Haryana Vet. **49** (December, 2010), pp 68-69

Research Article

HISTOMORPHOLOGY OF THE VOMERONASAL ORGAN OF EARLY GESTATIONAL NON-DESCRIPT GOAT FOETUS (CAPRA HIRCUS)

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ABSTRACT

The vomeronasal organ existed as an incomplete epithelio-cartilagenous tube in early goat foetuses. The internal epithelial duct was inverted comma shaped with ventral broader and upper narrower ends lined by two types of epithelial linings, i.e. medial olfactory and lateral respiratory epithelium. The propria-submucosa was loose, highly vascular and cellular and glands were not discernible. Propria-submucosa of lateral wall was more vascular than medial wall. The propria-submucosa was surrounded by a developing hyaline cartilage (C shaped) which did not encircle completely the propria-submucosa.

Key words: Goat foetus, morphohistology, vomeronasal organ

The vomeronsal organ (VNO; organ of Jacobson) is well developed in adult herbivores (Dellmann and Eurell, 1998). Its role in male reproduction, especially "flehman reflex" has been physiologically demonstrated in goats (Ladewig and Hart, 1980). But its histomorphology in early gestational goat foetus has not been reported, hence the present study was conducted.

MATERIALS AND METHODS

Six goat foetuses of less than 10 cm crown rump length were collected from Small Animal Slaughter House, Jabalpur. Coronal sections of head were obtained at the level between 5th and 6th palatine ruga. Tissue pieces including the organ were collected and fixed in 10% neutral buffered formalin. The paraffin blocks were prepared using standard histological technique for light microscopic studies. Sections of 5-6 µ thickness were stained with Harri's haematoxylin and eosin, Van-Geison's, Weigert's elastic, Gomori's silver impregnation and PAS stain (Drury and Wallington, 1980; Pearse, 1980).

RESULTS AND DISCUSSION

The VNO was a paired tubular structure located on either sides of ventral aspect of median nasal septum. The two VNOs were separated by a thick and dense layer of mesenchymal connective tissue which was not differentiated into cartilage (Fig. 1). The VNO was comprised of an internal epithelial duct, propria-submucosa and developing hyaline cartilage. The epithelial tube was inverted comma shaped with ventral broader and upper narrower ends (Fig. 1). In contrast, the crescent shaped epithelial tube has been reported in adult goat (Dellmann and Eurell, 1998). Its maximum inner transverse luminal diameter and the inner vertical diameter were 51.00±0.37µ and 119.17±0.31µ, respectively.

This tube was lined by two types of epithelial linings, i.e. olfactory and respiratory resting on the basement membrane. The olfactory epithelium present toward medial wall measured 16.85±0.09 µ, 16.88±0.10µ and 21.17±0.44 µ at dorsal, middle and ventral regions, respectively. This epithelium was comprised of basal, neurosensory and sustentacular cells. The luminal surface of the cells was covered with microvilli. The hairs of the olfactory cells were not so distinct. Occasionally large vesicular cells resembling goblet cells were also marked (Fig. 2).

The respiratory epithelium of lateral wall was lined with pseudostratified columnar epithelium having basal, ciliated, non-ciliated columnar and goblet cells. Epithelial heights at dorsal, middle and ventral regions were 12.47±0.26 µ, 12.47±0.24 µ and 20.50±0.67 µ, respectively. Lateral wall was not folded (Figs. 1 and 3) in this study which is in contrast to the observation of Ramkrishna and Tiwari (1988) who reported folds in midgestational goat foetus. The olfactory epithelium was of greater thickness in comparison to the respiratory epithelium.

The propria-submucosa was loose, highly vascular and cellular. The cells were widely separated by

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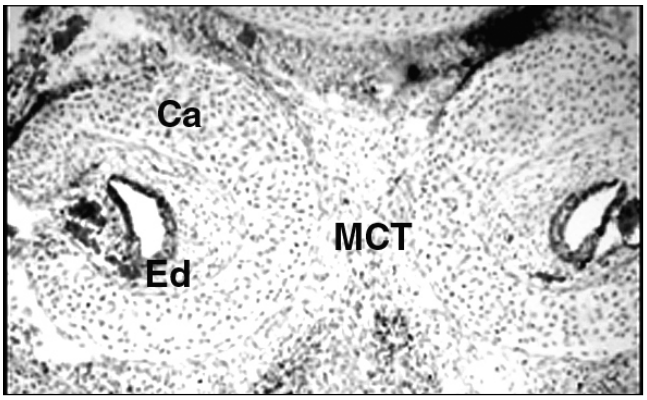

Fig 1. Photomicrograph of ventral aspect of median nasal septum showing bilateral vomeronasal organ separated by mesenchymal connective tissue (MCT), incomplete C shaped hyaline cartilage (Ca) and internal epithelial duct (Ed). (H. & E. x 40)

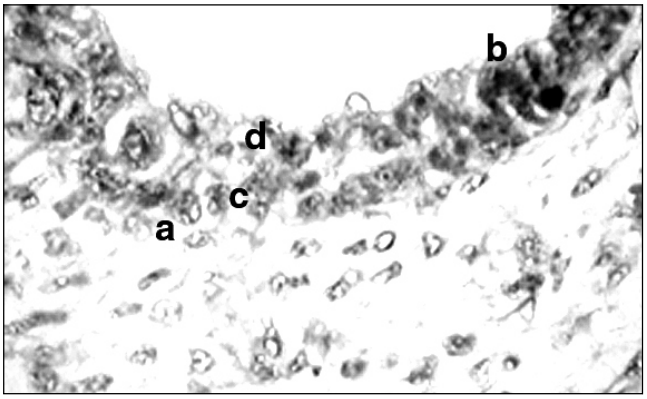

Fig 2. Photomicrograph of olfactory mucosa showing basal cells (a), sustentacular cells with microvilli (b), olfactory cells (c) and goblet- like cells (d). (H. & E. x 1000)

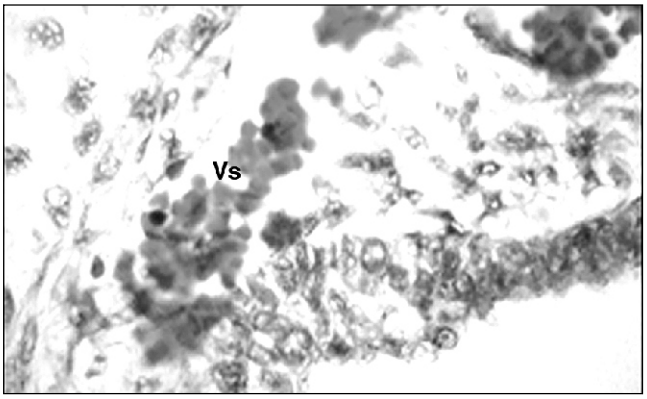

Fig 3. Propria submucosa of lateral wall showing numerous venous sinuses (Vs) as compared to medial wall. (H. & E. x 100)

abundant amorphous ground substance which was devoid of collagen fibres. The mesenchymal cells were irregular in shape and were having processes. The glands were not discernible. Thickness of lateral wall propria submucosa at dorsal, middle and ventral regions was 85.00±0.82 µ, 67.17±0.60 µ and 67.17±0.60 µ, respectively and of medial wall was 51.33±0.33 µ, 67.17±0.60 µ and 85.00±0.33 µ. Lateral wall propria-submucosa was more vascular having large sized venous sinuses (capillaries) as compared to medial wall propria-submucosa (Fig. 3).

The propria-submucosa was surrounded by a developing C shaped hyaline cartilage, which did not encircle completely the propria-submucosa. A well defined perichondrium separated the cartilage from the surrounding connective tissue. Total thickness of the wall including cartilage on medial wall at dorsal, middle and ventral regions was 204.17±0.31 µ, 204.17±0.31 µ and 195.50±3.34 µ, respectively and on lateral wall at dorsal, middle and ventral regions were 154.00±1.18 µ, 154.00±1.1 µ and 173.17±1.19 µ, respectively. Elastic fibres and reticular fibres were not discernible in propria-submucosa and perichondrium. Epithelium and propria submucosa showed mild PAS reaction and ground substance of cartilage exhibited moderate reaction for PAS positive substances.

Acknowledgements

We are thankful to the Dean, College of Veterinary Science and Animal Husbandry, M.P.P.C.V.V., Jabalpur for providing the facilities. We are also thankful to Dr. Pawan Kumar, Associate Professor, College of Veterinary Sciences, CCS HAU, Hisar for providing necessary guidance.

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