

HISTOARCHITECTURE OF SENSORY STRUCTURE IN SKIN OF RABBIT

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ABSTRACT

The skin of rabbit consisted highly specialized sensory structure i.e. Tylotrich follicles were present throughout the skin. These follicles were larger than the normal hair follicles. The most prominent sensory structure of Tylotrich follicle were annular complex which consisted of annulus around the capillaries externally, thin band of smooth muscle centrally and nerve fibres internally. The Haarscheibe surrounds the orifice of tylotrich follicle.

KEY WORDS : Histoarchitecture , Sensory Structure , rabbit, Skin

INTRODUCTION

The mammalian hair follicle is a complex mini sensory organ formed during development (Mayami *et al.*, 2007). The newly formed hair follicles proliferated normally and generated hairs as well as sebaceous glands. Some of the hair follicles show high degree of adaptation for sensory function in rabbit, mouse, rat, guinea pig. These highly specialized sensory hair follicles are scattered throughout the skin of rabbit. The present study was undertaken to see the histoarchitecture of specialized sensory hair structure of skin of rabbit.

MATERIALS AND METHODS

Skin samples from 6 rabbits were collected. The tissue pieces were fixed in 10% neutral buffered formalin. After fixation paraffin blocks were prepared and sections of 5-6 microns were cut and stained by Haematoxyline and Eosin method for normal microscopic structure, Verhof stain for collagen fibres and Bielschowsky's silver impregnation method used for demonstration of nerve ending as per Singh and Sulochana (1998)

RESULTS AND DISCUSSION

Epidermis of rabbit consisted typical basal, spinous, granular and cornified layers. These findings are similar to observations recorded by Scheffer *et al.*(1984). The cornified cells were characterized by scanty cytoplasm and keratin granules (Fig.1). These cornified cells provides the physical protection to underlying layers and contribute to the permeability barrier as suggested by Odland (1983).

The sebaceous glands consisted of clusters of about ten cells embedded in the wall of the hair follicles of rabbit (Fig.2). These observations are in collaboration with finding recorded by Carlisle (1954). The cells were large with acidophilic cytoplasm and round nuclei. All hair follicles showed high degree of adaptation for sensory function. Some of the large follicle scattered throughout the skin were tylotrich follicle as reported by Straile (1960). These follicles mainly consisted of two important structures namely Annular complex and Haarscheibe (Fig.3).

Annular complex

The annular complex composed of three concentric structures that surrounds the external root sheath of tylotrich follicle just above the hair bulb. The large outer prominent component was annulus consisted of coarse connective tissue fibres with numerous capillaries. The large connective tissue fibres of annulus were easily recognized. They wrap around the capillaries in circular manner due to erection of annulus which controls the sensitivity of tylotrich follicles associated with other follicle. The arrector pilli muscle associated with other follicles (Fig.4) was missing in these follicles. These observations are in collaboration with the reports of Straile (1960). The central component of annular complex composed of thick band of elongated smooth muscle like cell which surrounds the follicle along the inner border of annulus. The cross section of tylotrich follicle showed regular alignment of nuclei along the side of follicle. The inner component of annular

complex consisted of bilaminar arrangement of nerve fibres associated with smooth muscle like cells.

Haarscheibe

This structure composed of thick layer of cells in the epidermis which surrounds the orifice of tylotrich follicle. These were located on caudal side of hair follicles near to the surface skin. This specialized area consisted more layer of cells than the adjacent layer of epithelium. This might be due to high proliferative rate of cells within specialized region. It composed of two columnar cells, one cell containing nuclei at upper part of cells while the nuclei of other cell type lie near the basement membrane. Third type of elongated cells are also seen at the basal layer of Haarscheibe perpendicular to the surface of skin.

There was specialized region of connective tissue located between Haarscheibe and Annular complex in dermis consisting numerous fine nerve endings and capillaries. The large nerve divided within connective tissue capsule of tylotrich follicle. Branches of this nerve innervates the Annular complex, Haarscheibe and its associated structure. The specialized part of tylotrich follicle was separately innervated and vascularised. Nerve, arteriole and venule were found deep within the dermis near each tylotrich follicle. The dilation of these capillary network was controlled by contraction of smooth muscle within the wall of arteriole and venule.

Presence of highly specialized structure in tylotrich follicle possibly controlled the sensitivity of the associated structure. It can be speculated that the annulus of tylotrich follicle controls the sensory threshold of the associated nerve endings. In the skin containing quiescent hair follicle, only gentle rubbing is needed to evoke visible dilation of capillaries within annulus. The tylotrich follicle alone fails to produce dilation by similar stimuli. This change occurs may be due to increase in the size of follicle and hair. During the growth phase the sensory and erectile part of tylotrich follicle make considerable structural and morphological adjustment of Annulus and Haarscheibe.

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