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## Association of body condition score with uterine inflammatory diseases in crossbred cows

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**Abstract**

The primary aim of this study was to evaluate the effect of body condition score (BCS) on various uterine inflammatory diseases. The present study was conducted on 96 crossbred cows having the history of abnormal puerperium. All these cows were categorized into three inflammatory group viz. Metritis (A), Clinical endometritis (B), Subclinical endometritis (C) and control group (D) on the basis of examination of cervico-vaginal discharge quality and response to white side test. Each cow was evaluated for body condition score by visual and tactile method. The mean body condition score of cows in metritis, clinical endometritis, subclinical endometritis and control group were  $2.5 \pm 0.10$ ,  $2.73 \pm 0.12$ ,  $3.73 \pm 0.11$  and  $3.83 \pm 0.16$  respectively. Statistical analysis of data revealed that the body condition score (BCS) in crossbred cows of the inflammatory group 'A' (Metritis) and group 'B' (clinical endometritis) did not differ significantly ( $p < 0.01$ ) from each other; similarly the mean body condition score of group 'C' (subclinical endometritis) and group 'D' (control) crossbred cows also did not differ significantly from each other. However, mean body condition score in uterine inflammatory group 'C' and 'D' was significantly higher ( $p < 0.01$ ) than the mean BCS of remaining two groups 'A' and 'B'.

**Keywords:** Abnormal puerperium, body condition score, uterine inflammatory disease

**Introduction**

Body condition is reflection of the body fat reserves carried by the animal. These reserves can be used by the cow in periods when she is unable to eat enough to satisfy her energy needs. In high yielders cows, this normally happens during early lactation, but it may also happen when cows get sick, fed poor quality feeds, or feed intake is restricted. The recent studies conducted on relationship between body condition score and development of uterine inflammatory diseases such as metritis, clinical endometritis and subclinical endometritis are reported exhibiting mixed view. Roche *et al.* (2004) <sup>[1]</sup> reported that all the cows appeared to be healthy and without conspicuous genital tract exudates had the body condition score greater than 2.5, whereas, Gautam *et al.* (2010) <sup>[2]</sup> found no significant effect of body condition score on the incidence of postpartum endometritis though Kasimanickam *et al.* (2013) <sup>[3]</sup> reported that body condition was lower in cows with metritis or clinical endometritis compared to normal cows. Kadivar *et al.* (2014) <sup>[4]</sup> concluded in their study that low BCS is a risk factor for postpartum endometritis and delayed cyclicity in dairy cows. Kaya *et al.* (2016) <sup>[5]</sup> found non-significant difference between cows in control group ( $2.6 \pm 0.11$ ) and cows with endometritis (mild:  $2.63 \pm 0.12$ , moderate:  $2.74 \pm 0.12$  and severe endometritis:  $2.28 \pm 0.13$ ) in terms of BCS ( $p > 0.05$ ). The present study was carried out with objective to evaluate association of body condition score and development of uterine inflammatory diseases in crossbred cows.

**Materials and Methods**

The present study was conducted on 96 crossbred cows belonging to the villages of Mhow and cows presented to the Veterinary Clinical Complex, Department of Veterinary Gynecology and Obstetrics, College of Veterinary Science and Animal Husbandry, Mhow, District- Indore (M.P.) having the history of abnormal puerperium. All these cows were categorized into three inflammatory group viz. Metritis (A), Clinical endometritis (B), Subclinical endometritis (C) and one control group (D) on the basis of examination of cervico-vaginal discharge and response to white side test. Each cow was evaluated for body condition score by visual and tactile examination of fat deposited around vertebrae of the backbone, hook and pin bones as given in the table 1. The cows were scored on 1 (Emaciated) to 5 (Fat) point scale as described by Rodenburg (2012) <sup>[6]</sup>.

**Table 1:** Assessment of body condition score

| Assessment   | Body condition | Score |
|--|----------------|-------|
| The ends of the short ribs are sharp to the touch, vertebrae of the backbone are prominent, hook and pin bones are sharply defined.                              | Emaciated      | 1     |
| The ends of the short ribs can be felt but they and the individual vertebrae are less visibly prominent. The hook and pin bones are prominent.                   | Thin           | 2     |
| Short ribs can be felt by applying slight pressure, hook and pin bones are round and smoothed over.  | Average        | 3     |
| Individual short ribs can be felt only when firm pressure is applied, hook bones are smoothed over and the span between the hook bones over the backbone is flat | Heavy          | 4     |
| The bone structure of the topline, hook and pin bones and the short ribs is not visible. Fat deposits around the tailbone and over the ribs are obvious          | Fat            | 5     |

## Results and Discussion

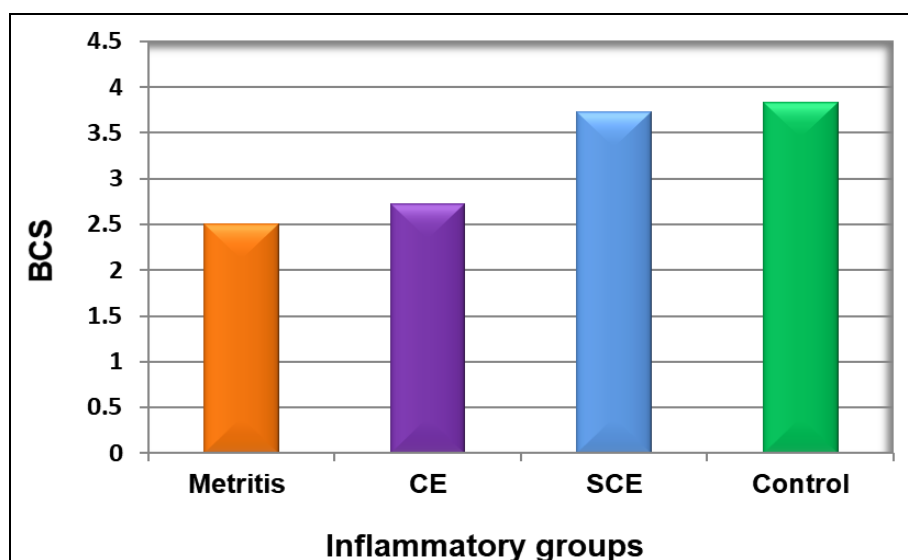
In the present study mean body condition score in metritis, clinical endometritis, subclinical endometritis and control group cows were  $2.5 \pm 0.10$ ,  $2.73 \pm 0.12$ ,  $3.73 \pm 0.11$  and  $3.83 \pm 0.16$ , respectively, as mentioned in the table 2, figure 1. Statistical analysis of data using online software WASP 1 (Web Agri Stat Package) revealed that the body condition score (BCS) in the inflammatory group 'A' (Metritis) and

group 'B' (clinical endometritis) crossbred cows did not differ significantly ( $p < 0.01$ ) from each other; similarly the mean body condition score of group 'C' (subclinical endometritis) and group 'D' (control) crossbred cows also did not differ significantly from each other. However, mean body condition score in uterine inflammatory group 'C' and 'D' was significantly higher ( $p < 0.01$ ) than the mean BCS of remaining two groups 'A' and 'B'. (Table 2, Figure 1)

**Table 2:** Body condition score in uterine inflammatory group cows

| S. No. | Uterine Inflammatory Groups | No. of animals | Group wise body condition score (Mean $\pm$ SE) |
|--------|-----------------------------|----------------|---|
| 1      | Group "A" (Metritis)        | 30             | $2.50 \pm 0.10^b$                               |
| 2      | Group "B" (CE)              | 30             | $2.73 \pm 0.12^b$                               |
| 3      | Group "C" (SCE)             | 30             | $3.73 \pm 0.11^a$                               |
| 4      | Group "D" (Control)         | 06             | $3.83 \pm 0.16^a$                               |

Similar superscript do not differ significantly ( $P < 0.01$ )

**Fig 1:** Body condition score (BCS) in uterine inflammatory group cows

In present study, the body condition score of control group cows and subclinical group cows was higher than the metritis and clinical endometritis group cows. The findings are in close conformity with the findings of Kasimanickam *et al.* (2013) [3] who reported that the body condition was lower for cows with metritis or clinical endometritis as compared to normal cows.

The findings are also in accordance with the findings of Kadivar *et al.* (2014) [4] who reported that cows with clinical endometritis had significantly lower body condition score (BCS) than normal cows at all weeks of pre and post calving. They also concluded that low BCS is a risk factor for postpartum endometritis and delayed cyclicity in dairy cows. Gautam *et al.* (2010) [2] Potter *et al.* (2010) [7] and Kaya *et al.*

(2016) [5] did not find significant differences between control group cows as compared to cows suffering with endometritis. Salah *et al.* (2017) [8] also did not observe association between BCS and occurrence of clinical endometritis, however, Carneiro *et al.* (2014) [9] observed that cows with a BCS  $\leq 2.50$  showed higher prevalence of subclinical endometritis ( $P < 0.05$ ) than the cows with BCS  $\geq 2.75$ . In a study by Priest *et al.* (2013) [10] observed lower BCS in cows to be associated with subclinical endometritis.

Similar to the observations of present study, Bacha and Regassa (2009) [11] reported that the BCS had an effect on the occurrence of subclinical endometritis when evaluated 4 weeks after parturition. They found that 64.5% of the cows with a BCS  $\leq 2.50$  had subclinical endometritis, and in the

cows with a BCS  $\geq 2.50$ , only 28.6% were positive for subclinical endometritis. Dubuc *et al.* (2010)<sup>[12]</sup> observed that more cows had subclinical endometritis when their BCS was lower than 2.75 and were likely to develop different grades of uterine inflammatory disease. This may be probably for different nutritional problems both in the emaciated or the thin cows since negative energy balance (NEB) is often linked with severe and prolonged uterine inflammation and delayed uterine involution, which appears to be associated with a lack of bacterial killing after ingestion by phagocytes (LeBlanc *et al.*, 2011 and Ingvarsten *et al.*, 2013)<sup>[13, 14]</sup>.

### Conclusion

In present study, highest metritis and CE (clinical endometritis) rates were observed in emaciated and thin cows having mean BCS  $< 2.73 \pm 0.12$ . At the same time, the lowest occurrence of metritis and CE were recorded in average cows having mean BCS  $> 2.73 \pm 0.12$ . It could be speculated that the BCS had a significant influence on the development of different intensity of uterine inflammatory diseases such as metritis and clinical endometritis.

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