles M ± SE	Overall M ± SE
Total protein (g /dL)	6.43± 0.09[a]	5.97± 0.13[b]	5.83± 0.08[b]	6.07 ± 0.1
Urea (mM)	4.76± 0.14[a]	4.31± 0.09[b]	4.16± 0.11[b]	4.41 ± 0.11

Glucose (mM)	1.13± 0.10[a]	1.76± 0.17[b]	1.93 ± 0.16[c]	1.60 ± 0.11
Cholesterol (mM)	1.54± 0.17[a]	1.93± 0.36[b]	2.67 ± 0.32[c]	2.04 ± 0.28
Creatinine (mM)	0.18±0.02[a]	0.20± 0.03[a]	0.23 ± 0.01[b]	0.20 ± 0.02

Different letter mean sig. differences $p < 0.05$.

Table-2- Hormones of follicular fluid in different size of follicles in Iraqi ewes.

Hormones	Small Follicles M ± SE	Medium Follicles M ± SE	Large Follicles M ± SE	Overall M ± SE
Estradiol (ng/ml)	132.6±11.42[a]	161.9±9.46[b]	178.8±10.35[c]	157.76±10.41
Progesterone (pg/ml)	223.5±17.56[a]	276.7±16.91[b]	342.7±36.52[c]	280.96±24.33
Testosterone (pg/ml)	189.7±6.27[a]	194.4±13.12[a]	196.8±7.13[a]	193.63±8.84

Different letter mean sig. differences $p < 0.05$.

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