HISTOCHEMICAL STUDY OF BULBOURETHRAL GLANDS IN UNCASTRATED AND CASTRATED CATTLE

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ABSTRACT

For the present study bulbourethral glands were obtained from 28 castrated and uncastrated cattle of Deoni breed and other non-descript breeds. The glycogen activity was intensely positive, acid mucopolysaccharides and amyloid reaction were intense to moderate, the epithelial lining of the alveoli showed mild to moderate alkaline phosphates activity in uncastrated cattle. However, the glycogen activity was mild to moderate, acid mucopolysaccharides showed moderate activity, the mild activity for amyloids was observed in castrated cattle. There was no reaction for alkaline phosphates activity in the castrated cattle.

A very meager information is available on histochemical aspects of male accessory sex glands in cattle particularly before and after castration. Such type of study may reveal histochemical changes produced under the adverse secretion of testosterone created by castration, confirming the importance and key role of testosterone in the structural and functional development of accessory sex glands in cattle. Hence the present study was undertaken to explore the histochemical studies of bulbourethral glands in uncastrated and castrated cattle.

For the present study bulbourethral glands were obtained from twenty-eight male adult bull of Deoni breed and other non-descript breeds. Out of twenty-eight animals fourteen were uncastrated and fourteen were castrated.

The tissue pieces of 5 mm thickness were collected from bulbourethral gland and fixed in 10% formalin. Routine paraffin embedding method was followed to process the tissue and sections were cut at 3 to 5 µ thickness and stained with following stains.

1. Demonstration of carbohydrate (Mucin)
   i. Hugesdon's Metachromatic method (Smith and Bruton, 1977).
   ii. Steedman's Alcian blue (Smith and Bruton, 1977).

2. Demonstration of carbohydrate (Glycogen)
   i. Best's carmine (Smith and Bruton, 1977)
   ii. McManus Periodic Acid Schiff's (PAS) reaction (Mukharjee, 1990)

3. Demonstration of Mucoprotein, Neutral and acid mucopolysaccharides.
   i. PAS Alcain blue method pH 2.5 (Singh and Sulochana, 1978)
   ii. Modification of Mowry's Colloidal iron (Singh and Sulochana, 1978)

4. Demonstration of Amyloids
   i. Benhold’s Congo Red (Mukharjee, 1990)
   ii. Toluidine blue (Mukharjee, 1990)

5. Demonstration of Calcium
   i. Von Kossa silver nitrate (Mukharjee, 1990)

6. Demonstration of lipids (Frozen sections)
   i. Suan black - B (Singh and Sulochana, 1978)
   ii. Oil Red 'O' in propylene glycol method (Singh and Sulochana, 1978)

7. Demonstration of nucleic acid (Frozen sections)
   i. Paulgen reaction of DNA (Singh and Sulochana, 1978)
   ii. Demonstration of alkaline phosphates cobalt method (Singh and Sulochana, 1978)

Histochemistry-Bulbourethral glands in uncastrated cattle: The present observations showed intense PAS positive reaction in the
basement membrane (Fig. 1) lining epithelium, secretory blebs, luminal secretions and secretory material in the lumen of the ducts which was in accordance with the similar findings of Stall Cup (1969) in bull, however, Kainer et al. (1969) and Sudhakar et al., (1981) confirmed PAS positive granules in the lining epithelium. The glycogen activity was intensely positive in (Fig. 2) the present study but Moussa et al. (1983) and Sudhakar et al. (1981) reported that the bulbourethral glands were devoid of any glycogen granules in buffalo bull. PAS alcian blue staining method revealed intense positive reaction for acid as well as neutral mucopolysaccharides which was also reported by Sudhakar et al. (1981) in buffalo bull. Large number of lipid granules were observed in the cell cytoplasm in the present study but Sudhakar et al. (1981) and Moussa et al. (1983) reported that the bulbourethral gland was devoid of lipid granules in a buffalo bull. In the present study acid mucopolysaccharides and amyloid reaction were intense to moderate. This could not be compared for non-availability of such records in the literature. The epithelial lining of the alveoli showed mild to moderate alkaline phosphates activity in the present investigation which was recorded by Moussa et al. (1983) in buffalo bull.

**Histochemistry of bulbourethral glands in castrated cattle:** In the present study PAS reaction revealed intense positive activity at the
luminal border of the epithelium (Fig. 3) which was in partial agreement with the findings of Sudhakar et al. (1981) in buffalo bull and Gupta and Singh (1982) in 10 and 30 days of post castrated goats. The glycogen activity was mild to moderate throughout the gland in the present study (Fig. 4) but Gupta and Singh (1982) reported no reaction for glycogen in castrated goats. The reaction for acid mucopolysaccharides in the present study revealed moderate activity; however, Sudhakar et al. (1981) reported positive reaction for acid mucopolysaccharides in buffalo bull. The fat granules were seen in the present study, but Sudhakar et al. (1981) reported acid fat deposition among the secretory tissue in castrated animals and Gupta and Singh (1982) recorded no reaction for lipids in 20 and 30 days post castrated goats. The mild activity for amyloids and moderate feulgen reaction in nuclei was also observed in the present study. There was no reaction for alkaline phosphate activity in the present study, however Gupta and Singh (1982) reported that the alkaline phosphate activity was reduced with the increase in the castration period in goats.

REFERENCES