AGE RELATED CHANGES IN ELASTIC FIBER CONFIGURATION IN SKIN OF FETAL, NEONATAL & ADULT GOAT *(CAPRA HIRCUS)*

TRIPATHI M.*

ZAIDI B.*

SARKHEL S.*

Dr. Mahima Tripathi.*

ABSTRACT

Study was conducted on 10 goat fetuses (05 - group I CR 25 cm and 05 - group II CR 25 cm & above), 05 neonatal goats and 05 adult goats (*Capra hircus)* assembled in different groups to study the configuration of elastic fibers in the skin of *Capra hircus*. Dermis composed of upper papillary and deeper reticular layer. The elastic fibers appear originating in group II fetuses (not found in group I up to CR length 25 cm). These fibres were thin running parallel to the epidermis in papillary layer, but running horizontal, vertical and oblique direction to epidermis in reticular layer in other groups. In group II and neonate group the fibres were firmly arranged supporting the dermis in a compact clutch. Adult group shows an unfastened association with remaining dermal components.

Key words: Fetus, Neonate**,** Dermis, Elastic, Papillary & Reticular layer.

* Mata Gujri Women's College, Jabalpur, (M.P.) India

INTRODUCTION

Goats are one of the earliest domesticated animals, providing humankind with milk, meat, leather and fibres. They include several species of small, cloven-hoofed ruminants constituting the genus *Capra*.

The dermis constitutes papillary & reticular layer. Very meager information is available on the fibre pattern in dermal layer of goat (*Capra hircus)* skin in different age groups, hence the present investigation was undertaken to see the elastic fiber configuration in three different age groups. The study was conducted on twenty goats (*Capra hircus).* Goat skins contain less hair than the skin of cattle and sheep and the network of collagen fibres is compact and very strong in goat skin.

Elastic fiber makes tissues elastic, so that the tissue will recoil after stretch. Elastic fibres are 5 times more extensible than an elastic band. Mixing up collagen (less extensible) and elastic, prevents overstretch. Elastic fibres appear in dermis much later than the collagen fibres. The collagen reacts with tanning agents to form the leather substances. The number of elastic fibers present in papillary layer is also important for leather production. (Mir Shabir Ahmad et.al *2011*). The arrangement of elastic fibres is complex because of their multiple interactions with various other dermal components, tightly regulated developmental pattern of deposition, multi-step hierarchical assembly, unique properties and influence on cell phenotype. Here we reported the complexity of the elastic fibre system and its detailed structural analyses in various age groups of goat skin type.

MATERIALS AND METHODS

The present study was conducted in four groups as Group I - 5 fetuses (up to CR length 25 cm), Group II - 5 fetuses (CR length 25 cm and above), 5 neonates (birth to 3 months of age) & 5 adult indigenous goat. The skin samples from different regions of the body - dorsal, ventral, thigh, flank and neck regions were taken with the help of razor blade, scissors and forceps. The tissues were fixed in 10% neutral buffered formalin solution for 36 to 48 hours. (Lillie and Fullmer, 1976; and Drury and Wallington, 1980). The tissues were then processed in laboratory by adopting standard methods (Drury and Wallington, 1980) of dehydration, clearing and embedding. They were processed and sectioned using routine histological procedures. The

paraffin tissue sections of 3-5 um thickness were stained with orcein stain to study elastic fibers configuration.

RESULTS AND DISCUSSION

Group I fetus (up to CR length 25 cm)

In our observations the elastic fiber formation in the sections of group I fetus was not evident.

Group II fetus (CR length 25 cm & above)

In group II fetuses the elastic fibres appeared to arise at the angles of the fibroblast cell mainly in middle zone of matrix.

The fibres in subepithelial matrix/dermis confirmed general pattern in all the regions of the body. The matrix here mainly consisted of connective tissue cell and newly formed delicate elastic fibres which were less prominent in deep part of the dermis particularly in initial stages. The intensity of fibers as reported were general in all samples that elastic assimilation was intense found in neck & dorsal region of the skin. The fibers were found moderate to weak in flank region & weak in ventral region.

Group III (Neonate)

In group III noticed that arrangement was specific in all samples as the elastic assimilation was highest (intense) found in neck and dorsal region of the skin. However in dorsal region the fibres appeared to be more consistent. In neck region they were more irregularly oriented. The fibers were found moderate in other body regions such as ventral, thigh and flank.

The fibers found in abundance between and around hair follicles. The sweat glands as reported were clearly seen sparsely layered with elastic fibers, tubular, deeply located in the dermis below the sebaceous gland.

Similar observations were also reported by S.T. Mandage et.al. (2006) in Group 0-3 months of age in sheep where the Elastic fibres were abundant in reticular layer and arranged around the sweat glands and wool follicles.

Group IV (Adult)

These fibres were abundant in reticular layer. In this group revealed regular pattern in all samples that elastic assimilation was highest (intense) found is dorsal. The fibres were found intense to moderate in other body regions such as neck, flank & thigh. The fibers were found moderate in ventral.

The fibres in the papillary layer were thin, sparse, lightly stained and showed parallel arrangement (mainly in the superficial dermis). Reticular layer of dermis showed thick, loosely arranged fibres in the form fascicles. The fibres condensed in bands around the hair follicles, sebaceous glands and blood vessels but sparse around sweat glands .They intermingled in the arrector pili muscles. P.J. Kapadnis et.al. (2005) noticed the elastic fibers in neck region of goat were thick and located at both ends of arrector pill muscles attaching to hair follicles in reticular layer.

The elastic fibres were mostly presented superficial to the level of the sweat gland.

Table 1. Analysis of cutaneous elastic

	Neck	Dorsal	Thigh	Ventral	Flank
Group I	-	-	-	-	-
Group II	+++	+++	++	+	++ to +
Group III (Neonate)	+++	+++	++	++ to +	++
Group IV (Adult)	+++	++++	+++	++	+++ to ++

- **Inconspicuous, + Weak, ++ Moderate, +++ Intense,**

PHOTOGRAPHS

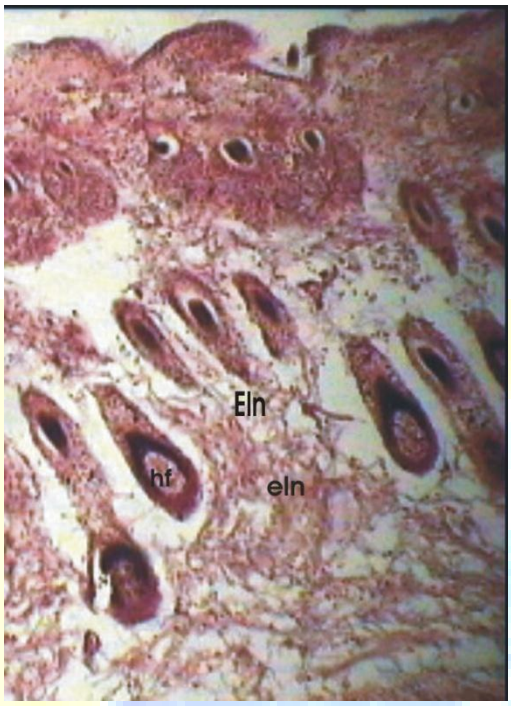

Fig 1. Photomicrograph – cross section of skin of Foetal goat (Group II), Flank, orcein stain Showing hr-hair, eln-elastic fibres.

Fig 2. Photomicrograph – cross section of skin of Foetal goat (Group II) neck, orcein stain Showing hr-hair, eln-elastic fibres.

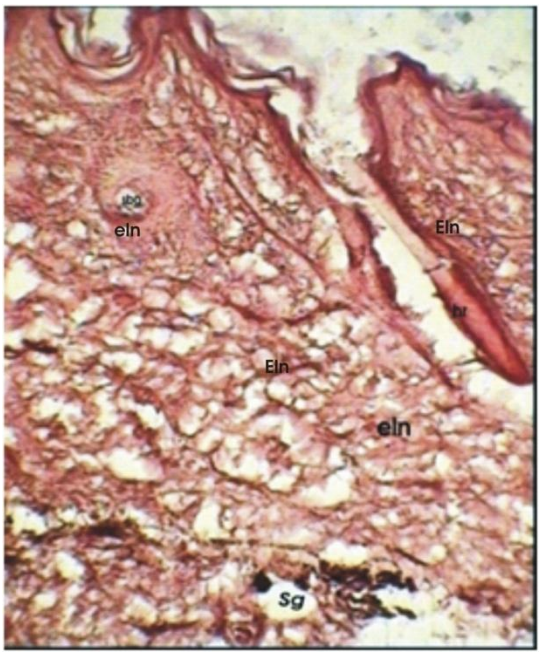

Fig 3. Photomicrograph – cross section of skin of Neonatal goat, ventral, orcein stain Showing hr-hair, sg-sweat gland, eln-elastic fibres & sbg-sebaceous gland.

Fig 4. Photomicrograph – cross section of skin of adult goat, dorsal, orcein, x 400 showing moderate to intense elastin

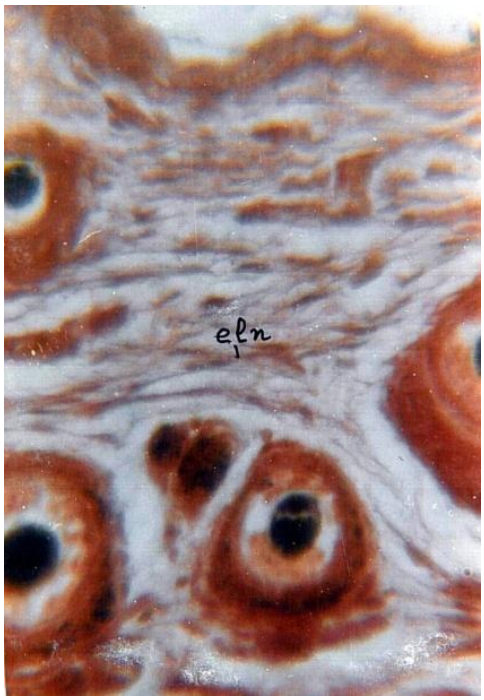

Fig 5. Photomicrograph – cross section of skin of adult goat, dorsal, orcein stain Showing hr-hair, eln-elastic fibres.

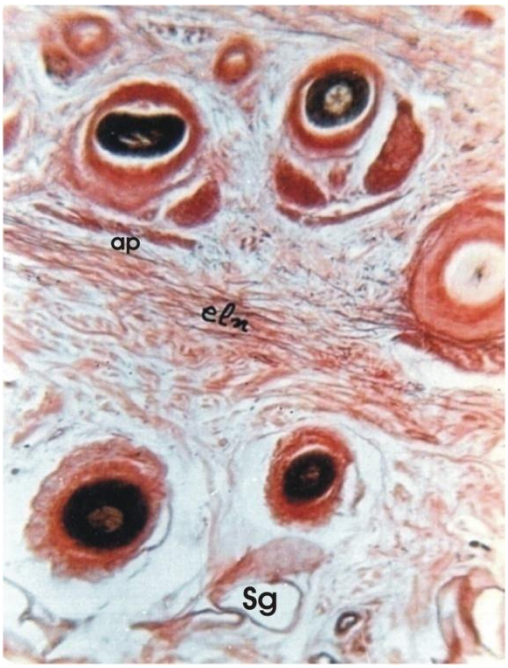

Fig 6. Photomicrograph – cross section of skin of adult goat, ventral, orcein stain Showing hr-hair, eln-elastic fibres.

REFRENCES

1. Drum, J.E. and O'rahilly, R. (1977) The assessment of prenatal age from the crown –rump length determined ultrasonically. Am j Anat, 148: 555-560.
2. Lillie, R.D. and Fullmer, H.M. (1976) Histopathologic technique and Practical Histochemistry. 4th ed. MnGraw-Hill Book Company, A Blakiston Publication, p. 942.
3. Mir Shabir Ahmad1, O.R. Sathyamoorthy2, Geetha Ramesh3 and C. Balachandran4, Micrometrical Studies on The Skin of Madras Red Sheep *(Ovis Aries)* In Different Age Groups**,** *Tamilnadu J. Veterinary & Animal Sciences 7 (1) 23-28, January - February 2011.*
4. P.J. Kapadnis, N.S. Bhosle and C.S. Mamade, Study on Connective Tissue Fibre in Neck Skin of Goat, *Indian J* Anim. *Res*, 39 (1) 60·62,2005.
5. S.T. Mandage, N.S. Bhosle and P.J. Kapadnis, Histomorphologic Study on Sweat Glands of Skin in Deccani Sheep, *Indian J. Anim. Res.*, 43 (2) : 133-135,2009.
6. S.T. Mandage, P.J. Kapadnis, N.S. Bhosle and C.S. Mamde, Age Related Changes In Connective Tissue Fibres in Skin of Deccani Sheep**,** Indian J. Anim. Res., 40 (1): 87 - 88, 2006.