

Pathologic Studies On Ovarian Abnormalities In Nagas (Camelus Dromedarius) In Al –Ahsa, Saudi Arabia

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Abstract:

The present study was conducted to assess the type and prevalence of ovarian abnormalities in nagas slaughtered at Al-Ahsa slaughterhouse or admitted to necropsy theatre at College of Veterinary Medicine and Animal Resources (King Faisal University). The ovaries of (n=600) non pregnant nagas were collected and examined. The abnormalities were recorded in 61 nagas (10.16%). The average incidence of various conditions encountered in order of frequency was: follicular cysts (3.83%), luteal cysts (2.16%), infundibular cysts (1.33%), haemorrhagic cysts (1.33%), ovario-bursal adhesions (0.5%), para-ovarian cysts (0.5%), oophoritis (0.17%), teratoma (0.17%) and ovarian adenoma (0.17%).

The study clarified that the follicular, luteal cysts, infundibular cysts and haemorrhagic cysts were the most common ovarian abnormalities in nagas in Al-Ahsa province, Saudi Arabia. These abnormalities seem to play a role on ovarian dysfunction.

Key Words: Dromedary camel, nagas, ovary, ovarian cysts, Saudi Arabia.

Introduction:

Camelids are important animals production resource in many areas of the world. The reproductive efficiency of camelidae, particularly dromedary camels, is generally considered low (Kaufmann, 2005).

Pathological examination of the ovaries provides definite information more accurately than that obtained by clinical or other paraclinical examinations. Ovarian agenesis and hypoplasia were recorded in ruminants, swine and dogs. In bilateral agenesis the tubular genitalia may be absent or underdeveloped (Kennedy and Miller, 1993). Ovarian agenesis and hypoplasia were also recorded in camels (Dafalla *et al.*, 1991).

Cystic ovarian disease (COD) is an important ovarian dysfunction and a major cause of reproductive failure in dairy cattle. It is generally accepted that disruption of the hypothalamo-pituitary-gonadal axis by endogenous and/or exogenous factors, causes cyst formation (Vanholder *et al.*, 2006). The incidence of cystic and inactive ovaries among female camels in Saudi Arabia has been found to increase in summer (Hegazy *et al.*, 2001).

Para-ovarian cysts have been recorded in camels in Egypt (Shalaby, 1986). Several workers reported those cysts in mares, buffaloes, cows and pigs (Svend *et al.*, 1976, Viswanath *et al.*, 1979 and Khan, 1991).

Ovario-bursal adhesions have been recorded in camels (Abd El wahab, 1991), buffaloes (Potekar *et al.*, 1982), sheep (El-wishy *et al.*, 1974) and goats (Kadu and Kaikini, 1988). Hydrobursitis has been recorded in camels (Omar *et al.*, 1984).

Oophoritis has been recorded in camels (Abd El-wahab, 1991) and in domestic animals (Jubb *et al.*, 1993).

Teratomas have been recorded in camels (Abd El-wahab, 1991). Ovarian tumors like, dysgerminoma, arrenoblastoma, papillary adenoma and fibroma have been recorded in camels (El-Khouly *et al.*, 1991). Such tumours have been also recorded in cat, saw, mare and goats (Dehner *et al.*, 1970, Svend *et al.*, 1976).

The objective of the present study was to shed light on the incidence of common ovarian abnormalities in nagas in Al-Ahsa province, Saudi Arabia.

Materials and Methods:

1. Animals:

The genital tracts of non-pregnant nagas (n=600) were collected from slaughterhouse at Al-Ahsa province or admitted to necropsy at College Of Veterinary Medicine and Animal Resources (King Faisal University) from January 2009 to December 2009. The ovarian tissues were collected and examined for abnormalities.

2. Histopathologic Technique:

The ovarian abnormalities were fixed in 10 % neutral buffered formalin. The formalin-fixed tissue were dehydrated, processed and embedded in paraffin blocks. Sections of 4-5 μm thickness were cut and routinely stained with hematoxylin and eosin (HE) according to Bancroft *et al.* (1996).

3. Statistical Analysis:

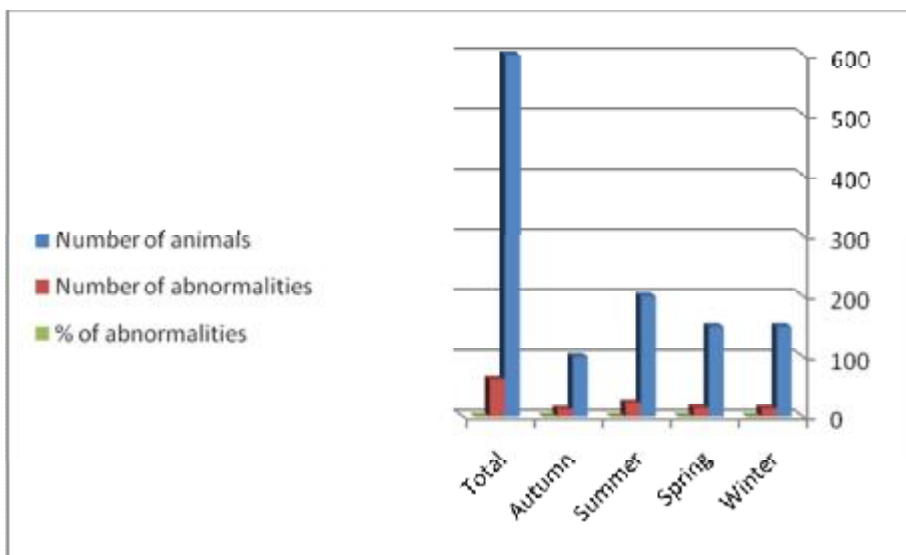
The seasonal incidence of ovarian abnormalities was recorded and compared using " χ^2 " (Snedecor and Cochran, 1989).

Results:

The ovarian abnormalities were recorded in 61 out of (n=600) non pregnant nagas (10.16%). There was no effect of season on the incidence of ovarian abnormalities (table 1 and graph 1).

Table 1
Seasonal incidence of ovarian abnormalities in nagas

Ovarian abnormalities	Total	Season			
		Winter	Summer	Spring	Autumn
Follicular cysts	23	6	7	4	6
Luteal cysts	13	3	5	3	2
Haemorrhagic cysts	8	2	3	2	1
Para-ovarian cysts	3	-	2	1	-
Ovarian-bursal adhesions	3	-	2	-	1
Infundibular cysts	8	1	3	3	1
Oophoritis	1	-	-	-	1
Teratoma	1	1	-	-	-
Ovarian adenoma	1	-	1	-	-
Total	61/600	13/150	23/200	13/150	12/100



Graph (1) Seasonal incidence of ovarian abnormalities in nagas
 χ^2 value = 1.205 at d.f = 3 non significant ($p > 0.05$).

Histopathologic Findings:

1- Follicular Cysts:

It was observed in 23 case (3.83%). The cysts were thin walled and the wall was either semitransparent and well vascularized or slightly opaque with little vascularization (fig.1). Most of the cysts were a spherical mass bulging from the surface of the ovary and occupying a small part of ovarian cortex. The thin walled cysts were filled with a straw coloured serous fluid. When multiple cysts were present in one ovary, they took a grape like appearance.

Histologically, the ovum and the surrounding cells were completely degenerated or absent. The granulosa cells were 1-3 layers or completely degenerated in most cases (fig.2). The basement membrane was not found in most cases and it was difficult to differentiate the theca interna from the theca externa.

2- Luteal Cysts:

It was observed in 13 case (2.16%). The cysts were thick walled and became opaque with meaty like consistency and grayish yellow in colour (fig.3).

Histologically, the granulosa cells suffered from vaculization and luteinization forming granulosa lutein cells which appeared polyhedral with large vesicular nuclei and vacular cytoplasm (fig.4). The cysts were surrounded by a fibrous connective capsule.

3- Haemorrhagic Cysts:

It was observed in 8 cases (1.33%). The cysts had a thick highly vascular wall similar to haematoma (fig.5). In cut section, brownish material occupied the antral cavity.

Histologically, the antral fluid occupied by a large amount of haemorrhage. The granulosa and theca interna cells appeared hypertrophied and vaculated. The cyst wall was composed of a thick connective tissue capsule.

4- Para-Ovarian Cysts:

It was observed in 3 cases (0.5%). The cysts were fluctuating, spherical, oval or irregular. They contained a clear yellowish serous fluid and were either attached to the mesovarian ligament or the mesosalpinx. Their widest diameters varied from 1 to 6 cm and their walls were commonly thin and transparent (fig.6).

Histologically, the cysts were lined with one layer of cuboidal or flattened epithelial cells, surrounded by a thin layer of connective tissue.

5- Ovario-Bursal Adhesions:

It was observed in 3 cases (0.5%). The ovary adhered firmly to the bursa and surrounded by a thick layer of connective tissue (fig.7). The site of adhesions consisted of fibrous bands and also involved the corresponding Fallopian tube. There was a locally extensive peritonitis with many fibrous threads between the outer surface of the uterus, broad ligaments and the surrounding structures.

6- Infundibular Cysts:

It was observed in 8 cases (1.33%). In most cases, the ovarian bursa was greatly enlarged and contained about 200-250 ml of slightly yellowish serous fluid. Its wall was thin, flabby and semitransparent. In one case the ovarian bursa had a thick dark wall and contained blood tinged fluid (fig.8). In few cases, the ovarian bursa was smaller in size and distended with about 3 ml of clear serous fluid and accompanied by ovario-bursal adhesions.

Histologically, the wall of the bursa showed proliferation of the lining epithelium to 2 or 3 layers of cells, under which there was a thick layer of wavy bundles of collagen fibres with many dilated capillaries and infiltrated by a few lymphocytes. Many finger like projections extending from the lining wall into the lumen of bursa were also seen.

7- Oophoritis:

It was observed in one case (0.17%). The ovary was discoloured. Histologically, the ovarian medulla was congested and infiltrated by neutrophils, macrophages and lymphocytes, and the ovarian cortex revealed antral and atretic follicles.

8- Benign Mature Cystic Teratoma (Dermoid Cyst):

It was observed in one case (0.17%). It consisted of a fibrous wall surrounding a cavity filled with hair and viscous material (fig.9). Histologically, the cavity of the teratoma lined by keratinized squamous epithelium, under which there was a fibrous connective tissue containing hair follicles, sweat and sebaceous glands (fig.10).

9- Ovarian Adenoma:

It was observed in one case (0.17%). It was firm, spherical and lobulated. On cut section, a serous fluid oozed and variable sized cysts were separated by grayish-white septa (fig.11). Histologically, the ovary was made up of

different sized spaces, contained serous eosinophilic fluid, lined by low cuboidal cells (fig.12).



Fig.1: Ovary showing thin, semitransparent and well vascular follicular cyst (arrow)

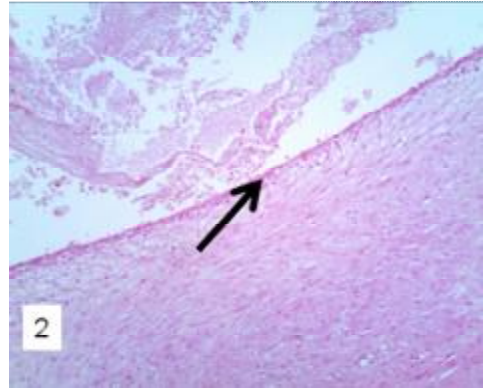


Fig.2: Follicular cyst showing one cell layer of the granulosa cells. H&E X400

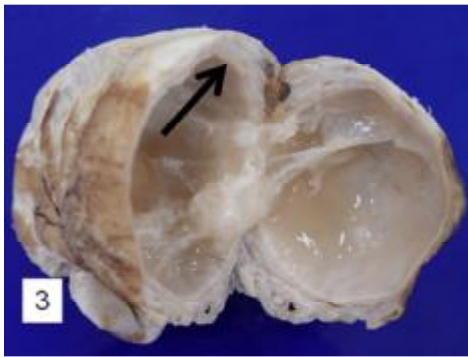


Fig.3: Luteal cyst showing thick wall with meaty like consistency

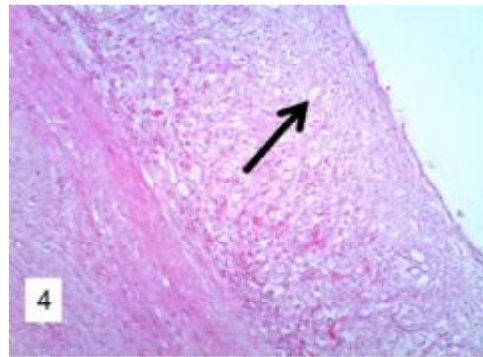


Fig.4: Luteal cyst showing multi-layers of lutein granulosa cells suffering from vacuolization (arrow). H&E X400

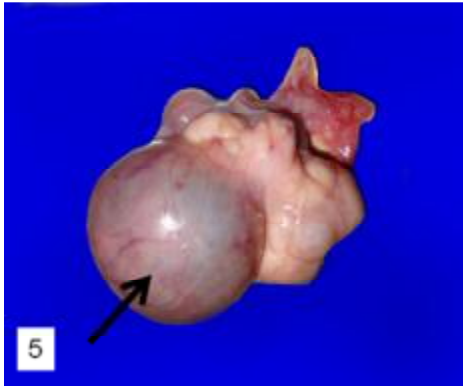


Fig.5: Ovary showing haemorrhagic cyst with a thick highly vascular wall (arrow)



Fig.6: Paraovarian cyst (arrow) showing a thin transparent wall



Fig.7: Ovario-bursal adhesions: Note, the firm adherence between ovary, ovarian bursa and fallopian tube (arrow)



Fig.8: Ovary showing infundibular cyst with a thick dark wall containing blood tinged fluid (arrow)

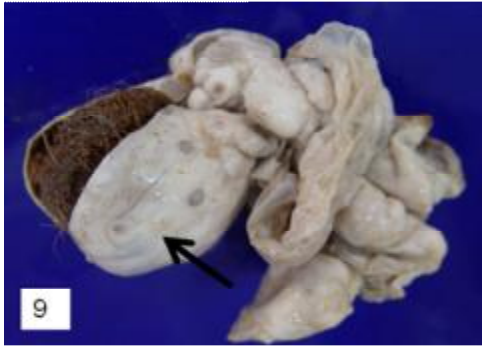


Fig. 9: Teratoma (cross section) showing a mass of hair and viscous material (arrow)

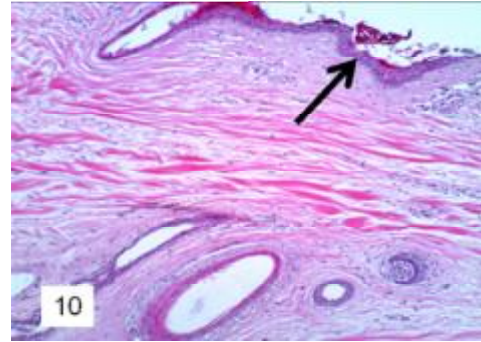


Fig.10:Teratoma showing stratified squamous epithelium (arrow), hair follicles and sweat glands. H&E X400



Fig.11: Ovarian adenoma (cut surface) : Note, variable sized cysts separating by grayish- white septa (arrow)

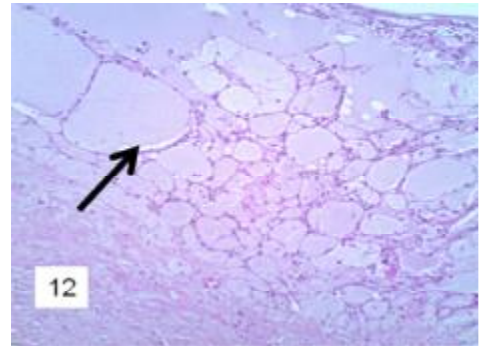


Fig.12: Ovarian adenoma showing variable spaces filled with eosinophilic material and lined by low cuboidal cells (arrow). H&E X400

Discussion:

In the present study, there is no effect of the season on different ovarian abnormalities in nagas in Al-Ahsa, Saudi Arabia.

Follicular, luteal and haemorrhagic cysts are a normal evolution of the non ovulatory follicle (functional cysts). The presence of these cysts indicates ovulation failure which may be caused by inadequate LH release in response to copulation (Skidmore *et al.*, 1995). This lack or insufficient LH release could be due to a hypothalamo-pituitary function disturbance or to a reduce stimulatory effect of copulation. However, in Bacterian camel, some males have low fertility because they tend to achieve lower ovulation rates than others due to a reduced concentration of a GnRH-like factor in semen (Zhao *et al.*, 1994).

Haemorrhagic cysts may persist for several weeks and develop enough luteal tissue to produce progesterone (Tibary and Anouassi, 1997). This finding was concomitant with Nourani and Khodakaram (2004).

Moreover, El Wishy (1990) attributed the presence of haemorrhage due to hormonal disturbance.

Ovario-bursal adhesions can result from haemorrhage due to harsh manipulation of the ovaries or attempts to rupture anovulatory haemorrhagic follicles or also may be result from oophritis and result in ovarian hydrobursitis and peritonitis (Tibary and Anouassi, 2001).

Infundibular cysts were a peculiar affection of the cranial part of the infundibular wall of uterine tube characterised by the accumulation of variable amount of clear or haemorrhagic fluid. The etiopathogenesis of this condition is not well understood, but could be due to certain type of toxins (Ali *et al.*, 1992).

Para-ovarian cysts are suspected to arise from persistent embryonal structures which are vestiges of Wolfian ducts. Alam (1984) has clarified that the paraovarian in cows do not interfere with reproductive performance until compression of the lumen of the oviduct occurs.

Teratoma was of a dermoid cyst type which had one or two germ layers and consisted of cystic structure lined by keratinized stratified squamous cells and containing hair follicles, sweat and sebaceous glands. This finding was in harmony with Mesbah *et al.* (2002) in camel. It is benign and do not seem to have any effect on follicular activity on the contralateral ovary.

Oophoritis may be due to harsh manipulation of the ovaries in attempts to rupture anovulatory haemorrhagic follicles or due to ascending infections from uterus or arise from specific disease such as tuberculosis, brucellosis and campylobacteriosis (Tibary and Anouassi, 1997).

Ovarian adenoma was observed in one case (0.17%). The macroscopic and microscopic findings were in agreement with those of Nourani and Khodakaram in camels (2004).

In conclusion, The study clarified that the follicular, luteal cysts, haemorrhagic cysts and infundibular cysts were the most common ovarian abnormalities in nags in the Al-Ahsa province. These abnormalities seem to be important infertility problem.

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دراسات مرضية على إصابات المبيض فى النوق (وحيدة السنم) فى محافظة الأحساء، المملكة العربية السعودية

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الملخص العريى:

هذه الدراسة أجريت على 600 ناقة (وحيدة السنم) وذلك لمعرفة الإصابات المختلفة بالمبيض. بعض هذه النوق ذبح فى المسالخ والبعض الآخر تم تشريحه بقسم الأمراض، كلية الطب البيطرى والثروة الحيوانية، جامعة الملك فيصل. بلغ أجمالى الإصابات التى تم حصرها 61 بنسبة 10,16%. وقد تم ترتيب هذه الإصابات تنازليا كالتالى: حويصلات متكيسة غير مصفرة 3,83%، حويصلات متكيسة مصفرة 2,16%، كيسات القمع 1,33%، حويصلات دموية 1.33%، إلتصاقات بين المبيض وكيس المبيض 0,5%، تكيسات جانب المبيض 0,5%، إلتهاب المبيض 0,17%، 0التيراتوما 0,17%، ورم غدى حميد بالمبيض 0,17%. هذه الدراسة أظهرت أن الحويصلات المتكيسة الغير مصفرة والحويصلات المتكيسة المصفرة والتكيسات المائية والحويصلات الدموية هى الأكثر شيوعا بين الإصابات فى النوق بمحافظة الأحساء (المملكة العربية السعودية) وان هذه الإصابات تلعب دورا اساسيا فى التأثير على وظائف المبيض.