

## HORMONAL THERAPY FOR TREATMENT OF FOLLICULAR CYST IN CROSSBRED COWS UNDER FIELD CONDITIONS

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Received: 04.06.2024; Accepted: 01.08.2024

### SUMMARY

Crossbred cows (n=10) with follicular cyst were subjected to modified ovsynch protocol, where they were treated with first dose of GnRH @ 20 µg on day 0 followed later by inj. prostaglandin on day 10 to induce estrus. The animals were artificially inseminated twice at 12 and 24 hrs with good quality frozen semen during induced estrus with concurrent second dose of GnRH @ 10 µg at first insemination to ensure timed ovulation. Nine animals (90%) responded to treatment with luteinization of cyst(s), which was confirmed on day 10 post-treatment. Four animals (40.0%) got conceived at induced estrus and four (40.0%) animals conceived by third cycle yielding 80 percent conception rate among treated animals. One responding animal did not conceive after third cycle, while one animal did not respond to treatment. Present study led to conclusion that follicular cyst may be effectively treated with modified ovsynch protocol in crossbred cows.

**Keywords:** Crossbred Cows, Follicular Cyst, Ovsynch

**How to cite:** Awasthi, M.K. and Paikra, D.K. (2025). Hormonal therapy for treatment of follicular cyst in crossbred cows under field conditions. *The Haryana Veterinarian* 64(1): 98-100.

Cystic ovarian degeneration (COD) is regarded as one of the major functional disorders of genital system affecting the fertility and extending the inter-calving period of dairy cattle (Silvia *et al.*, 2005; Vanholder *et al.*, 2006) with great economic losses to dairy farmers (Scott and Dobson, 1997). It is observed that up to 60% cows develop ovarian cyst(s) before first postpartum ovulation (Kesler *et al.*, 1979) but usually they regress spontaneously within 10 days without affecting the fertility. If cysts persist for longer duration animals become infertile with irregular estrus or enters into anestrus (Noakes *et al.*, 2009). The most widely accepted etiology for the origin of follicular cyst is aberrations in preovulatory surge of luteinizing hormone (Dutt and Singh, 2023). It has been reported that high yielding HF crossbred cows are mostly affected with ovarian cysts in the age group of 5-6 years and 3<sup>rd</sup> parity (Meena *et al.*, 2022) coinciding with peak milk production. Several approaches to treatment of follicular cyst have been tried with conception rate varying from 30 to 66.66%. These included administration of hCG (Dutt *et al.*, 2019), GnRH (Nanda *et al.*, 1988; Verma and Dabas, 1994), combination of GnRH and PG, combination of ovsynch plus progesterone (Meena *et al.*, 2022) and with combination of GnRH-hCG-PRID or CIDR (Gad *et al.*, 2022). In this perspective, an attempt was made in present study to evaluate the efficacy of ovsynch protocol with some modifications for treatment of follicular cyst(s) in crossbred HF cows under field conditions.

Ten infertile HF crossbred cows with the history of irregular estrous cycle and belonging to private dairy

farms located nearby Durg and Bhilai were included in the study. Anamnesis indicated mean calving to submission for treatment interval ranged between 3 and 5 months. All these animals were between second and third lactation; aging between 4-6 years and these case were presented during winter months (November to February). Gynaecological examination of these animals was carried out at 10 days interval to observe any structural changes on the ovaries. Repeated rectal palpations revealed presence of soft, fluctuating, fluid-filled, large cyst(s) on the ovaries and were diagnosed as follicular cyst. The number, size, location and characteristics of these cyst(s) were noted before initiating the treatment for comparison during subsequent examination to assess the response to treatment. All these animals were treated with initial dose of 20 µg Buserelin acetate, a GnRH analogue (Inj.Receptal® @ 5.0 ml) intramuscularly. Animals showing change in their behavioural symptoms i.e. disappearance of mounting behaviour were gynaeco-clinically examined per rectum on day 10. Responding animals with luteinization of cyst(s) as indicated by thickening of cyst wall were treated with Inj. Cloprostinol @ 500 µg, a synthetic analogue of PGF<sup>2</sup>α (Inj.Pragma® 2.0 ml) on day 10 to induce estrus. Treated animals were monitored for signs of estrus and inseminated with frozen semen twice at 12 and 24 hrs during induced estrus with concurrent second dose of 10 µg GnRH at first insemination to ensure timed ovulation and to prevent possibility of recurrence of cyst formation. The animals returning to estrus were re-inseminated with 10 µg GnRH until conceived or up to third cycle. Pregnancy was confirmed between day 50 and 60 post-insemination

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in non-return cases by palpation per rectum. The non-responding animal (n=1) was retreated with a second dose of GnRH at an interval of 21 days.

The mounting behaviour of affected animals disappeared within two days of GnRH treatment in 9 (90%) cows indicating the initiation of luteinization of cyst(s). The texture of cyst changed with thickening of cyst wall in responding animals when examined on day 10. With prostaglandin treatment all the animals exhibited signs of estrus within 3 to 5 days. After insemination with a second dose of GnRH, 4 (40.0%) animals conceived at induced estrus. The returning animals (n=5) exhibited their subsequent estrus at regular interval and recurrence of cyst was not observed in them. They were inseminated with concurrent dose of 10 µg GnRH in subsequent estruses and 4 (40.0%) animals conceived by third cycle thus, 80% conception rate was achieved among treated animals (8/10). One animal did not respond to treatment with two doses of GnRH at an interval of 21 days, while one returning animal did not conceive up to third cycle.

The follicular cysts develop owing to aberrations of reproductive neuro-endocrine system, causing aberrant patterns of LH release during genesis of ovulatory follicle with absence of LH surge. It has been demonstrated that abnormality in pattern of LH secretion is the result of partial or complete failure of estradiol to elicit positive feedback effect on secretion of LH (Nanda *et al.*, 1991). This appears to be due to failure or lack of sensitivity of hypothalamic surge-generating centre to estradiol (Garverick, 2007) and a failure of GnRH release (Vanholder *et al.*, 2006). In the light of above facts, the cases of follicular cyst have been successfully treated with GnRH, which induces LH surge similar to that occurs at ovulation within 2 to 3 hrs of treatment (Dobson and Alam, 1987). Lower doses of GnRH cause luteinization of cysts (Kesler *et al.*, 1981); whereas higher doses probably cause ovulation of new follicle and formation of CL (Berchtold and Brummer, 1980). Treatment with initial dose of GnRH results in increased progesterone level, which results into negative feedback effect on LH secretion and resets the sensitivity of pituitary to estradiol (Gumen and Wiltbank, 2002). Based on these reports, initial dose of 20 µg GnRH was administered instead of standard 10 µg used for ovsynch protocol in the present study. The mounting behaviour in majority of affected animals ceased within two days of GnRH treatment in current study, suggesting that treatment quickly initiated the process of luteinization of cyst(s). These observations are similar to the observations of Dobson *et al.* (1977) and Majumdar (1989); however, Verma and Dabas (1994) reported lower recovery rate (60%). The fertile estrus is usually observed within 30

days of GnRH treatment (Kesler and Garverick, 1982). In an attempt to reduce the interval between treatment and first service, it is suggested that treatment of cyst could be managed by giving GnRH when the cyst is diagnosed followed 9-10 days later by treatment with PG. In standard ovsynch protocol, PG treatment is given on day 7; however, PG was administered on day 10 in present study so as to ensure complete luteinization of cyst making PG treatment effective. Instead of timed A.I. at predetermined time in ovsynch protocol, insemination was accomplished in treated animals twice at 12 hrs interval following AM-PM rule at induced estrus, which was recorded within 3 to 5 days after PG treatment in present study. Thus, recovery period was significantly reduced without disturbing the recovery and conception after PG treatment.

An initial GnRH injection when followed by another injection at the time of insemination at induced estrus has been found to have beneficial effect on conception rate owing to timed ovulation and that helps to prevent the recurrence of cyst development also. Four animals conceived at induced estrus when responding animals were treated with a second dose of GnRH at the time AI in the present study. These results approximate with the findings reported by Kesler *et al.* (1978) and Ax *et al.* (1986) who reported 50 to 60% conception rate to first service with overall conception rate to three inseminations ranging from 80 to 100%. Recurrence of cyst may occur after apparent initial recovery following GnRH treatment probably due to persistence of some unknown hormonal disturbances in hypothalamo-pituitary axis (Nanda *et al.*, 1988). Therefore, it would be appropriate to give a second dose of GnRH at induced estrus to ensure timed ovulation and to prevent recurrence of cyst.

One cow, which did not respond to initial dose of GnRH was retreated with a second dose of GnRH at 21 days interval but she failed to respond. Lack of response to GnRH treatment is probably not due to failure of adequate LH release (Kesler *et al.*, 1979) but probably it is due to inability of cystic structure to respond to LH surge because of fibrosis (Rankin, 1974), degenerated granulosa and theca layer (Bierschwal *et al.*, 1980) or an insufficient number of LH receptors in follicular cells (Brown *et al.*, 1986). Hence, repetition of GnRH therapy is not warranted for treatment in non-responsive cases (Nanda *et al.*, 1988). From the findings of the current study, it is concluded that use of Ovsynch protocol with certain modifications is an appropriate approach for effective treatment of follicular cyst under field conditions. A second dose of GnRH at the time of AI during induced estrus may be helpful to increase conception rate and to prevent recurrence of cyst in recovered animals.

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## RETRACTION OF ARTICLE

This article earlier available at <https://www.luvas.edu.in/haryana-veterinarian/download/harvet2016-dec/1.pdf> entitled “Occurrence of some organochlorine pesticide residues in poultry feed and meat” has been retracted by the authors because of some error made during the data analysis process of the experimental observations due to counting the number of samples showing the concentration of pesticide below its corresponding Limit of Detection. All authors take full responsibility for this mistake and sincerely apologize for any inconvenience it may cause.

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