HISTOLOGICAL STUDY OF SKIN EPIDERMIS IN RED KANDHARI COWS

M.B. Hole, N.S. Bhosle and P.J. Kapadnis
Colleg of veterinary and animal sciences
MAFSU, Parbhani – 431 402 India

ABSTRACT

The present study was conducted on 15 (fifteen) female red kandhari breed of cattle. Epidermis was the outermost layer of the skin and composed of four layers viz. stratum corneum, stratum granulosum, stratum spinosum and stratum basale. The melanocytes were more in number in lactating cow as compared with a non lactating and pregnant cow.

Majority of the mammals are covered with hair coat, which forms the first line of defense against the invading pathogenic macro and microorganism as well as physical environment (Govindaiah and Nagaranekar, 1983). Meagre information is available in literature related to histology of skin, initiated the present investigation.

The present study was conducted on 15 (fifteen) female red kandhari breed of cattle. The animals were grouped as lactating cows, non-lactating cows and pregnant cows. The skin biopsy samples were collected at the site of dorsal, lateral and ventral aspects at level of 7th rib and fixed in 10% formalin. The tissue were processed in laboratory by adopting standard method of dehydration, cleaning and embedding. The longitudinal and transverse sections of 5 to 6 micron thickness were obtained by rotary microtome (Singh and Sulochana, 1997). The tissues were then stained by using a Harries Haematoxyline and eosin stain for general histology (Mukherjee, 1992), Van-Gieson’s Stain, Silver impregnation stain, Verhoeff’s stain, Crossman’s modification of Mallory’s triple stain and Periodic Acid Schif stain.

The micrometry of stained histological sections was subjected to statistical analysis as per the standard procedures of Panse and Sukhatme (1967).

The epidermis was the outermost layer of the skin and composed of keratinised stratified squamous epithelium (Fig 1 and 2). It was composed of four layers viz. stratum corneum, stratum granulosum, stratum spinosum and stratum basale. The stratum lucidum was absent. The stratum corneum consisted of three to four layers of soft keratin. The stratum granulosum consisted of single cell layer. The stratum spinosum consisted four to five layers of polyhedral cells with rounded nuclei. Two types of cells viz. melanocytes and ‘clear’ or Langerhan’s cells were observed in all the body regions in red kandhari cow. The cytoplasm of the melanocytes presented melanin granules which appeared as aggregation over the nuclei.

The stratum basale was the basal layer of epidermis and presented a single layer of low columnar to cuboidal cells with a dark stained nuclei. The basal border of these cells showed interdigitations. The melanocytes were more in number in lactating cow as compared with a non-lactating and pregnant cow. The total skin thickness of epidermis in lactating cow in dorsal, lateral and ventral aspect of body region ranged from 34.86 to 46.48 μm, 39.84 to 49.80 μm and 41.50 to 58.10 μm with a mean of 41.6 ± 1.02, 43.36 ± 1.29 and 49.46 ± 1.90 μm respectively (Table 1).

The total skin thickness of epidermis in non-lactating cow in dorsal, lateral and ventral aspect of body region ranged from 36.52 to 44.82, 41.50 to 59.76 and 49.80 to 71.38 μm with a mean of 42.25 ± 1.03, 46.11 ± 1.30 and 55.61 ± 1.89 μm respectively. (Table 1.).

The total skin thickness of epidermis in pregnant cow at dorsal, lateral and ventral body region ranged from 36.52 to 48.12, 41.50 to 51.46

TABLE 1: Showing the thickness of epidermis

<table>
<thead>
<tr>
<th>Region / group</th>
<th>Dorsal</th>
<th>Lateral</th>
<th>Ventral</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>Mean ± SE</td>
<td>Range</td>
</tr>
<tr>
<td>Lactating (im)</td>
<td>34.86 – 46.48</td>
<td>41.65 ± 1.02</td>
<td>39.84 – 49.80</td>
</tr>
<tr>
<td>Non-Lactating (im)</td>
<td>36.52 – 44.82</td>
<td>42.25 ± 1.03</td>
<td>41.50 – 59.76</td>
</tr>
<tr>
<td>Pregnant (im)</td>
<td>36.52 – 48.12</td>
<td>41.99 ± 1.05</td>
<td>41.50 – 51.46</td>
</tr>
</tbody>
</table>

NS - Non significant
Sig - Significant 1% level

Fig- 1 Microphotograph of transverse section of skin from lactation cow showing:

K - Keratinocyte
EP - Epidermis
Sqe - Stratified Sq. epithelium.
Sg - Stratum granulosum.
Sp - Stratum Spinosum
Sb - Stratum basale.
H & E Stain, 400X

and 43.16 to 58.10 with a mean of 41.99 ± 1.05, 45.49 ± 1.29 and 48.57 ± 1.90 in respectively. The melanocytes was not prominent and less in number as compared to lactating and non-lactating cows.

The thickness of epidermis recorded in the present study was slight higher in the non-
lactating groups but values are less than in lactating and pregnant group as the values reported by Hafez et.al. (1955) in cattle. But the epidermal thickness was observed higher in Red Kandhari cow as compared to the values of the Calhoun and Stinson (1981).

REFERENCES