Histological studies on the tonsil of soft palate in goats

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ABSTRACT

Histological studies were conducted on the tonsil of soft palate in six month-old male crossbred goats. The tonsil was located on the nasopharyngeal side of the soft palate. The tonsillar surface epithelium presented small folds and was lined by pseudostratified ciliated columnar epithelium in the rostral half and stratified squamous epithelium in the caudal part. The epithelium mounting over the lymphoid accumulation or follicle associated epithelium was modified into a lympho-epithelium and was disrupted and heavily infiltrated by lymphocytes. Distinct crypts were not seen. In the lamina propria, lymphoid tissue constituted only a small portion of the tonsil and only two to three nodules were seen per low power microscopic field. Most of the lymphoid nodules had germinal centers. The average diameter of the nodules was 131.97±8.03 µm. Loose irregular connective tissue, lymphoid tissue and glands comprised the propria submucosa. The tonsil of soft palate was not encapsulated.

Key words: Goats, Histology, Tonsil of soft palate.

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The tonsils were located in the nasopharynx, oropharynx and laryngopharynx, in the digestive and respiratory tracts and played a key role in immunity since vast amount of foreign antigens entered the body at this site during feeding and breathing. The number and location of tonsils varies in different animals (Tenorio and Pabst, 2006). A perusal of literature revealed only few studies on the tonsil of soft palate in goats and hence the present work was undertaken.

The study was conducted on six crossbred male goats of six months of age, sold for slaughter from University Sheep and Goat Farm, Mannuthy. From median sections of head, tissue pieces from the nasopharynx and oropharynx of the soft palate were collected and fixed in 10 per cent neutral buffered formalin. The materials were processed routinely to obtain 5-6µm thick serial paraffin sections. The sections were stained by Haematoxylin and Eosin (Luna, 1968), Gomori’s rapid one step trichrome method for collagen fibres (Luna, 1968), Verhoeff’s method for elastic fibres (Singh and Sulochana, 1996), Gordon and Sweet’s method for reticular fibres (Bancroft and Gamble, 2003) and Unna’s method for mast cells (Luna, 1968).

In histological sections, tonsil of the soft palate in goats was located on the nasopharyngeal side of the soft palate which agreed with the reports of Cocquyt et al. (2005) in sheep. In contrast, according to Belz and Heath (1996) and Liu et al. (2012) in pigs and Kumar and Timoney (2006) in equines, the tonsil of soft palate was located rostrally on the oral surface of the soft palate.

The tonsillar surface epithelium presented small folds and was pseudostratified ciliated columnar in the rostral half and stratified squamous in the caudal part. These observations agreed with the reports of Casteleyn et al. (2010) in sheep. Contrary to this, in pigs (Anderson, 1974; Belz and Heath, 1996) and horse (Kumar and Timoney, 2006), the tonsil of soft palate was lined by non-keratinized stratified squamous epithelium as it was located in the oral cavity in these species. The cranial and caudal epithelium measured 75.40±4.28µm and 112.83±3.52µm respectively in its height. The follicle-associated epithelium was modified into a lympho-epithelium or reticular epithelium and was disrupted and heavily infiltrated by lymphocytes (Fig. 1). Distinct crypts were not seen in any of the animals under study. This is in accordance with the reports of Casteleyn et al. (2011) in sheep. Contrary to this, light microscopy of the tonsil of soft palate in pigs by Belz and Heath (1996) and Liu et al. (2012) revealed deep crypts with distinct neck and body. In both the pseudostratified ciliated columnar and stratified squamous epithelium lined regions, the height of the reticular epithelium measured 32.27±7.92µm and 51.37±2.08µm, respectively. Similar reports in other domestic animals are not available for comparison.

Loose irregular connective tissue, lymphoid tissue and glands comprised the propria submucosa. In the
subepithelial lamina propria, fine collagen fibres were seen. In the region of lymphocyte accumulation the reticular meshwork was also seen (Fig. 2). Mast cells were also seen in the propria-submucosa. In the deeper lamina propria, collagen and elastic fibers, a few reticular fibers and fine blood capillaries were seen in between the clusters of glandular acini. The tonsil of soft palate was not encapsulated as reported in sheep by Cocquyt et al. (2005). Contrarily, Belz and Heath (1996) and Kumar and Timoney (2006) reported that tonsil of the soft palate was capsulated in pigs and horse, respectively.

In the lamina propria, lymphoid tissue constituted only a small portion of the tonsil and there were two to three nodules seen as domes underneath the lining epithelium, per field of low power magnification of microscope. Most of the lymphoid nodules had germinal centers. The average diameter of the nodules was 131.97±8.03 µm. Belz and Heath (1996) and Liu et al. (2012) noticed dense aggregations of lymphoid cells and numerous lymphoid follicles in the tonsil of soft palate in pigs. It was concluded that the tonsil of soft palate in goats was non-follicular, non-encapsulated type of tonsil and was not well developed when compared to other domestic animals like pigs and horse.

REFERENCES