HISTOMORPHOLOGICAL STUDIES OF SEBACEOUS GLANDS IN RELATION TO AGE IN DIFFERENT REGIONS OF BAKERWALI GOATS

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Received: February 15, 2015; Accepted: March 7, 2015

Abstract: For the histomorphological studies, the skin samples from eighteen apparently healthy Bakerwali goats of three different age groups viz. below 1 year (neonatal), between 2-3 years (young) and above 3 years (adult) were collected. The sample collection was done irrespective of the sex of animal. The skin samples of 1mm x 1mm thickness were collected from eight different body regions viz. neck dorsal, neck lateral, neck ventral, thorax dorsal, thorax lateral, thorax ventral, loin dorsal and loin lateral. The samples were then processed as per standard histological procedures to study their histomorphology. The sebaceous glands observed were simple, branched and tubular and the periphery of the secretory unit contained a single layer of low cubiodal cells. The ducts of sebaceous glands were lined by stratified cuboidal epithelium, which emptied into associated hair follicle or into associated ducts. The number and depth of sebaceous glands increased from neonatal to adult age groups of Bakerwali goat. The density of sebaceous glands per field was maximum in thorax dorsal regions and minimum in loin lateral region while the depth of these glands were maximum in neck dorsal and minimum in thorax ventral in all age groups. The sebaceous glands showed intense PAS positive reaction and strong intensity for bound lipids.

Key words: Skin histomorphology, Sebaceous glands, Bakerwal goat.

INTRODUCTION

Bakerwali goat is one among the twenty well defined breeds of goat in India and it is the prominent goat breed of Jammu and Kashmir. This breed of goat is hardy, with heavy frame, have potential to resist diseases and migrate over long distances. There are two views about their origin: either this goat type is developed from the old wild goats of the hilly regions of Jammu and Kashmir through rearing by Bakerwals the pastural tribal community or Bakerwali goats have been migrated from central Asia along with nomads and subsequently established in Kaghan Valley of Pakistan and sometimes called as Kaghani goats.

The adaptability of the animal depends upon the skin, which acts as an effective barrier between external and internal environment of the body. The skin acts as a bad conductor between body and atmosphere [1,2]. The skin is the largest organ in the mammalian body. It is the versatile organ which is extremely important for protection, perception, external sensory awareness, wound healing and water balance. Skin acts as a first line of defense system of body. Skin primarily comprises of epithelial and connective tissues, hair follicles, sweat and sebaceous glands.
The sebaceous glands are microscopic glands in the skin that secrete an oily/waxy matter, called sebum, to lubricate and water proof the skin and hair of mammals. Cutaneous sebum is formed from the remains of destroyed cells and fat. It serves as a fatty lubricant for the hair and skin surface and makes the skin elastic and impermeable to water, chemical substances, and certain microorganisms. The secretion of cutaneous sebum is promoted by the contraction of the skin musculature. Information on the Sebaceous glands of northern Indian goats is scanty, so this study was conducted to collect the preliminary information about the Sebaceous in Bakerwali goats.

MATERIAL AND METHODS

Sample collection: The research study was approved by Faculty of veterinary Science and Animal Husbandry, SKUAST-J, R.S. Pura, Jammu. The study was conducted on eighteen apparently healthy Bakerwali goats. Skin samples were collected from the different slaughter houses of Jammu and Kashmir. The skin samples were collected from three different age groups which include goats below 1 year age (neonatal), 2-3 years (young) and above 3 years (adult). Samples of skin were collected from eight different regions of body (neck dorsal, neck lateral, neck ventral, thorax dorsal, thorax lateral, thorax ventral, loin dorsal and loin lateral regions).

Preparation of sample: The skin samples so collected were fixed in 10% Neutral buffered formalin [3], treated with alcohol-benzene series and paraffin embedding was done. The sections of 5-6µm were cut and utilized for routine and special histological staining techniques [4] to study the histomorphology and histochemistry. The histological stains so done were Haematoxylin and Eosin (H&E) stain [4], Von Gieson and Verhoeff’s [5], Gomori’s method [4], Periodic acid-schiff’s reaction [6], Sudan black B [4] and Masson’s trichrome [5].

Micrometry and statistical analysis: The detailed micrometric data of sebaceous glands was collected on different regions in different age groups of Bakerwali goat with the help of calibrated ocular micrometer. The depth of sebaceous glands was taken at 100 X magnification. The micrometric data analyzed by using Univariate ANOVA at 5% level. Multiple comparison tests were used to compare the difference between the groups and within the groups.

Independent sample T-test was used to compare the difference between the two regions (neck ventral and thorax ventral). For analysis, values of (P<0.05) were considered significant. All analysis was done by using SPSS-17. Statistical calculations (mean ± standard error) were recorded according to the standard statistical procedures recommended by [7].

RESULTS

In the present study the sebaceous glands observed were simple, branched, tubular, bilobed (Figs. 2, 3). They were found to be of variable shapes and sizes in cross sections i.e., round, oval or bean shape (Fig. 4). The bilobed sebaceous glands were found usually in close association with hair follicle. The periphery of the secretary unit contained a single layer of low cuboidal cells resting on the basement membrane surrounded by connective tissue. The ducts of these glands were lined by stratified cuboidal epithelium, which emptied into associated ducts or associated hair follicle (Figs.1, 5). The glandular ducts were seen with full of secretions (Fig.6) and in some areas the glandular ducts were filled with new and old secretions (Fig.7). The secretary end pieces of sebaceous glands were seen to be emptied into one or two ducts and finally into a one large excretory duct. Some end pieces directly open into surface via a single excretory duct. Large size sebaceous glands were seen in thorax ventral region of adult goat (Fig.8). The number of sebaceous glands per field increased from neonatal to adult age groups of goat. The density of sebaceous glands per field was maximum in thorax dorsal regions in neonatal (2.90±0.27), young (3.30±0.21) and adult (4.80±0.15) age groups. The minimum numbers of sebaceous glands were found in loin lateral regions in neonatal (1.10±0.16), young (1.20±0.13) and adult (1.40±0.16) age groups. The depths of sebaceous glands were less in neonatal goats and increased with advancement of age (Table 1). The neck ventral region showed a significant increase in depth from neonatal to young age groups (Table 1). The depth of these glands was maximum in neck dorsal and minimum in thorax ventral region in all age groups (Tables 1, 2, 3). The glands showed intense PAS positive reaction. The capsules of sebaceous glands were slightly PAS positive in all regions of all three age groups of goat. The glandular secretions of sebaceous glands showed mild PAS reaction. Strong intensity of sebaceous glands for bound lipids was observed in all regions of all age groups.
Fig. 1: Skin of Bakerwali goat showing sebaceous glands (SB) and their openings into ducts (D) in thorax ventral region PAS X 100. Fig. 2: Sweat and coiled-tubular sebaceous glands (Ct-SB) in thorax lateral region H&E X 200. Fig. 3: Bilobed sebaceous glands (BSB) with its duct’s H&E X 200. Fig. 4: Different types of sebaceous glands (SB) H&E X 200. Fig. 5: Opening of sebaceous gland (SB) in hair follicle (HF) Masson’s Trichrome X 100. Fig. 6: Presence of glandular secretions in duct (SD) and sebaceous glands (SB) H&E X 200. Fig. 7: Glandular ducts (D) with old (OS) & new secretions (NS) H & E X 100. Fig. 8: Large size of sebaceous glands in thorax ventral region. H & E X 400.
sebaceous glands were found usually in close association with hair follicle. These findings coincided with our study. Martin [13] observed the multilobular sebaceous glands in ferret skin.

The nature of sebaceous glands toward PAS in this study coincided as observed by Bhayani [14] in sheep. The glandular secretions of sebaceous glands showed mild PAS reaction. Strong intensity of sebaceous glands for bound lipids was observed in all regions of all age groups, same is reported by Bhayani [15] in sheep.

REFERENCES