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VAGINAL ELECTRICAL RESISTANCE (VER) TO MONITOR FOLLICULAR CHANGES AND PREGNANCY IN CAMELS

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ABSTRACT

Lactating non pregnant female camels (n = 12) were examined every alternate day by transrectal ultrasonography and the vaginal electrical resistance (VER) was recorded during the breeding season in order to evaluate the correlation of follicle dimensions and VER, for using VER to evaluate oestrus and pregnancy in she camels. Follicular growth and ovulatory size follicle was evident in 66.66% she camels during the 1st month of the breeding season. In 33.33% she camels, although follicular growth was evident but the follicle did not reach ovulatory size. The VER in she camels when there was no follicle, a follicle of < 5 mm, follicle 5 – 10 mm and follicle > 10 mm was 37.67 ± 0.09, 38.09 ± 0.12, 38.80 ± 0.13 and 39.0 ± 0.0 ohms, respectively. The values did not differ significantly. Behavioural receptivity of females towards stud camels was erroneous and females evidenced respectiveness, towards studs in the presence of an ovarian follicle irrespective of its size. The cocking of tail was an accurate sign of pregnancy in she camels at day 15 to 25 and ultrasonography could detect foetus and its annexes with high accuracy at 30 days of pregnancy. The VER in pregnant camels was 37.67 ± 0.33 which did not differ from non pregnant she camels. It was concluded that VER has got poor relationship with follicle diameter in female camels either for estrus or pregnancy detection.

Key words: Camel, follicle, ultrasonography, VER

Approaches to time mating in camels utilise the detection of an ovulatory size follicle (≥1.0 cm) (Skidmore *et al,* 1996; Vyas *et al,* 2002), behavioural receptivity of females (Purohit and Pareek, 2000) and transrectal palpation of a follicle (Abou-Ela, 1994). In many other species, the use of vaginal electrical resistance (VER) to detect oestrus and time mating has been well documented (Abou-Ela *et al,* 1982; Purohit and Gupta, 2000; Adam *et al,* 1981; Rezac and Olic, 2006). Since camels do not clearly define oestrous cycle (Skidmore *et al,* 1996; Tibary and Anouassi, 1997) monitoring vaginal electrical resistance in relation to the follicle size could be useful. In the present study, we examined the vaginal electrical resistance in female camels in relation to follicle size and behavioural oestrus and also followed the same for evaluating pregnancy in mated dromedary female camels.

Materials and Methods

The present study was conducted on lactating non pregnant healthy female dromedary (*Camelus dromedarius*) camels located at the National Research Centre on camels, Jorbeer Bikaner during the breeding season. Camels were maintained under uniform conditions of management in open paddocks.

Follicle evaluation and VER recording

Camels were restrained in sternal recumbency after mild sedation with xylazine hydrochloride was achieved (Vyas and Sahani, 2000). Camels (n=12) were examined by transrectal ultrasonography on every alternate day, using a dual frequency linear array probe (Agroscan ECM, France) as per method described by Vyas and Sahani (2000). The rectum was evacuated and the probe protected in a disposable sleeve and gel added was introduced in the rectum and both the ovaries were scanned separately. The ovarian structures were recorded and images saved in a multimedia (Sony, Japan) attached to the ultrasound machine. The follicle diameters were also measured. The vaginal electrical resistance was measured by a commercially available probe (for cattle) (Hauptner, Germany) as described for buffalo (Gupta and Purohit, 2001). The probe was introduced in the

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cranial part of vagina (Fig 1) and the resistance was measured by pressing the button.

The receptivity of females towards the stud camel was also observed daily during the period of study and cocking of tail was recorded post mating in all camels.

Females were mated with virile stud camels when the size of follicle was observed to be > 1.0 cm. VER was recorded up to 30 days post mating irrespective of whether or not the females became pregnant.

Results

Follicle diameters and VER

Serial ultrasonographic examinations revealed follicular growth (Fig 2) and ovulatory size follicle (Fig 3) in 66.66% (8/12) camels within the 1st month (November) of the breeding season, whereas follicular growth was found in 100% (12/12) during the 2nd month (December) of the breeding season. In 33.33% (4/12) of camels, although follicular growth was observed during the 1st month of the breeding season but it did not reach ovulatory size. The VER recorded during the study evidenced non significant differences between the different follicle diameters (Table 1). VER was not significantly low at oestrus in camels under study. A total of 66.66% (8/12) camels were found pregnant by transrectal ultrasonography at 30 days post mating. However, there was non significant difference in the VER in pregnant camels.

Table 1. Vaginal Electrical Resistance (VER) in she camels in relation to follicle dimensions and pregancy.

S No.	Follicle dimensions/ pregnancy	Number of observation	V E R (In ohms) (Mean ± SE)
1	No follicle	55	37.67 ± 0.09
2	Follicle < 05mm	33	38.09 ± 0.12
3	Follicle 05 to10mm	12	38.80 ± 0.13
4	Follicle >10mm	12	39.00 ± 0.00
5	Gravid uterus	8	37.67 ± 0.33

Behavioural receptivity and tail cocking in female camels evidenced erroneous receptivity towards stud camels. All camels with follicle growth evidenced receptivity towards stud irrespective of the follicle diameter. Cocking of tail was shown by all pregnant camels (Fig 4) at day15 to day 25 post mating.

Discussion

In present study follicular growth was observed in all camels during the 1st month of the breeding season, However, the follicle attained an ovulatory size in 66.66% camels only. This could probably be because of the transition phase of camels as mentioned previously (Sghiri and Driancourt, 1989). The season affects the growth of the dominant follicle although, the other characteristics of the follicular wave are not affected (Manjunatha *et al,* 2012). Mating of camels was done when the follicle attained a size of < 1.0 cm, as previous studies in camels have also mentioned that the optimum diameter of camels for mating is 1.0 – 2.0 cm (Skidmore *et al,* 1996; Dholpuria *et al,* 2012).

In present study the vaginal electrical resistance (VER) recording in 12 she camels did not reveal significantly different values, when there was no follicle, follicle with < 5 mm diameter, follicle with 5 – 10 mm diameter, follicle > 10 mm diameter and gravid uterus. The oestrous phenomenon in female camels appears to be different from other domestic animals and there is lack of well defined synchronous oestrus (Joshi, 1972; Skidmore *et al,* 1996). All the more the vaginal secretions and congestion is less marked in oestrus female camels (Leese, 1927). Thus, the changes in VER were probably not marked because of lower blood supply and scanty vaginal fluids which are known to increase the conductivity and decrease the resistance in cows (Feldmann *et al,* 1978).

In the present study the behavioural receptivity of female camels towards the stud was not synchronous to the presence of a mature ovulatory size follicle. This reflects that behavioural receptivity of female camels appears to be a poor breeding approach Although, the species is an induced ovulator and in the absence of mating ovulation fails to occur. Previous reports have also shown that mating of female camels solely on the basis of receptivity does not result in optimum conceptions (Abou-Ela, 1994; Vyas and Sahani, 2000).

Only 66.66% camels were pregnant during the present study. It has been mentioned that many factors affect conception besides mating and size of follicle (El-Harairy *et al,* 2010).

The diagnosis of pregnancy at 15-25 days of per meating was accurate with the behavioural tail cocking and 100% pregnant camels evidenced this behaviour during the present study. Similar findings have also been mentioned for camels (Rathore, 1985; Vyas and Pareek, 1982). Pregnancy diagnosis by ultrasonography was also accurate at day 30, post mating and the foetus and its annexes could be easily visualised at this time. Similar descriptions have been

Fig 1. Recording of vaginal electrical resistance in a female camels restrained in sternal recumbancy.

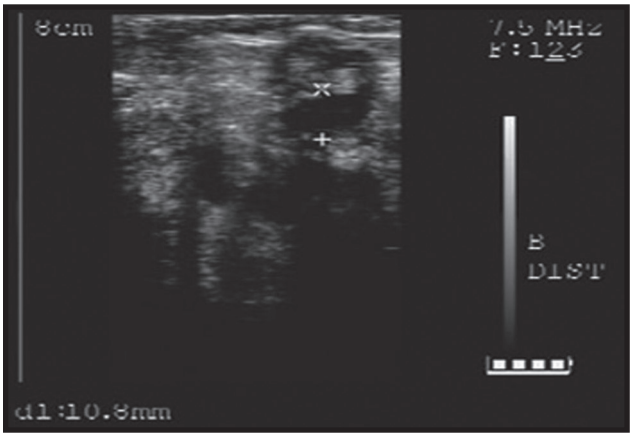

Fig 3. Ultrasonogram of a female camel showing a mature ovulatory size (≥1.0 cm) Follicle during November.

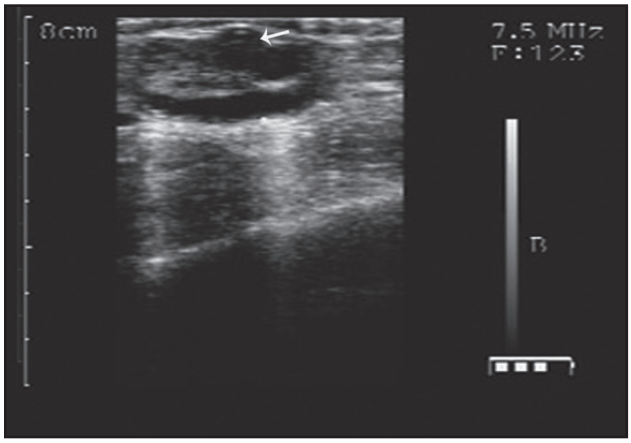

Fig 2. Ultrasonogram of a female camel showing follicular growth during November month.

Fig 4. Cocking of tail shown by a pregnant female camel.

previously recorded in studies on camels (Vyas *et al*, 2002).

Vaginal electrical resistance was found to be of little help in the diagnosis of pregnancy in camel. This could be because of lack of clearly defined oestrus in camel and although, a few workers found VER to be useful in pregnancy diagnosis in cows (Meena *et al*, 2003) and buffaloes (Gupta and Purohit, 2001), others failed to observe the technique to be useful (Cavenstany and Foote, 1985). The pregnancy was diagnosed by lowering of VER in cows returning to oestrus and not because of the presence of a foetus.

It was conducted that VER has got poor relationship with follicle diameter in female camel and cannot be used for either oestrus detection or pregnancy diagnosis.

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