The Pharma Innovation Journal 2022; SP-11(7): 2250-2253

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(7): 2250-2253

www.thepharmajournal.com
Received: 14-05-2022
Accepted: 21-06-2022

MK Meena
Veterinary Officer, Govt. Veterinary Polyclinic, Animal Husbandry Department, Bundi, Rajasthan, India

Savita Meena
Regional Animal Diagnostic Center, Chetak Circle, Udaipur, Rajasthan, India

M Meena
Govt. Veterinary Polyclinic, Animal Husbandry Department, Baran, Rajasthan, India

GN Purohit
Department of Veterinary Gynaecology and Obstetrics, College of Veterinary and Animal Sciences, Rajasthan University of Veterinary and Animal Sciences, Bikaner, Rajasthan, India

Corresponding Author
MK Meena
Veterinary Officer, Govt. Veterinary Polyclinic, Animal Husbandry Department, Bundi, Rajasthan, India

Field approach to treat ovarian cysts in dairy cows

MK Meena, Savita Meena, M Meena and GN Purohit

Abstract
The present study evaluated the incidence of ovarian cysts (OC) in cows (n=40) according to age, breed, and parity and also evaluated the effect of therapy of such cows using a combination of OvSynch (GnRH day-0, PG- day 7 and GnRH-day 9) plus progesterone injection (750 mg IM) and oral administration of potassium iodide 10 gm daily for 7 days on pregnancy rates of cows with OC inseminated with frozen semen at fixed time 20±4 hours after the second GnRH treatment. Holstein Friesian crossbred cows had the highest prevalence (87.5%) of OC, a high proportion of affected cows were 5-6 year of age (37.5%) and in their third parity (40%). Overall a high proportion of treated cows became pregnant (47.5%) with the treatment with 35% becoming pregnant in the first and 12.5% becoming pregnant in the second insemination (in the subsequent estrus) following treatment. It was concluded that HF crossbred cows are most affected with ovarian cysts in the age group of 5-6 years and 3rd parity. Ovsynch plus progesterone injection along with oral feeding of potassium iodide coupled with fixed time insemination results in good pregnancy rates.

Keywords: Dairy cows, cystic ovaries, ovsynch, progesterone, KI, parity

Introduction
Ovarian cysts (OC) represent one of the most common reproductive disorders affecting dairy herd fertility mainly during the postpartum period (Silvia *et al*., 2005; Vanholder *et al*., 2006) [31, 33]. OC result in prolongation of the calving interval, reduced milk production, increased culling rates (Bartlett *et al*., 1986; Fourichon *et al*., 2000) [2, 10] with significant economic losses to the dairy farmer (Scott *et al*., 1997;) [29]. The incidence of OC ranges from 6 to 30% (Kesler and Graveric, 1982) [18] and can occur at any time during the lactation period, but the highest incidence rates have been reported before 60 days of lactation (Erb and White, 1998) [7] with a peak between 14 and 40 days postpartum.
OC are in fact large persistent anovulatory follicles present over the ovaries and are currently defined as follicle like structures that achieve a diameter of at least 17 mm or more, persisting for 6 or more days in the absence of a corpus luteum (CL) (Jeengar *et al*., 2014) [17]. Many studies have showed that OC are actually dynamic structures, which can regress and be replaced by new cysts (Yashioka *et al*., 1996) [35]. Follicular turnover in cows with OC takes 13 (Hampton *et al*., 2003) [13] to 19 (Todoroki *et al*., 2004) [32] days, whereas in clinically normal cows, it occurs every 8.5 days (Sirois and Fortune, 1988).
OC in dairy cows have been classified as follicular cyst and luteal cysts based on morphology, steroid secretion and clinical outcome (Farin *et al*., 1990; Purohit *et al*., 2001; Vanholder *et al*., 2006) [8, 24, 33]. The diagnosis and differentiation of the type of OC appear to be important and can usually be carried out by a combination of transrectal palpation, transrectal ultrasonography (TRUS) and plasma progesterone (P4) assay (Jeengar *et al*., 2014) [17]. The P4 concentration in cows with OC vary according to the type of OC. Cows having a P4 concentration of less than 1.0ng/ml were considered to have follicular cysts and those with concentrations of 1.0ng/ml or higher were regarded as the cases of luteal cyst or cystic corpus luteum (Halter *et al*., 2003; Nakao *et al*., 2003) [12].
The usual therapy suggested for cows with OC is the administration of either hCG, GnRH alone of followed by prostaglandin administration 8-10 days later (Purohit *et al*., 2001; Jeengar *et al*., 2014) [24, 17]. The administration of oral potassium iodide has also been suggested with diverse results (Purohit *et al*., 2001; Pushp *et al*., 2016) [24, 25]. The administration of Ovsynch protocol (Bartolome *et al*., 2000; Meena *et al*., 2017) [3, 20] and oral levothyroxine (Meena *et al*., 2017) [20] was also advocated. A major drawback with most therapies for OC is the re-establishment of fertility, which often requires longer time due to perturbations in endocrinology and uterine pathology that follows in long standing cases (Purohit, 2008) [23].

In the present study we examined the effect of Ovsynch plus progesterone injection plus oral potassium iodide treatment on pregnancy rates with fixed time artificial insemination in cows with OC.

Materials and methods

The present study was performed over the period from October 2019 to March 2021 on cows with ovarian cysts (OC) presented to the government veterinary polyclinic Bundi and cows belonging to farmers in nearby dairy farms Bundi. Cows with fluid filled or hard structures (>25 mm) on the ovaries on two transrectal examinations 10 days apart were considered to have OC as mentioned previously (Jeengar *et al*., 2014) [17]. The age of the cows, the associated clinical findings breed, and parity were recorded

Cows with OC (n=40) were treated with Ovsynch protocol + progesterone injection 750mg and oral feeding of potassium iodide for 7 days Briefly, GnRH (Buserelin acetate 40µg; MSD) and progesterone injection 750mg (Duraprogen 750mg; Vetcare) were administered IM on Day 0 with oral feeding of potassium iodide 10 gm daily for 7 days. Injection Cloprostenol (Repregna 500µg; Vet Mankind) was administered IM on Day 7 and GnRH (40µg) was given IM on Day 9.

All cows were bred by fixed time artificial insemination using frozen semen 20±4 hours after the second GnRH injection. Cows returning to estrus subsequently were re-inseminated. Cows not returning to estrus were examined for pregnancy at 60 days post insemination by transrectal palpation. The pregnancy rates were calculated.

Results

Grouping of cows with OC according to age revealed that out of total 40 cows 15, 14 and 11 cows were in the age group of 5-6 years, 6-7 years and greater than 7 years category. Thus the highest incidence (37.5%) of OC was recorded among cows with age 5-6 year followed by 6-7 years and greater than 7 years with 35%, 27.5% incidence respectively.

In the present study, HF crossbred cows were found to be more affected with OC with 87.5% incidence followed by non-descript cows with 12.5% incidence. Parity wise classification of cows with OC revealed 16, 14 and 10 cows in the 3rd, 4th and 5th parity respectively. Thus, the highest incidence of OC in the present study was found among cows of 3rd parity with 40% incidence followed by cows of 4th parity and 5th parity with 35%, 25% incidence respectively.

Clinical findings in cows with ovarian cysts in the present study were nymphomania (17.5%), mucometra (12.5%), sterility hump (5%), Short estrous cycle and long estrus period (2 to 4 days) (35%), endometritis (22.5%), adrenal virilism (masculine appearance) (5%) and prolonged anestrus (15%). Some cows were showing multiple symptoms such as nymphomania with mucometra, endometritis and sterility hump signs in combination.

Pregnancy rates of cows with ovarian cysts after treatment

The number of cows that conceived at first insemination after treatment with Ovsynch protocol + Progesterone + KI was 35% (14/40) whereas 12.5% (5/40) cows conceived at second insemination in the subsequent estrus. The overall pregnancy rates in treatment with Ovsynch protocol + Progesterone + KI were 47.5%.

Discussion

The incidence of OC ranges from 6 to 30% (Whitmore *et al*., 1974; Britt *et al*., 1977; Kesler and Graveric, 1982; Bartlett *et al*., 1986; Youngquist, 1986; Garverick, 1999) [34, 5, 18, 2, 36] and can occur at any time during the lactation period, but the highest incidence rates have been reported before 60 days of lactation (Erb and White, 1998) [7] and peaking between 14 and 40 days postpartum probably due to infections (Bosu and Peter, 1987) [4]. Incidence is more common in Holstein-Friesians than in other dairy breeds (Hardie and Ax, 1981) [14]. The occurrence is higher in high producing cows, usually 4 to 6 years of age (Roberts, 1986), in the second to fifth lactation and in winter months.

In the present study the incidence of ovarian cysts in cows was highest in cows between 5-6 years of age followed by cows in the age group of 6-7 years and lowest in the age group of ≥7 years. In several studies, more cysts were found in high producing cows as compared to low producing (Coleman, DIRM-25). While in some previous studies OC an increase in occurrence with age and parity was recorded (Nelson *et al*., 2010) [21]. This may be the result of other pathological and physiological conditions which are related to increasing parity, e.g. milk fever (Fleischer *et al*., 2001) [9]. Nosier *et al*., (2013) [22] found that the highest incidence of OC occur in the 3-5 year age group of Holstein cows.

For the clinical cases presented and analyzed in the present study cows were between 3rd to 5th parity. Cows in 3rd parity had an increased risk of being diagnosed with OC in the present study. Several studies reported that the increasing age was considered a significant risk for the development of OC in dairy cows (Laporte *et al*., 1994; Fleischer *et al*., 2001; Nelson *et al*., 2010) [9, 21].

The present study assessed whether an Ovsynch + Progesterone +KI based TAI protocol could be used as an efficient tool for the treatment of ovarian cysts in lactating dairy cows. It is probable that the combination of application of PGF2α on the 7th day and GnRH on the 9th day was more effective. According to Moreira *et al*. (2000), cows treated according to Ovsynch protocol respond to the treatment more intensively than treatment with PGF2 or GnRH separately. Moreover, the two types of cysts may be considered as different forms of the same disorder (Vanholder *et al*., 2006) [33]. In particular, luteal cysts are believed to be follicular cysts in later stages (Garverick, 1997). Interestingly, it has been reported that following treatment with GnRH, ovarian cysts may luteinize, but they never ovulate (Garverick, 1997). In addition, the use of GnRH to treat ovarian cysts showed the presence of a CL and the cystic structure 7 days after treatment (Bierschwal, 1966; Ambrose *et al*., 2004) [1] indicating that the CL formed from ovulation of an ovarian follicle, and not the existing ovarian cyst.

The overall pregnancy rates with the treatment Ovsynch protocol + Progesterone + KI 47.5% observed. Treatment with progesterone disrupt the endocrine environment and restores the hypothalamic sensitivity needed to maintain the ovarian cysts and thus lead to regression of OC. Exposure of hypothalamic unresponsive cows to exogenous P4 restore the ability of E2 to induce a surge-like release of LH (Guman *et al*., 2002; Halter *et al*., 2006) [12]. P4 resulted in the recruitment of a healthy new follicle (Ambrose *et al*., 2004) [1] by giving negative feed on LH secretion and prevent excessive growth of OC.

In terms of induction of normal estrus and pregnancy rates, Iodine supplementation increases the conception rate on first

estrus and reduces irregular breeding intervals because iodine may stimulate the thyroid activity which is low in cows with OC (Purohit, 2008; Pushp *et al*., 2016; Meena *et al*., 2017) [23, 25, 20]. Exposure of hypothalamic unresponsive cows to exogenous P4 restores the ability of E2 to induce a surge-like release of LH (Gumen *et al*., 2002; Halter *et al*., 2006) [12]. P4 resulted in the recruitment of a healthy new follicle (Ambrose *et al*., 2004) [1] by giving negative feed on LH secretion and prevent excessive growth of OC.

Conclusions

It was concluded that HF crossbred cows are most affected with ovarian cysts in the age group of 5-6 years and 3rd parity. Ovsynch plus progesterone injection along with oral feeding of potassium iodide coupled with fixed time insemination results in good pregnancy rates.

References

1. Ambrose DJ, Schinitt EJP, Lopes FL, Mattos RC, Thatcher WW. Ovarian and endocrine responses associated with the treatment of cystic ovarian follicles in dairy cows with gonadotropin releasing hormone and prostaglandin F 2", with or without exogenous progesterone. Can. Vet. J. 2004;45:931-937.
2. Bartlett PC, Ngategize PK, Kaneene JB, Kirk JH, Anderson SM, Mather EC. Cystic follicular disease in Michigan Holstein-Friesian cattle: Incidence, descriptive epidemiology and economic impact. Prev Vet Med. 1986;4:15-33.
3. Bartolome JA, Archbald LF, Morresey P, Hernandez J, Tran T, Kelbert D, *et al*. Comparison of synchronization of ovulation and induction of estrus as therapeutic strategies for bovine ovarian cysts in the dairy cow. Theriogenology. 2000;53:815-825.
4. Bosu WTK, Peter AT. Evidence for a role of intrauterine infections in the pathogenesis of cystic ovaries in postpartum dairy cows. Theriogenology. 1987;28(5):725-736.
5. Britt JH, Harrison DS, Morrow DA. Frequency of ovarian follicular cysts, reasons for culling, and fertility in HolsteinFriesian cows given gonadotropin-releasing hormone at two weeks after parturition. Am J Vet Res. 1977;38(6):749-751.
6. Coleman DA. Cystic ovarian disease. http://spotidoc.com/doc/135606/ dairy-irm-25--cystic-ovarian-disease.
7. Erb HN, White ME. Incidence rates of cystic follicles in Holstein cows according to 15-day and 30-day intervals. Cornell Vet. 1998;71:326-331.
8. Farin PW, Youngquist RS, Parfet JR, Garverick HA. Diagnosis of luteal and follicular ovarian cysts by palpation per rectum and linear-array ultrasonography in dairy cows. J Am Vet Med Assoc. 1992;200:1085-1089.
9. Fleischer P, Metzner M, Beyerbach M, Hoedemaker M, Klee W. (). The relationship between milk yield and the incidence of some diseases in dairy cows. J Dairy Sci. 2001;84:2025-2035.
10. Fourichon C, Seegers H, Malher X. Effect of disease on reproduction in the dairy cow: a meta-analysis. Theriogenology. 2000;53:1729-1759.
11. Gumen A, Sartori R, Costa FMJ, Wiltbank MC. A GnRH/LH surge without subsequent progesterone exposure can induce development of follicular cysts. J Dairy Sci. 2002;85:43-50.
12. Halter TB, Hayes SH, Anderson LH, Silvia WJ. Effect of a single injection of progesterone on ovarian follicular cyst in lactating dairy cows. Vet J. 2006;172:329-333.
13. Hampton JH, Salfen BE, Bader JF, Keisler DH, Garverick HA. Ovarian follicular response to high doses of pulsitile luteinizing hormone in lactating dairy cattle. J Dairy Sci. 2003;86:1963-1969.
14. Hardie AR, Ax RL. A 40-year survey of cystic ovaries in dairy cows. J Dairy Sci. 1981;64(1):149.
15. Hatler TB, Hayes SH, Laranja da Fonseca LF, Silvia WJ. Relationship between endogenous progesterone and follicular dynamics in lactating dairy cows with ovarian follicular cysts. Biol Reprod. 2003;69:218-223.
16. Huszenicza GY, Kulcsarm M, Rudas P. Clinical endocrinology of thyroid gland function in ruminants. Vet Med Czech. 2002;47(7):199-210.
17. Jeengar K, Chaudhary V, Kumar A, Raiya S, Gaur M, Purohit GN. Ovarian cysts in dairy cows: old and new concepts for definition, diagnosis and therapy. Ani Reprod. 2014;11(2):63-73.
18. Kesler DJ, Garverick HA. Ovarian cysts in dairy cattle. J Ani Sci. 1982;55 (5):1147-1159.
19. Laporte HM, Hogeveen H, Schukken YH, Noordhuizen JPTM. Cystic ovarian disease in Dutch dairy cattle, I. Incidence, risk factors and consequences. Livestock Prod Sci. 1994;38(3):191-197.
20. Meena M, Purohit GN, Kumar D, Saraswat CS. Thyroidal and progesterone hormones in cows with ovarian cysts and effects of therapy with levothyroxine, KI, GnRH and progesterone or Ovsynch. Adv. Anim. Vet. Sci. 2017;5(12):514-519.
21. Nelson ST, Martin AD, Osteras O. Risk factors associated with cystic ovarian disease in Norwegian dairy cattle. Acta Veterinaria Scandinavica. 2010;52:60.
22. Noseir WMB, Metwally KK, Negm NS. Using double dose of GnRH for reducing incidence of cystic ovaries in cows. Alexandria J Vet Sci. 2013;39:124-132.
23. Purohit GN. Recent developments in the diagnosis and therapy of repeat breeding cows and buffaloes. CAB Rev. Persp. Agric. Vet. Sci. Nutr. Nat. Res. 2008;3(062):1-34. https:// doi.org/10.1079/PAVSNNR20083062 •
24. Purohit GN, Joshi BK, Bishnoi BL, Gupta AK, Joshi RK, Vyas SK, *et al*. Cystic ovarian disease in Rathi Cattle. Ann Arid Zone. 2001;40:199-202.
25. Pushp M, Purohit GN, Kumar S. Serum cortisol in dairy cattle with ovarian cysts and the successful treatment of cysts with GnRH plus potassium iodide. Indian J. Anim. Reprod. 2016;37(2):48-49.
26. Ribadu AY, Nakada K, Moriyoshi M, Zhang WC, Tanaka Y, Nakao T. The role of LH pulse frequency in ACTH-induced ovarian follicular cysts in heifers; Ani Reprod Sci. 2000;64:21-31.
27. Roberts SJ. Infertility in the cow. In: Veterinary Obstetrics and Genital Diseases: Theriogenology. 3rd ed., Vermont: Woodstock, 1986, pp 421-433.
28. Roberts SJ. Veterinary Obstetrics and Genital Diseases 2nd Edn., Comstock, Ithaca, New York, 1971.
29. Scott SJ, Dobson H. Postmortem comparison of ultrasonography, endocrine measurements and histology of large abnormal follicles in cows. Vet Rec. 1997;140:654-656.
30. Silva AM, Moreira RJC, Fernandes CAC, Palhao MP, Gioso MM, Neves JP. Treatment of ovarian cysts in cattle with lecirelin acetate. Ani Reprod. 2012;9:591.

31. Silvia WJ, McGinnis AS, Hatler TB. A comparison of adrenal gland function in lactating dairy cows with or without ovarian follicular cysts. Boil Reprod. 2005;5(1):19-29.
32. Todoroki J, Noguchi J, Kikuchi K, Ohnuma K, Ozawa M, Kaneko H. Plasma concentrations of inhibin A in cattle with follicular cysts: relationships with turnover of follicular waves and plasma levels of gonadotropins and steroid hormones. Domest Ani; Endocrinol. 2004;27:333-344.
33. Vanholder T, Opsomer G, Kruif AD. Aetiology and pathogenesis of cystic ovarian follicles in dairy cattle: a review Reprod. Nutr. Dev. 2006;46:105-119.
34. Whitmore HL, Tyler WJ, Casida LE. Incidence of cystic ovaries in Holstein-Friesian cows. J Am Vet Med Assoc. 1974;165:693-694.
35. Yoshioka K, Iwamura S, Kamomae H. Ultrasonic observations on the turnover of ovarian follicular cysts and associated changes of plasma LH, FSH, progesterone and estradiol-17β in cows. Res Vet Sci. 1996;61:240-244.
36. Youngquist RS. Cystic follicular degeneration in the cow. In: D. A. Morrow (Ed.) Current Therapy in Theriogenology, 1986, pp. 243-246. W.B. Saunders Co; Philadelphia.
37. Zemjanis R. In Diagnostic and Therapeutic Techniques in Animal Reproduction. 2nd ed. The Williams and Wilkins Co., Baltimore, MD. 1970, p. 67.