

BIO-HISTOPATHOLOGICAL FEATURES OF ENDOMETRIUM IN REPEAT-BREEDER NILI-RAVI BUFFALOES

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ABSTRACT

Uterine endometrial biopsies of 15 repeat-breeder buffaloes were studied for histopathological changes. Denudation of endometrial epithelium, oedema of connective tissue and scanty uterine glands in the endometrium were observed. The more severe change exhibited was fibro-necrotic endometrium along with mononuclear infiltration of varying degree. At some places the lumen of the uterine glands were dilated containing cellular exudate. Arteriosclerosis was also recorded.

INTRODUCTION

Palpation of the genital organs through rectum shows no clear evidence of existing inflammation, or certain pathology in repeat-breeder animals, therefore, endometrial biopsy for histopathological studies are necessary (Casida, 1961). In the literature, histopathological findings of endometrium of repeat-breeder buffaloes and cows varied from mild to complete necrosis of the endometrial glands and stroma, and its replacement by fibrous connective tissue (Deeb *et al.*, 1976; Singh *et al.*, 1983a). These conditions renders the animal infertile or sterile. However, such information in Nili-Ravi buffaloes is sparse. This paper describes bio-histopathological changes in the endometrium of repeat-breeder Nili-Ravi buffaloes.

MATERIALS AND METHODS

This study was carried out on 200 Nili-Ravi buffaloes those brought for artificial insemination in the clinic of Department of Animal Reproduction, University of Agriculture, Faisalabad. Of these, 31 (15.5 %) exhibited repeat-breeding. Uterine biopsies, comprised of body of the uterus and uterine horns including caruncular and intercaruncular areas, were taken with the help of a biopsy punch from 15 repeat-breeder buffaloes. Tissues were fixed in Bouin's solution for at least 24 hours. These tissues were dehydrated in ascending grades of ethyl alcohol, cleared in xylene and paraffin sections of 5-6 μ were cut and stained with Harris haematoxylin and eosin (H & E) stain for histopathological studies (Humason, 1972).

RESULTS

Bio-histopathological sections, prepared from endometrial biopsies of repeat-breeder buffaloes exhibited denudation of endometrial epithelium from most of the parts. Biopsies taken from the uterine bodies showed oedema of connective tissues, hyperplastic smooth muscles, few inflammatory cells and endometrium having atrophied uterine glands (Plate 1).

Biopsies taken from the uterine horns showed inflammatory and necrotic changes. In few sections, stratum functionalis featured infiltration of neutrophils in the lamina propria, interglandular lamina propria as well as in uterine glands (Plate 2). Lymphocytic aggregation and infiltration and proliferation of fibrous connective tissue were observed. Lumen of the glands were dilated containing cellular infiltration. Interglandular lamina propria showed oedema and glandular epithelial necrosis at certain areas in most of the sections. Arteriosclerosis was an other feature recorded in endometrial biopsies from repeat-breeder buffaloes.

DISCUSSION

Since endometrial lesions could not be assessed with confidence by rectal palpation, therefore, biopsy study is an essential for best possible diagnosis, prognosis and rational treatment of repeat-breeder animals (Singh *et al.*, 1983a).

Mild endometritis to severe fibro-necrotic alterations were observed in the endometrium of repeat-

breeder buffaloes in the present study. It is a well known fact that inflamed endometrium is unfavourable for the implantation of the fertilized ova, thus it results in repeat-breeding (El-Naggar and El-Sherry, 1974). The inflammatory changes of the endometrium associated with repeat-breeding in cows and buffaloes had been also reported by Hartigan *et al.* (1972), Zafracas (1976), Deeb *et al.* (1976) and Javed and Khan (1991).

In acute inflammatory conditions of endometrium, special attention should be paid to differentiate changes occurring in the stroma in the oestrus cycle. Polymorphonuclear leukocytosis is a physiological finding occurring during oestrus under the influence of oestrogen (El-Naggar and El-Sherry, 1974). However, endometritis can be diagnosed in the endometrial biopsies by the presence of lymphocyte and plasma cells. In the present study at few places in lamina propria, lymphocytic aggregation and plasma cells were observed, indicated that repeat-breeder buffaloes were suffering from endometritis. In some severe cases of endometritis, cellular infiltration was also observed in lumen of endometrial glands and in the zona compactum. Such findings have also been reported by Singh *et al.* (1983 a & b). These inflammatory changes could be due to presence of pathogenic microorganisms or their toxins/endotoxins. In the endometrial biopsies, possibility of pathogenic microorganisms or their toxins/endotoxins is there because at the same station correlation of endometritis with microorganisms has already been reported in cows (Javed and Khan, 1991), however, isolation of microorganisms was not carried out in the present study.

A consistent feature observed in most of the endometrial biopsies of repeat-breeder buffaloes in the present study was oedema of connective tissue in the lamina propria, interglandular lamina propria and zona compactum. Atrophy of uterine glands and even necrosis was also observed. According to Jones and Hunt (1983), the cause of this phenomenon is failure of ionic pump mechanism. As a result of injury, accumulation of sodium, calcium and water into the cell results in swelling and rupture of cell. It is hypothesized that these all events occurred in case of repeat-breeder buffaloes under study (Coster, 1977). Chatterjee *et al.* (1979) also observed such changes in the biopsies of endometrium from repeat-breeder cow/buffaloes.

An other event which might have lead to necrosis of endometrial stroma in repeat-breeder buffaloes was arteriosclerosis (Deeb *et al.*, 1976; Chatterjee *et al.*, 1979; Samad and Ali, 1989) which featured connective tissue proliferation, collagen deposition in the walls of blood vessels along with lipids (cholesterol, fatty acids,

triglycerides and phospholipid). This lipid deposition, also explains high concentration of cholesterol in the serum of repeat-breeder buffaloes observed in the present study reported else where (Shahzada *et al.*, 1996). Deposition of lipids caused narrowing of arterial lumen persuaded into reduced/complete blockage of blood supply, which resulted in necrosis.

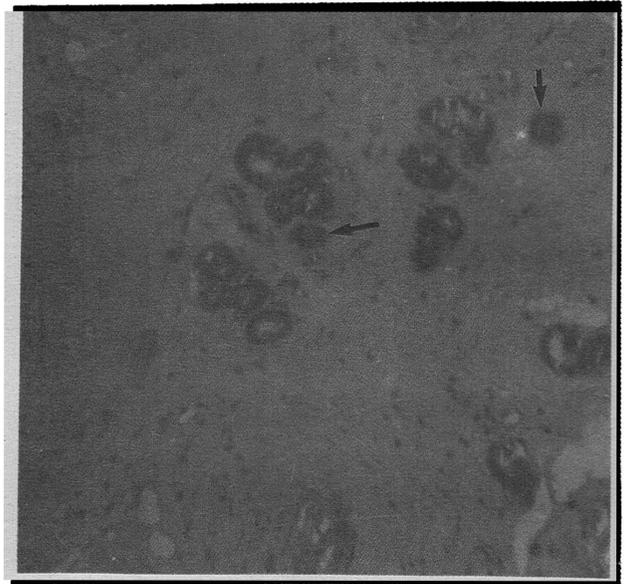


Plate 1: Atrophied uterine glands (arrows) and oedema of connective tissues in endometrium of a repeat-breeder buffalo.



Plate 2: Cellular debris in the lumen of the uterine glands (arrow) and some of the glands showing degeneration of the glandular epithelium in a repeat-breeder buffalo.

REFERENCES

- Casida, L.E., 1961. Present status of the repeat breeder cow problem. *J. Dairy Sci.*, 44 : 2323.
- Chatterjee, S.K., N.P. Singh and V.B. Singh, 1979. Spontaneous endometrial lesions in adult repeat breeder buffalo-cows (*Bubalus bubalis*). *Indian J. Anim. Res.*, 13: 103-106.
- Coster, R.D.E., 1977. Histological study of non-specific infectious endometritis in cows. *Annales de Medecine Veterinaire*, 121: 491-501.
- Deeb, S., M.N. El-Hriri and K. Zaki, 1976. Studies on repeat breeder cows and buffalo cows histopathology of the uterus by the aid of biopsy technique. *J. Egypt. Vet. Med. Assoc.*, 36 : 207-220.
- El-Naggar, M.A. and M.I. El-Sherry, 1974. Incidence and pathological changes in the endometrial biopsy of the repeat breeder buffaloes in Assiut province Egypt. *Assiut Vet. Med. J.*, 1 : 267-279.
- Hartigan, P.J., J.A. Murphy, W.R. Nunn and J.F.T. Griffin, 1972. An investigation into the causes of reproductive failure in dairy cows. Intrauterine infection and endometrial histopathology in clinically normal-repeat breeder cows. *Irish Vet. J.*, 26: 245-247.
- Humason, G.L., 1972. *Animal Tissue Technique*. 3rd Ed., W.H. Freeman and Company, San Francisco.
- Javed, M. T. and M. Z. Khan, 1991. Bacteriological and bio-histopathological studies in repeat-breeding cows. *J. Islamic Acad. Sci.*, 4: 242-244.
- Jones, T.C. and R.D. Hunt, 1983. *Veterinary Pathology*. 5th Ed. Lea and Febiger, Philadelphia.
- Samad, H. A. and C.S. Ali, 1989. Clinical and bio-histopathological studies in endometrial and repeat breeding Nili-Ravi buffaloes (*Bubalus bubalis*). *Pakistan Vet. J.*, 9: 198-199.
- Shahzada, N., A. Khan, M. Ahmad and N. Ahmad, 1996. Repeat-breeding in Nili-Ravi buffaloes: Prevalence, haematology and serum bio-chemistry. *Proc. 2nd Asian Buff. Assoc. Cong.*, Manila, Philippines, 9-12 October, 1996, pp: 402-407.
- Singh, R.B., R.D. Sharma, N.E.M. Singh and G.B. Singh, 1983a. Bio-histopathological studies of endometrium in repeat breeding buffaloes. *Theriogenology*, 19: 151-157.
- Singh, A.K., J.M. Nigam and D.N. Sharma, 1983b. Histological observations on endometrial glands of cows and buffaloes in relation to fertility. *Tropical Vet. & Anim. Sci. Res.*, 1 : 37-41.
- Zafracas, A.M., 1976. Diagnosis of endometritis in cattle by uterine biopsy. *Proc. 20th World Vet. Cong.*, Thessaloniki, Greece, 3: 1966-1972.