Journal of Advanced Veterinary Research Volume 6, Issue 4 (2016) 108-111

Journal of Advanced Veterinary Research

http://advetresearch.com/index.php/avr/index

Ovarian Cyst in Crossbred Cattle of Temperate Region- A Retrospective Study of 54 Cases

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ARTICLE INFO

Original Research

Received:
12 June 2016

Accepted:
21 July 2016

Keywords:

Ovarian cyst
Crossbred cattle
Temperate region
Prevalence
Management

ABSTRACT

The present study was conducted with an objective to extract all possible interrelated etiological factors of cystic ovary and to evaluate the best treatment protocol in dairy cattle under field condition of temperate region. A total of 54 cattle (47 cows and 7 heifers), suffering from ovarian cyst were retrospectively used to study prevalence and outcome of the disease over a period of 5 years. Highest prevalence was recorded in crossbred Jersey, in 2nd lactation and during summer. Major clinical signs showed by the animals with ovarian cysts (OC) were either repeat breeding or anestrus. In case of repeat breeding, irregular cycle (sometimes short and sometimes long in the same cow) in 23.33% (7/30), nymphomania in 13.33% (4/30), short cycle (10-15 days) in 23.33% (7/30) and long cycle (23-30 days) in 10% (3/30) cases were noticed. In remaining 30% cases (9/30) normal cycles were noticed. Right ovary affected more than left one and mean number of cysts recorded were 1.17 per animal. Follicular cysts could be treated with GnRH in 75% (9/12) cases, and, luteal cysts with cloprostenol in 83.33% (10/12) cases. However, in cases where cyst could not be differentiated by rectal palpation, administration of cloprostenol 9 days after HCG treatment was found 66.67% (8/12) effective in curing the disease. It is concluded that both follicular and luteal cysts can be treated successfully with GnRH/hCG and prostaglandin or its analogue, respectively.

J. Adv. Vet. Res. (2016), 6 (4),101-104

Introduction

Ovarian cyst (OC) is a common and economically significant condition of dairy cattle (Johnson and Coates, 2004). Cysts in dairy cows is an anovulatory follicular structure 2.5 cm or larger in diameter that persist on an average for 10-13 days (Arbeiter *et al*., 1990; Hamilton *et al*., 1995). The condition has been referred to many names over the past century including adrenal virilism, nymphomania, cystic ovarian degeneration, cystic ovaries, ovarian cysts or cystic cows (Roberts, 1971; Garverick, 1997). More recently, OC has been defined as anovulatory follicles (<2 cm) on one or both ovaries that fail to regress maintaining growth and steroidogenesis and interfere with normal ovarian cyclicity (Vanholder *et al*., 2006). The absence of a corpus luteum is an essential OC criterion (Arbeiter *et al*., 1990). The reported incidence varies from 6.7 to 13.1% (Brito and Palmer, 2004). Cystic cows have extent calving-to-conception and calving intervals by many days over unaffected one, resulting in significant economic losses in the dairy industry (Isobe, 2007; Jeengar *et al*., 2014). Several works were carried out covering occurrence, causes, costs and treatment therapy (Nanda *et al*., 1988; Garverick, 1997). However, comprehensive report covering all possible interrelated factors of the disease is hardly available in the literature. Most of these findings are actually some case studies or based on less numbers of observations. The present study records prevalence and management of ovarian cysts in crossbred cattle from rural tracts of Kashmir valley, a temperate region of India, during a five years study period under a defined study area.

Materials and methods

A total of 54 crossbred cattle (47 cows and 7 heifers) suffering from ovarian cysts formed the subject of the study. All the animals belonged to a particular location over a five years period from 2007 to 2011 and were maintained under uniform feeding and managemental practices of intensive system of rearing. The cysts were diagnosed by rectal palpation of the affected cattle that were presented after long anestrus or repeat breeding problems or during routine sexual health examination in few cases. Cysts were diagnosed with their specific characteristics during rectal palpation (Dabas, 1998).

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ISSN: 2090-6277/2090-6269/

Prevalence of the disease with respect to breed, parity, milk yield status, time of occurrence, season at the time of diagnosis, type of cyst, number of cysts, involvement in the ovary and other accompanying symptoms, if any, were recorded. Seasons were classified as spring (March, April and May), summer (June, July and August), autumn (September, October and November) and winter (December, January and February). Depending on the type of cysts animals were divided into three groups. Group-I animals with follicular cysts were treated with GnRH (Gonadotropin releasing hormone) analogue (Receptal, Intervet India Ltd., Chennai, India) at 5 ml/ animal intravenously (i/v). Group-II included animals with luteal cysts and was treated with 500 mcg of cloprostenol (Sarabhai-Zydus Animal health Ltd., India) intramuscularly (i/m). Group-III included animals in which cyst could not be confirmed by rectal palpation and were treated with 3000 I.U. HCG (Chorulon, Intervet, India Ltd.) i/v followed by 500 mcg cloprostenol 9 days after HCG administration i/m. (Table 1). Time required from initiation of treatment to subsequent estrus was recorded. The animals in estrus were inseminated artificially using frozen semen having at least 50% post thaw motility. Conception rate (CR) was determined by pregnancy diagnosis per-rectally at 60-70 days post-insemination.

Results

Highest prevalence of cystic ovary was recorded in crossbred Jersey, 2nd lactation and in summer season (Table 1).

Clinical symptoms shown by the affected animals were either repeat breeding (55.56%, 30/54) or anestrus (31.48%; 17/54). In 12.96% (7/54) cases cyst was diagnosed in routine clinical examination. In case of repeat breeding condition, animal repeated from 3 times to as many as 30 times (average 6 times). All the anestrus cases (31.48%) were found either in heifers or in those pluriparous cows, who remained anestrous for 6 months to 2 years (average 11.25 months) following calving.

Total numbers of follicular cysts diagnosed were 15 (27.78%), and luteal cysts were 19 (35.19%). Number of remaining 20 cases of cysts (37.04%) could not be diagnosed by rectal palpation.

Out of the total 15 follicular cysts diagnosed, repeat breeding was recorded in 13 (86.67%) and anestrus in 1 (6.67%) cases and remaining 1 case, cyst could be diagnosed during routine sexual health examination only. On the other hand, out of total 19 cases of luteal cysts diagnosed, anestrus was noticed in 11 cases (57.89%) and repeat breeding in 26.32% (5/19) cases. Luteal cysts in 15.79% cases (3/19) could be diagnosed during routine sexual health examination.

Mean number of cysts were 1.17 per animal (63/54). Multiple cysts were noticed in 7 cases out of which follicular cysts were recorded in 5 cases (71.43%) and in remaining 2 cases (28.47%) it was luteal. Right ovary affected more than left one. In group-I, II and III, 75.00, 83.33 and 66.67% animals recovered from the disease with 1st insemination conception rate of 88.89, 90.00 and 75.00% respectively.

Table 1. Prevalence of cystic ovary with respect to breed, parity and season (n.=54)

Sl. No	Parameters		No. of animals	Animals (%)
1	Breed	Crossbred Jersey	41	75.93
		Crossbred HF	13	24.07
2	Parity	Heifer	7	12.96
		1st	10	18.52
		2nd	15	27.78
		3rd	11	20.37
		4th	8	14.81
		5th, 6th and 7th	1 each	1.85 each
3	Season	Spring	17	31.48
		Summer	21	38.89
		Autumn	7	12.96
		Winter	9	16.67

Table 2. Showing treatment protocol

	No. of animals	No of animals recovered (%)	No. of animals conceived at 1st insemination (%)
Group-I	12	9 (75)	8 (88.89)
Group-II	12	10 (83.33)	9 (90)
Group-III	12	8 (66.67)	6 (75)

Discussion

Crossbred Jersey cows (41/54; 75.93%) outnumbered crossbred Holstein Frisian cows (Table 1). This might be due to its higher population in the study area. The prevalence of cystic ovary was highest in 2nd parity (Table 1) and was reduced thereafter as reported earlier (Roberts, 1998). Hernendez Ledzma *et al* (1984) observed that incidence of cystic ovary increased from 8.4% in primiparous cows to 25.9% in cows of 5th lactation. In the present study, no cyst was observed beyond 7th lactation. In 12.96% cases cyst was observed in heifers and it may be due to genetic nature of the disease. Heritability in cystic ovary condition varies from 0.05 to 0.4. Therefore, it is necessary to cull such heifers with ovarian cysts to eliminate the genetic nature of the disease and also to reduce its incidence in future generation. Average milk production of the affected cows (in case of lactating cows within 10 months of calving; n=24) was 9.8 liters (5-15 liters). Lactation stress may be a predisposing factor in occurrence of cystic ovary (Anonymous, 2008). Menge *et al*. (1962) reported a genetic correlation of 0.12 between milk production and ovarian cysts.

Highest prevalence (with respect to the time of diagnosis by rectal palpation) was recorded in summer followed by spring, winter and autumn respectively (Table 1). However, this result may not reflect actual relationship of the disease with respect to season as because animal may suffer from the disease quite ahead of diagnosis time.

Out of total 30 repeat breeding cases, irregular cycle (sometimes short and sometimes long in the same cow) in 23.33% (7/30), nymphomania in 13.33% (4/30), short cycle (10-15 days) in 23.33% (7/30) and long cycle (23-30 days) in 10% (3/30) cases were noticed. In remaining 30% cases (9/30) normal cycles were observed. Earlier report indicated that anestrus commonly occurs during the postpartum period (Kesler and Garverick, 1982) and irregular estrus intervals, nymphomania and development of masculine physical traits during later lactation (Roberts, 1971; Youngquist, 1986). A proportion of cows with follicular cysts can exhibit regular estrous cycles but a lowered fertility (Jeengar *et al*., 2014).

By rectal palpation almost 63% (62.97%) cyst could be diagnosed. Rectal palpation is the most common/ effective method for cystic ovary diagnosis (Brito and Palmer, 2004). However, differentiation between follicular and luteal cysts can not be made accurately with one examination by rectal palpation (Spreecher and Ax, 1988; Farin *et al*., 1990) and correct diagnosis is achieved only in 50% cases (Farin *et al*., 1992; Douthwaite and Dobson, 2000).

In the present study, repeat breeding in follicular cysts and anestrus in luteal cysts were predominantly observed. Earlier report also indicated that cows with luteinized cysts remain anoestrous in most cases (62-85%) as a result of the production of progesterone by luteinized cysts (Day, 1991; Watson and Cliff, 1997).

Right ovary affected more (53.70%: 29/54) than left one (38.89%: 21/54) and only in 7.41% (4/54) cases both ovary affected which corroborates the finding of Kaikini *et al*. (1983).

In some animals ovarian cyst was accompanied with cervicitis and or metritis or ovarian adhesions (7.41%; 4/54). Earlier report (Anonymous, 2008) indicated association of cystic ovary with metritis (14.6%) and retained fetal membranes (13.6%).

Two follicular cysts in two different animals (having two cysts in left ovary of each animal) were ruptured during mild manual palpation. Manual rupture without causing damage to the ovary is indicated (Roberts, 1971). However, forceful manual rupture is contraindicated because it can cause haemorrhage, subsequent adhesion and may contribute to lowered fertility (Seguin, 1980; Roberts, 1998).

In group-I, 9 animals recovered from the disease exhibiting estrus within 16 to 37 days (average; 21 days). Ijaz *et al*. (1987) recorded 65 to 80% recovery rate with LH, HCG or products high in LH activity. Kesler *et al*. (1978) reported that most cows showed estrus within 18-23 days after GnRH therapy. First insemination conception rate (CR) was recorded as 88.89%. This was higher than the reports of Singh (2002) using GnRH therapy. For treatment of ovarian cysts, both GnRH or its analogue and hCG appear to be equally effective with regards to treatment response and fertility (Peter, 2004) but the next estrus would occur 5-21 days after treatment (Kahn, 2010). Both GnRH and hCG elicit equivalent endocrine and clinical responses, but GnRH has an advantage over hCG in its minimal antigenicity (Drost and Thatcher, 1992).

Cloprostenol caused lysis of luteal cysts in 83.33% animals of group-II. This was similar to the findings of Singh (2002). All animals showed estrus within 5-14 days (8 days) and 90% CR was achieved. It is inferred that single injection of prostaglandin (PG) or its analogue is effective for treatment of luteal cysts (Ijaz *et al*., 1987; Nanda *et al*., 1988; Singh, 2002). In one study, 75% of the cows were in estrus within 7 days after treatment and pregnancy rates at first estrus were 66% (Brito and Palmer, 2004).

In group-III, 8 animals showed estrus within 13-16 days (average: 14 days) after hCG treatment. Administering PGF2α 9-12 days after GnRH or LH treatment is an effective method to shorten interval from GnRH or LH treatment and subsequent estrus (Brito and Palmer, 2004), because leteinization usually occurs 9-10 days after luteotropic therapy. Administration of PG earlier than 9 days after GnRH treatment is not successful; as there is high rate of cyst recurrence or persistence (Dabas, 1998). Six animals in this group conceived on 1st insemination (75%). It can be concluded that administering PG or its analogue 9 days after LH or GnRH therapy is most effective treatment for ovarian cyst without going differentiation of cyst type.

Conclusion

From this study, it can be concluded that routine sexual health examination is very much necessary for early diagnosis of ovarian cysts in crossbred cattle and thereby reducing calving interval and cost of rearing unproductive cows. The heifers with ovarian cysts should be culled to reduce possible involvement of the disease in future herd. Follicular and luteal cysts can be treated successfully with GnRH/hCG and prostaglandin or its analogue, respectively.

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