Journal of Veterinary Science & Technology

Dawod, J Vet Sci Technol 2018, 9:5
DOI: 10.4172/2157-7579.1000562

Research Article Open Access

Ovarian Reproductive Affections in She-Camels

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Received date: September 09, 2018; **Accepted date:** September 19, 2018; **Published date:** September 28, 2018

Abstract

The study was conducted to investigate the effect of the reproductive season on the different ovarian affections as well as the incidences of these affections in dromedary camel (Camelus dromedarius) after slaughtering. The ovaries of non-pregnant females (n=500) were collected with unknown breeding history during breeding and non-breeding season and examined grossly and ovarian follicle's diameter was measured. The abnormalities were recorded in 35 ovaries (7%). The ovarian affection was follicular cysts (3%), luteinized cysts (1%), hemorrhagic cysts (1%), organized cysts with fibrin clotting (0.8%), ovarian agenesis (0.8%) and ovarian hypoplasia (0.4%). There was no effect of season on the incidence of ovarian affections.

The study revealed that the breeding season played no role on the incidences of different ovarian affections. Also, the study revealed that the follicular, luteal and hemorrhagic cysts were the most common ovarian affections and these affections seem to play a role on ovarian dysfunction, reproductive performance and infertility in dromedary camel.

Keywords: Dromedary camel; Ovary; Ovarian cysts; Infertility

Introduction

Reproductive efficiency in the female dromedary is low when compared with other domesticated species. This is due to delay in the onset of puberty, increased age at first conception and first calving and long interval between births [1,2]. Despite the benefits of camels regarding their meat and milk, camel production is still not undertaken on a commercial scale [3]. Pathological examination of the ovaries provides definite information more accurately than that obtained by clinical examinations. Anatomical abnormalities and pathological processes of female reproductive tract have also been reported as the main causes of infertility [4]. 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 [5]. The evolution of the dominant follicle in the absence of mating presents two possible outcomes: regression or cystic degeneration in the form of an ovulatory follicle [6-8]. The incidence of cystic and inactive ovaries among female camels has been found to increase in summer [9]. Follicular, luteal cysts, infundibular cysts and hemorrhagic cysts were the most common ovarian abnormalities and these abnormalities seem to play a role on ovarian dysfunction [10]. Ovarian agenesis was recorded in camels [11]. Ovarian hypoplasia characterized by absence of ovarian follicular activity due to genital and chromosomal abnormalities [12]. The concurrent work aimed to investigate the incidence of common ovarian abnormalities in she-camels in either breeding or non-breeding season.

Materials and Methods

This study was assessed and agreed by the Animal Care and Welfare Committee Ethics, Sadat City University, Egypt. During studying 500 dromedary camel ovaries of non-pregnant animals (n=500) were collected from El-Bassatein slaughterhouse in Cairo and Nahia slaughterhouse in Giza during the breeding season (December to April) and the non-breeding season (June to October) during the period from 2015-2016.The reproductive history of the slaughtered animals was unknown. The ovarian tissues were collected after slaughtering and examined grossly for abnormalities. Ovarian follicle's diameter was measured and follicular fluid was aspirated.

Statistical Analysis

The data of different ovarian affections in and out the breeding season of the dromedary camels were collected and enrolled into the statistical analysis using SPSS software [13]. Fisher's exact test according to Snedecor et al. [14] was used to detect the reproductive season (breeding and non-breeding seasons) differences in the incidence of different ovarian affections in dromedary camels.

Results

Ovarian affections considered as the major reproductive defects caused infertility in dromedary camels. These important aspects were studied over our research paper which revealed that out of (500) ovarian samples, 35 (7%) of them were affected with different forms of ovarian affections. Moreover, the results evident that (5.33%) of these affections occurred during breeding season while (9.50%) occurred during non-breeding season (Table 1). Furthermore, either breeding or non-breeding season possessed no significant differences on the

incidences of different forms of ovarian affections in dromedary camels at ($p \leq 0.05$) (Table 2).

Season	total	Ovarian affection													
		Follicular cysts		Luteal cysts		Hemorrhagic cysts		Organized cysts with fibrin clotting		Ovarian agenesis		ovarian hypoplasia		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Breeding	300	6	2	2	0.67	2	0.67	2	0.67	2	0.67	2	0.67	16	5.33
Non-breeding	200	9	4.5	3	1.5	3	1.5	2	1	2	1	0	0	19	9.50
Total	500	15	3	5	1	5	1	4	0.80	4	0.80	2	0.40	35	7.00

Table 1: Ratios and percentages of seasonal incidence of ovarian affection in she-camels.

season	total	Ovarian affection											
		Follicular cysts		Luteal cysts		Hemorrhagic cysts		Organized cysts with fibrin clotting		Ovarian agenesis		ovarian hypoplasia	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Breeding	300	6	2	2	0.67	2	0.67	2	0.67	2	0.67	2	0.67
Non-breeding	200	9	4.5	3	1.5	3	1.5	2	1	2	1	0	0
Chi-square x^2 =		2.58		0.84		0.84		0.17		0.17		1.34	
Significance		NS		NS		NS		NS		NS		NS	
Prevalence of error		P ≤ 0.05		P ≤ 0.05		P ≤ 0.05		P ≤ 0.05		P ≤ 0.05		P ≤ 0.05	

Table 2: Effect of season on incidence of ovarian affections in she-camel, NS=non-significant at $p \leq 0.05$.

Follicular cysts

Follicular cysts represent (3%) unilateral or bilateral either single or multiple cysts but mostly in a single manner (Figure 1). The cysts were thin walled, well vascularized or slightly opaque and filled with a straw colored serous fluid. The diameter ranged from 17-40 mm.

Luteal cysts

Luteal cysts represent (1%). The cysts were thick walled and became partially or totally opaque, tense in consistency with grayish yellow in color. The follicular fluids reach 22 ml after aspiration (Figure 2). The size of cyst can reach 50 mm in diameter.

Hemorrhagic cysts

Hemorrhagic Cysts represent (1%). The cyst was single, thick wall, unilateral or bilateral and contains bloody follicular fluid reach 8 ml after aspiration (Figure 3). The diameter ranged from 10-25 mm.

Organized cyst with fibrin clotting

Organized cysts with fibrin clotting represent (0.8%). The cysts were large, thick wall and contain white or yellowish fluid like soup or organized clot like cheesy material appear after incision (Figure 4). The size of cyst can reach 50 mm in diameter with darkened surface.

Ovarian agenesis

Ovarian agenesis represents (0.8%). This condition was unilateral or bilateral. Unilateral characterized by the right ovary had a large bulging follicle but the left one have small fatty mass (Figure 5). Bilateral characterized by fallopian tube ended up in a well-developed bursa that contained a small fatty tissue mass like the size of pea and the rest of genital tract was normal.

Ovarian hypoplasia

Ovarian hypoplasia represents (0.4%). the ovaries were in the form of small, thin and firm structure without any small follicles and measured (10 mm x 5 mm and 8 mm x 5 mm in length x breadth) for left and right ovary, respectively and the rest of genital tract was normal (Figure 6).

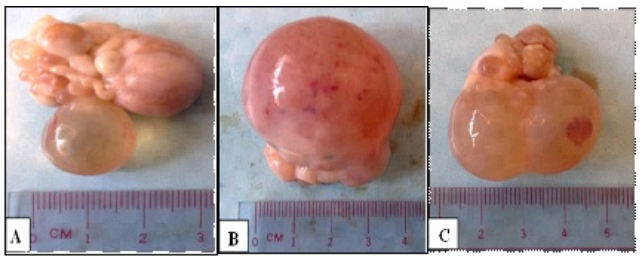

Figure 1: Ovary containing Follicular cyst characterized by large, thin wall contain serous clear follicular fluid (A) single small cyst (B) large cyst 40 mm in diameter (C) double cyst.

Figure 2: Ovary containing large luteal cyst characterized by thick walled contain serous clear follicular fluid (A) double cyst (B) large cyst 50 mm in diameter (C) 22 ml follicular fluid after aspiration from luteinized cyst.

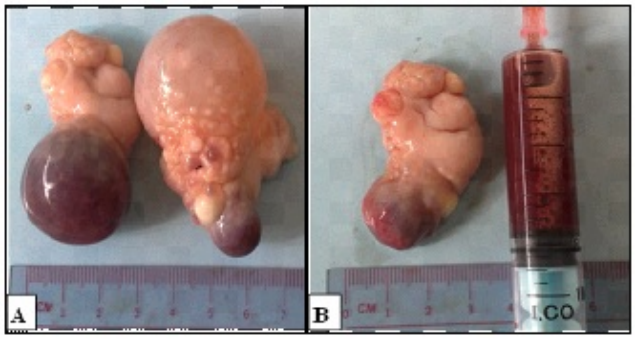

Figure 3: Haemorrhagic cyst (A) bilateral bloody follicles (B) 8 ml blood after aspiration from bloody follicle.

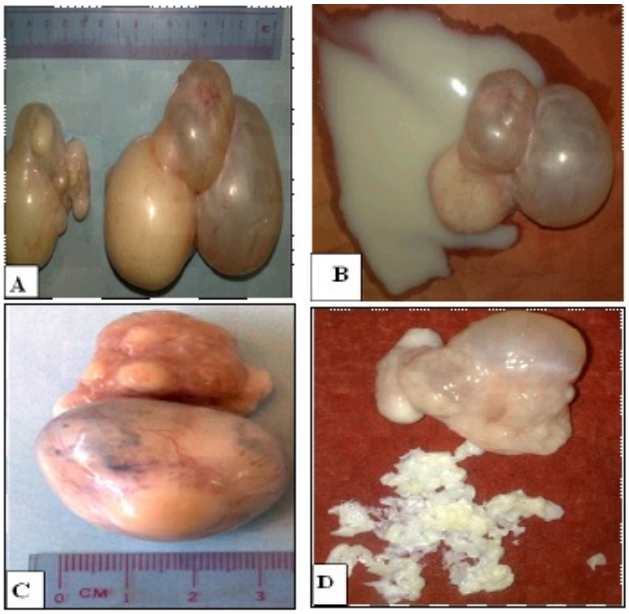

Figure 4: Organized cyst (A) double and bilateral cyst (B) white or yellowish fluid like soup after incision cyst (C) organized cyst40 mm in diameter (D) organized clot like cheesy material inside cyst appear after incision.

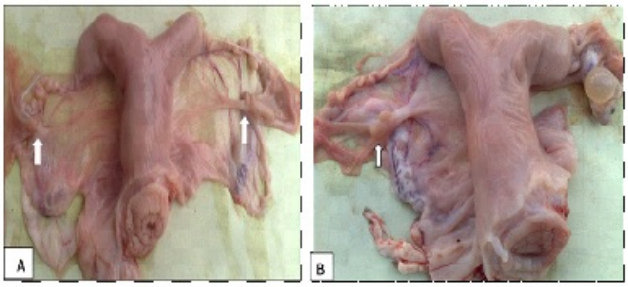

Figure 5: Ovarian agenesis (A) bilateral, (B) Left unilateral agenesis with normal right ovary and have large follicle.

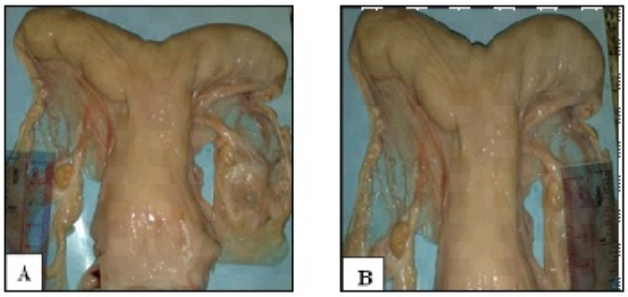

Figure 6: Ovarian hypoplasia (A) left ovary 10 mm (B) right ovary 8 mm in length.

Discussion

The incidence and pathology of the genital tract affections of she camel provide valuable information that can be used in evaluation of animal reproduction. The present study revealed that the total incidence of ovarian affections was 7% of all examined ovaries of she camels. This incidence was nearly similar to that recorded Hamouda et al. [10,15] who found that the incidence of ovarian affections of she camel was 10.4% and 10.16% respectively, while lower incidence (4.49%) was recorded Ribadu et al. [16].

Previous studies reported that the cystic conditions of the ovary represent the major disorders of the total ovarian affections. Incidence of ovarian cysts in she camels varied from 0.9% [17], 3.39% [18], 3.83% [10] to 5.2% [15]. Ovarian cysts did not constitute a major infertility problem in the investigated female camels. Although ovarian cysts have been described in dromedaries [19,20], the cystic ovary condition is not well documented as in cattle or other domestic animals. In fact, the term "cystic ovaries" does not always apply to camelidae because some females develop follicular cyst if not bred, as ovulation in these species is induced [21].

Follicular, luteal and hemorrhagic 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 [6]. This lack or insufficient LH release could be due to a hypothalamo-pituitory function disturbance or to 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 [22].

Ovarian cysts were classified in this study according to the structure involved and their appearance. Follicular cysts represented 3% of all examined ovaries and the incidence of follicular cysts was higher than that of recorded luteal cysts in the present work (1%). The luteal cysts originate from luteinization of follicular cyst, which occurred as a result of transformation of the granulosa cells into lutein cells. Similar results were obtained Shawky et al. [15]. Non-ovulating follicle continued to grow and reached a maximum diameter (30-50 mm) diameter felt as goose egg with some fluctuation which agrees with findings obtained Tibary et al. [23].

Hemorrhagic cysts were detected in this study with an incidence of (1%) of all examined ovaries. In the previous studies the incidence of hemorrhagic cysts in her camel were (1.4%) Shawky et al. [15], (1.33%) Hamouda et al. [10]. Adams et al. [24] suggested that the high incidence of hemorrhagic follicles in non-mated Llamas was not pathologic. Moreover, Tibary and Anouassi [7] mentioned that, follicular and hemorrhagic cysts are a normal evolution of non-ovulatory follicles in 30 to 40% of female camels. However, up till now it is not well known whether this type of cyst is a true abnormality or a physiological state. This seems probable that these cysts may be due to some pathological changes during growth of a follicular cyst resulting in quick bleeding with accumulation of the blood within the cyst forming a hemorrhagic cyst. Therefore, further studies are needed to clarify the mechanism of development of hemorrhagic cysts in camels. The results of the present study revealed that there is no effect of the season on different ovarian abnormalities. These findings are in accordance with the findings of [10].

Miscellaneous causes of female camel's infertility included anomalies of the ovary. It might be interesting to record bilateral and unilateral ovarian agenesis during the collection of 500 ovaries which is in agreement, in part, with the results of Dafalla et al. [11] who examined about 900 female genital tracts and recorded only one case of unilateral ovarian agenesis. While Musa [25] examined 722 camels for presence of anomalies and he did not observe ovarian agenesis. Also El-Wishy [17] carried a similar survey and examined 1048 genital organs from non-pregnant camels and 497 from pregnant ones and he did not report such conditions. In recent study by Abou-Nawwara [26] who examined 270 genital tracts of camels after slaughtering and he did not report such conditions. The rest of genital tract in case of unilateral and bilateral ovarian agenesis was normal in this study. But Kennedy and Miller [27] revealed that the tubular genitalia may be absent or underdeveloped in bilateral ovarian agenesis.

Ovarian hypoplasia was diagnosed in one case. It was bilateral and the ovary was very small, oval in shape and measured (10 mm x 5 mm and 8 mm x 5 mm) in length x breadth for left and right ovary, respectively. Similar findings were revealed Melaku et al. [28].

Conclusion

The study was concluded that, breeding season played no role on the incidences of different ovarian affections. Moreover, cystic Ovaries was the most prevalent pathological conditions among the recorded ovarian affections and represented mainly by follicular cysts followed by luteal cysts and hemorrhagic cysts and these affections seem to play a role on ovarian dysfunction, reproduction performance and infertility in dromedary camel.

Acknowledgements

The researchers thank Bassatein and Nahia slaughterhouses staff in Cairo and Giza provinces, Egypt for letting us to conduct our research methodology and samples collection. Also, the research team esteemed greatly the great help of either slaughterhouses managers.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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