OCCURRENCE AND PATHOLOGY OF VARIOUS CONDITIONS OF OVARY IN FEMALE GENITAL TRACT OF CATTLE

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ABSTRACT

The present investigation was carried out from May 2009 to October 2009. During this period a total number of 390 samples of female genital tract were examined from cattle of different age and breeds. Out of these 55 samples showing gross lesions were collected and tissue sections from these were subjected to histopathological examination. The overall occurrence of various pathological conditions affecting the female genital tract of cattle was observed as 40 per cent. Ovary revealed pathological conditions in 35.25% cases as : oophoritis 3.20%, follicular cyst 9.61%, cystic corpus luteum 0.64%, granulosa cell tumour 1.92%, persistent corpus luteum 3.84%, parovarian cyst 1.28%, hypoplasia 0.64%, ovarobursal adhesion 3.20%, subactive ovary 2.56%, sclerosed ovary 3.20%, follicular atresia 2.56%, anovular cords 1.28%, folliculoids 0.64%, haemorrhage 0.64% cases.

***Key words*:** Cattle, ovary, cyst, pathological conditions

Introduction

India is an agriculture dependent country and rearing of livestock is subsidiary to agriculture. Animals are the back bone of agriculture economy of our country. The cattle husbandry and dairying is an important thrush to rural economy in this arid region of Rajasthan. The population of cattle in Rajasthan is 12.41 million according to 18th Indian Livestock census, 2007. Cattle are prone to various infectious and non-infectious diseases which leads to drop in production and economy. Histomorphological lesions in genital organs with or without apparent gross lesions lead to disturbances in reproductive cycle and disturbed cycle results in a large proportion of failure of conception and are an important cause of sterility. The conditions of ovary include oophoritis, cystic ovarian disease, neoplasm and other conditions like atretic follicles, hypoplasia, folliculoids, granulosa cell tumour etc. Cystic ovarian disease is the most important reproductive disorder responsible for abnormal oestrus behaviour and infertility. In Rajasthan, so far very little efforts have been made to study the etiology, occurrence and pathology of various lesions in genital tract of cattle. Therefore, it becomes pertinent to study the genital tract affections in cattle.

Materials and Methods

The specimens of organs of female genital tract of cattle for the proposed investigation were collected from the carcasses of cattle irrespective of age and breeds. For the present investigation, a total number of 390 specimens of female genital tract of cattle were collected from various municipal areas of Bikaner, Jodhpur, Kota districts irrespective of age and breeds. The samples were also collected from the carcasses submitted to the Department of Veterinary Pathology, College of Veterinary and Animal Science, Bikaner for routine post-mortem examination. During post-mortem examination, the samples were thoroughly examined visually and manually for various pathological abnormalities such as colour, consistency, shape and size, presence of tumours etc. The study was conducted from May to October 2009. For histopathology the fixed tissues were processed mechanically for paraffin embedding by acetone and benzene technique (Lillie, 1965). The sections of 4-6 micron thickness were cut and stained with routine hematoxylin and eosin staining method. As far as possible, results were recorded by gross observations and photomicrographs.

Results and Discussion

Out of these 390 specimens, 55 specimens suspected for abnormalities were further processed for histopathological examination which revealed several overlapping conditions. These genital tracts were examined grossly and 55 selected organs were preserved in 10% formalin and finely submitted to histopathology. All organs revealed several overlapping conditions, may be of hormonal as well as infectious origin.

In the present study, various kinds of affections were recorded in ovary to the extent of 35.25 per cent. The present incidence was slightly higher than the observations of Mukherjee (1980) as 30.50 per cent. However, in available literature this incidence varied from 4.41 per cent (Rao and Rajya, 1976b) to 41 per cent (Narnaware *et al.,* 2009). The percentage incidence of ovarian abnormalities was towards the higher due to diseases, poor nutrition, inadequate herd management, anatomical deformity of the genital tract, hereditary, hormonal disturbances or environmental changes, makes the animal infertile.

In present study 3.20 per cent cases of oophoritis were recorded, while Mukherjee (1980) reported 3.80 per cent cases of necrotic oophoritis and Sharma *et al.* (1993) reported 3.33 per cent incidence of oophoritis. Oophoritis was identified

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histologically, as diffuse infiltration of lymphocytes in the medulla and perivascular lymphocytic infiltration in the hilar region. Similar observations were described by Summer and Campbell (1974) and Azab *et al.* (2006).

Cystic ovaries might be due to substances, such as phytoestrogens, that may reduce fertility. Feeding of cows for prolonged periods on clover, lucerne (alfalfa) or other plants rich in phytoestrogens may lead to cystic ovaries.

A follicular cyst was recorded in 9.61 per cent cases. Similar observations were recorded by Mukherjee (1980) as 9.60 per cent. The most widely accepted theory of the origin of cystic ovarian disease is that, there is aberration of the preovulatory surge of luteinizing hormone, either the absence of the surge or mistiming of the surge, which cause the disease. There is clearly a genetic predisposition also to the disease in certain families (Jubb *et al.,* 2007).

Cystic corpus luteum was observed in 0.64 per cent cases. Slightly higher incidence of 0.80 per cent was recorded by Nair and Raja (1974). However in available literature this incidence varied from 0.17 per cent (Shalash, 1958) to 11.11 per cent (Wahid *et al.,* 1991). These cysts represent an abnormal accumulation of fluid at the centre of corpus luteum, where a small fluid containing cavity is normal. Nothing can be said about their cause although this could be conceivably being some accidental insufficiency of blood supply (Jones *et al.*, 1997).

Granulosa cell tumor was recorded in 1.92 per cent cases. Higher incidence was recorded by Mukherjee (1980) as 5.70 per cent. Two cases of granulosa cell tumor was reported by Wahid *et al.* (1991). A small spherical eosinophilic mass, so called call-exner body, lies in the center of the rosette. Tumor was lined by granulosa cells, which were surrounded by thecal cells. Similar findings were recorded by Jones *et al.* (1997) and Jubb *et al.* (2007).

Persistent corpus luteum was observed in 3.84 per cent cases, which was slightly lower than the incidence reported by Sujata (2000) in 4.00 per cent cases. Lower incidence was reported by Rao and Rajya (1976b) in 0.16 per cent. These findings are same as described by Dwivedi and Singh (1971). Present findings indicated that persistence of corpora lutea in these cases might be due to lack of diminished secretion of luteolytic substance by the uterus as suggested by McDonald (1975).

Parovarian cyst was recorded in 1.28 per cent cases, almost same incidence was reported by Rao and Rajya (1976b) as 1.09 per cent cases. However, in available literature incidence of parovarian cyst varied from 1.09 per cent (Rao and Rajya, 1976b) to 6.5 per cent (Narnaware *et al.*, 2009).

Hypoplasia was seen in 0.64 per cent case, which was closely related to the incidence reported by Khan (1970) as 0.66 per cent cases. However, reported literature about incidence of hypoplasia of ovary varied from 0.08 per cent (Rao and Rajya, 1976b) to 1.50 per cent (Sujata, 2000).

Ovarobursal adhesion was seen in 3.20 per cent cases. Higher incidence recorded by Fathalla *et al.* (2000) as 8 per cent. Ovarobursal adhesions were probably due to breeding and postpartum complications. Many factors contribute to the predisposition of the reproductive tracts to infections during these periods (Fathalla *et al.*, 2000).

Subactive ovary was seen in 2.56 per cent cases which was similar to Shalash (1958) as 2.64 per cent cases. Higher incidence was recorded by Khan (1970) as 12.34 per cent. The subactive ovaries were due to the low level of thyrotropic hormone in blood, diminished release of gonadotrophin and malnutrition specially the deficiency of vitamin A, mineral and trace elements in the ration (Dwivedi and Singh, 1971).

Sclerosed ovary was recorded in 3.20 per cent cases, which was slightly lower than those reported by Mukherjee (1980) as 3.80 per cent cases. This condition could be due to hypofunction of thyroid by low blood levels of thyrotropic hormone. Nutritional error might have a significant role in production of disease (Sastry and Rao, 2005).

Follicular atresia was observed in 2.56 per cent cases, which was closely related to the incidence reported by Sujata (2000) as 2.50 per cent cases. Formation of atretic follicles may be due to malnutrition and possibly iodine deficiency were the causes of follicular atresia in an estrous animals (Rahman *et al.*, 1977).

Anovular cords was recorded in 1.28 per cent cases, which was slightly higher than the incidence reported by Rao and Rajya (1976b) as 1.05 per cent cases. These anovular cords and follicles were associated with hypoplastic ovaries. Similar correlation was suggested by Sastry and Rao (2005).

Folliculoids was observed in 0.64 per cent case, which was slightly higher than those reported by Rao and Rajya (1976b) as 0.15 per cent cases. These folliculoids were associated with anovular cords.

Haemorrhage was recorded in 0.64 per cent case, which was higher than those reported by Rao and Rajya (1976b) as 0.09 per cent cases. It may be due to bacterial infection, such as *Salmonella pullorum*, mechanical and toxic conditions (Cohrs, 1967).

References

Azab, A.S. *et al.* (2006) *Assiut. Vet. Med. J*. **52**(109): 331-342.

Census (2007) *18th Indian Live Stock Census*. www. FAO. org. in

Cohrs, P. (1967) *Textbook of the special pathological Anatomy of domestic animals*. 1st English ed. Pergamon Press, London.

Dwivedi, J.N. and Singh, C.M. (1971) *Indian J. Ani. Hlth.* **10**: 27-36.

Fathalla, M. *et al.* (2000) *Israel J. Vet. Med.* **55**: 83-87.

Jones, T.C. *et al.* (1997) *Veterinary pathology*. 6th ed. Williams and Wilkins, Baltimore.

Jubb, K.V.F. *et al.* (2007) *Pathology of domestic animals*. Vol 3, 5th ed. Academic Press, Inc. California.

Khan, B.U. (1970) *J. Remount Vet. Corps.* **9**: 2-8. (Vet. Bull. 1971, **41**: 430).

Lillie, R.O. (1965) *Histopathologic technique and practical histochemistry*. New York and London: McGraw Hill Book Co.

Mc-Donald, L.E. (1975) *Veterinary Endocrinology and Reproduction*. 2nd ed. Lea and Febiger, Philadelphia.

Mukherjee, S.C. (1980) *Indian J. Vet. Pathol.* **4**: 66-67.

Nair, K.P. and Raja, C.K.S.V. (1974) *Kerala J. Vet. Sci.* **5**: 82-97. (Vet. Bull. 1975, **45**: 3979).

Narnaware, S.D. *et al.* (2009) *Indian Vet. J.* **86**: 127-128.

Rahman, M.H. *et al.* (1977) *Indian Vet. J.* **54**: 389-391.

Rao, P. and Rajya, B.S. (1976b) *Indian J. Ani. Sci.* **46**: 125-130.

Sastry, G. A. and Rao, P.R. (2005) *Veterinary Pathology*. 7th ed. C.B.S. Publishers and Distributors, Shardara, Delhi (India).

Table 1: Incidence of various pathological conditions of ovary in female genital tract in cattle

S. No.	Name of condition	No. of cases	Percentage
1.	**OVARY**	**55**	**35.25**
1.1	Inflammatory condition	5	3.20
1.1.1	Oophoritis	5	3.20
1.2	Cystic ovaries	16	10.25
1.2.1	Follicular cyst	15	9.61
1.2.2	Cystic corpus luteum	1	0.64
1.3	Neoplasm	3	1.92
1.3.1	Granulosa cell tumour	3	1.92
1.4	Miscellaneous conditions	31	19.87
1.4.1	Persistent corpus luteum	6	3.84
1.4.2	Parovarian cyst	2	1.28
1.4.3	Hypoplasia	1	0.64
1.4.4	Ovarobursal adhesion	5	3.20
1.4.5	Subactive ovary	4	2.56
1.4.6	Sclerosed ovary	5	3.20
1.4.7	Follicular atresia	4	2.56
1.4.8	Anovular cords	2	1.28
1.4.9	Folliculoids	1	0.64
1.4.10	Haemorrhage	1	0.64

Shalash, M.R. (1958) *Vet. Rec.* **70**: 1225-1226.
Sharma, V.K. *et al.* (1993) *Indian Vet. J.* **70**: 1165-1167.
Sujata (2000) *Indian J. Vet. Pathol.* **24**:150.
Summer, P.M. and Campbell, R.S.F. (1974) *Res. Vet. Sci.* **17**: 131-133.
Wahid, M. M. *et al.* (1991) *Int. J. Ani. Sci.* **6**: 72-78. (Vet. Bull 1991, **61**: 6673).