SERUM CORTISOL IN DAIRY CATTLE WITH OVARIAN CYST AND THE SUCCESSFUL TREATMENT OF CYST WITH GnRH PLUS POTASSIUM IODIDE

M.K. PUSHP[1]*, G.N. PUROHIT[2] AND S. KUMAR[3]

Department of Veterinary Gynaecology and Obstetrics
Rajasthan University of Veterinary and Animal Sciences, Bikaner - 334 001

Received: 11.05.2016 Accepted: 09.06.2016

ABSTRACT

Dairy cattle having ovarian cysts (n=40) were randomly treated with GnRH analogue (40 µg, i.m.), potassium iodide (KI, 10 g for 5 days, p.o.), GnRH analogue + KI or Ovsynch protocol. The maximum cyst disappearance and presence of a luteal mass 7 days post-treatment was observed following treatment with GnRH analogue + oral KI (80%) or GnRH analogue (70%), followed by ovsynch (50%), whereas KI therapy was ineffective. Plasma cortisol in dairy cattle with ovarian cysts was similar before and after treatment. In brief, plasma cortisol remained similar during pre- and post-treatment period in cattle displaying ovarian cyst and the ovarian cyst can be best treated with GnRH plus KI treatment.

Keywords: Cattle, Cortisol, GnRH, Ovarian cysts, Potassium iodide

Ovarian cysts are one of the important causes of infertility in a high proportion (9.5-25%) of dairy cattle, thus extending their inter-calving periods (Whitmore *et al*., 1974 and Bartlett *et al.,* 1986). Ovarian cysts usually develop in response to stress such as high production (Dekhordi *et al*., 2015). Various therapeutic options for ovarian cysts have been reviewed (Jeengar *et al*., 2014) and GnRH treatment was regarded as the most common therapy (Purohit *et al*., 2001). Others suggested that oral feeding of potassium iodide is an effective therapy for ovarian cyst (Kumar and Yadav, 2004). The present study examined serum cortisol in dairy cattle with ovarian cyst as well as some therapeutic options was tried.

Holstein Friesian crossbred and non-descript dairy cattle were considered for the study (n=40) when the palpable structure on either of the ovarian surface was >25 mm at two examinations at 10 day interval. At the time of second examination, cattle were given rest for a period of an hour before the collection of blood in pre-sterilized centrifuge tubes and serum was separated and stored at -20°C till cortisol analysis using solid phase enzyme immuno-assay kits (DIALAB Wiener, Austria). Dairy cattle with ovarian cysts were randomly and equally divided for subjecting to treatment using either a single shot of GnRH analogue (Buserelin acetate 40 µg, i.m.), potassium iodide (KI, 10 g per day for 5 days, p.o.), GnRH analogue + KI or ovsynch protocol (day 0 and day 9, GnRH analogue 40 µg; day 7 cloprostenol 500 µg; i.m.) and an untreated group. About 7 day after the end of treatment, jugular vein blood was again collected and dairy cattle were examined for the disappearance of cysts and the presence of a luteal structure. The number of dairy cattle that showed normal estrus after therapy were recorded. The data was analysed using conventional statistical procedures.

Pre-treatment serum cortisol in dairy cattle with ovarian cysts and subjected to GnRH, KI, GnRH+KI, ovsynch or no treatment was similar (1.06±0.16, 1.15±0.17, 1.41±0.30, 1.50±0.28 and 1.06±0.30 µg/dl, respectively; p>0.05). Furthermore, their post-treatment serum cortisol remained similar in different groups (p>0.05). These serum cortisol concentrations within the physiological range reflected that basal adrenal activity is not related to ovarian cyst formation (Silvia *et al.,* 2005). In a previous study, higher cortisol

[1,3]M.V.Sc Scholar, [2]Professor; *dr.muneshpushp@gmail.com

was recorded in cattle with ovarian cyst in comparison to cattle without ovarian cyst (Dekhordi *et al*., 2015), however, serum cortisol were not evaluated in dairy cattle without ovarian cysts in the present study.

Dairy cattle exhibiting normal estrus following GnRH, KI, GnRH+KI or ovsynch treatment were five, zero, seven and five, respectively. In addition, dairy cattle that evidenced a luteinized mass on day 7 post-treatment were 70%, 0%, 80% and 50%, respectively in GnRH, KI, GnRH+KI and ovsynch group, respectively. Some authors have reported 80 - 95% success rate with GnRH alone (Garverick, 1997 and Rudowska *et al.,* 2015). In the present study, the best treatment option appeared to be administration of GnRH along with KI feeding, thus suggesting some role of KI in ovarian cyst treatment. Probably, the feeding of KI helped in restoration of normal thyroid activity as the altered thyroid status was reported in dairy cattle with ovarian cysts (Mutinati *et al*., 2013).

In brief, serum cortisol remained similar during pre- and post-treatment period in dairy cattle with ovarian cyst, and GnRH administration along with potassium iodide feeding was adjudged as the best treatment option.

REFERENCES

Bartlett, P.C., Ngategize, P.K., Kaneene, J.B., Kirk, J.H., Anderson, S.M. and Mather, E.C. (1986). Cystic follicular disease in Michigan Holstein Friesian cattle: incidence, descriptive epidemiology and economic impact. *Prev. Vet. Med.,* **4**: 15-33.

Dekhordi, J.A., Mirshokraei, P. and Dehghani, A. (2015). Metabolic profiles of high-yielding dairy cows with ovarian cysts. *Iranian J. Vet. Med*., **9**: 241-248.

Garverick, H.A. (1997). Ovarian follicular cyst in dairy cows. *J. Dairy Sci.,* **80**: 995-1004.

Jeengar, K., Chaudhary, V., Kumar, A., Raiya, S., Gaur, M. and Purohit, G.N. (2014). Ovarian cysts in dairy cows: old and new concepts for definition, diagnosis and therapy. *Anim. Reprod.,* **11**(2): 63-73.

Kumar, H. and Yadav, M.C. (2004). Cystic ovarian degeneration in cattle- control through hormonal manipulation. *Intas Polivet*, **5**: 169-172.

Mutinati, M., Rizzo, A. and Sciorsci, R.L. (2013). Cystic ovarian follicles and thyroid activity in the dairy cow. *Anim. Reprod. Sci.,* **38**: 150-154.

Purohit, G.N., Joshi, B.K., Bishnoi, B.L., Gupta, A.K., Joshi, R.K., Vyas, S.K., Gupta, K.A., Pareek, P.K. and Sharma, S.S. (2001). Cystic ovarian disease in Rathi cattle. *Annals Arid Zone*, **40**: 199-202.

Rudowska, M., Barański, W., Socha, P., Zduńczyk, S. and Janowski, T. (2015). Treatment of ovarian cysts in dairy cows with simultaneous administration of GnRH and PGF2α has no clear advantage over the use of GnRH alone. *Bulletin Vet. Institute Pulawy,* **59**(1): 107-113.

Silvia, J.W., McGinnis, A.S. and Hatler, T.B. (2005). A comparison of adrenal gland function in lactating dairy cows with or without ovarian follicular cysts. *Reprod. Biol*., **5**(1): 19-29.

Whitmore, H.L., Tyler, W.J. and Casida, L.E. (1974). Incidence of cystic ovaries in Holstein**-**Friesian cows. *J. Am. Vet. Med. Assoc.,* **165**: 693-694.