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Research Paper

MICROANATOMICAL STUDIES ON THE PINEAL GLAND OF PIG

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The pineal gland of pig was surrounded by a thin layer of capsule, which was made up of collagen and reticular fibers. The connective tissue capsule extended into the parenchyma and divided the gland into lobes but lobules were not distinct. The pineal gland of pig showed outer denser portion similar to the cortex and a central small portion called medulla. The parenchyma of the gland consisted of pinealocytes, glial cells and blood capillaries. The pinealocytes are the chief cells and distributed throughout the gland and arranged as clusters. The pinealocytes were round to oval shaped with dark cytoplasm and euchromatic nuclei. The glial cells were larger than the pinealocytes and based on their nuclear morphology the glial cells were categorized into three types, viz., the type-I cells were large round type with and basophilic nucleus, the type-II cells were smaller and without process, the type-III cells were elongated and appeared like smooth muscle cells and showed two distinct cytoplasmic processes. The *corpora arenacea* was not reported in the pineal gland of pig.

Keywords: Pineal gland of pig-microanatomy

INTRODUCTION

Pineal gland is the evagination of the dorso-caudal aspect of the diencephalon of brain. It is attached to the 3rd ventricle by a stalk. The pineal gland secretes 'melatonin' hormone and several other similar substances, these substances play an important role in reproductive and physiological activities of the individual (Guyton and Hall, 2006). Due to its anatomical and physiological significance several reports have been made on pineal glands of domestic animals. But little information is available on the histology of pineal gland of pigs, hence the

present study was under taken to elucidate histology and architecture of pineal gland of pigs.

MATERIALS AND METHODS

The study was conducted on 6 adult large white York shire pigs. The tissue samples were collected from pigs which were slaughtered at All India Coordinated Research Project on pigs (AICRP on pigs), CVSc, Tirupati. The pineal glands were collected and preserved in 10% neutral buffered formalin (10% NBF) immediately after the slaughter. The tissue pieces were processed for paraffin sections of 5

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to 6 micron thickness for histomorphology. The paraffin section sections were subjected to Haematoxylin and Eosin method for general histomorphology (Singh and Sulochana, 1997).

RESULTS AND DISCUSSION

The pineal gland of pig was surrounded by a thin layer of capsule, which was made up of predominantly collagen and few reticular fibers as observed in goat (Sharma *et al.*, 1980 and Kumar *et al.*, 1995) and horse (Kumar *et al.*, 2007). The external surface of the capsule had contact with the telachoroidea of 3rd ventricle of brain. However, Kumar and Kumar (2011) have noted epithelial lining on its outer surface of pineal gland of pig contrary to the present finding. In the present study epithelium on its outer surface was not recorded.

The connective tissue septa from capsule extended into the parenchyma and divided the gland in to lobes but lobules were not distinct. But Kumar and Kumar (2011) have noted distinct

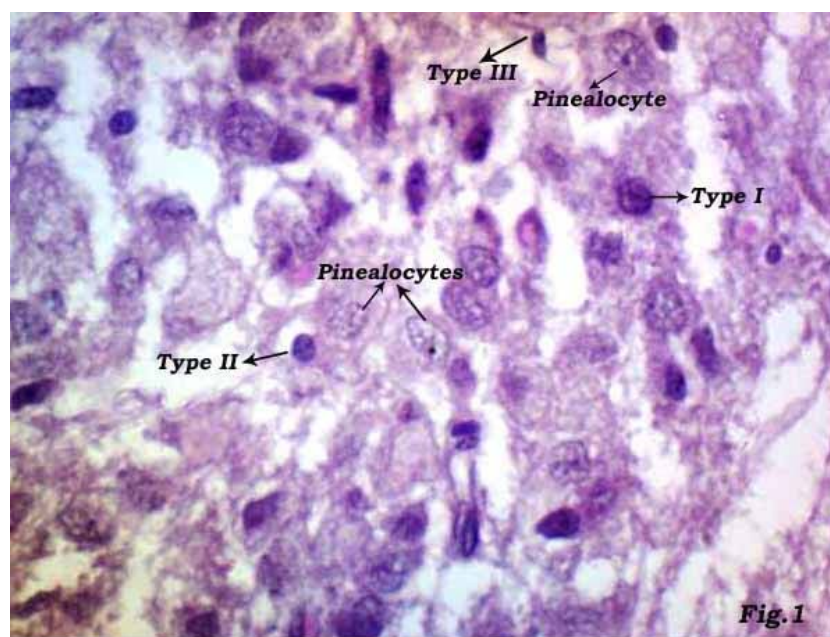
lobules in pineal gland of pig and in goat (Sharma *et al.*, 1980 and Kumar *et al.*, 1995).

The pineal gland of pig showed outer denser portion with many pinealocytes and neuroglial cells similar to the cortex and a central small portion medulla with many interlocking fibers and this consisted few pinealocytes. Similarly, Kumar and Kumar (2011) in pig, Sharma *et al.* (1980) in goat also reported outer denser cortex and medulla like structures in pineal gland.

The parenchyma of the gland consisted of pinealocytes and glial cells and blood vessels of different sizes. The pinealocytes are the chief cells and distributed throughout the gland. They were arranged in the form of irregular clusters. Similar observations were also made in pigs (Kumar and Kumar, 2011), goat (Kumar *et al.*, 1995). The pinealocytes were round to oval shaped with dark cytoplasm and showed euchromatic nuclei (Figure 1). Similar observations were also reported by Sharma *et al.* (1980), Pathak *et al.* (2009) in goats, whereas

Figure 1: Photomicrograph of Pineal Gland of Pig is Showing Pinealocytes and Different Types Neuroglial Cells

Haematoxylin & Eosin X 1000



Kumar and Kumar (2011) in pigs recorded two types of pinealocytes, i.e., light and dark type. But in the present study such demarcation was not observed in pigs.

The glial cells were larger than the pinealocytes, the shape of the nuclei varied from oval to elongated, the cytoplasm was pale in color and nuclei showed euchromatin. Based on their nuclear morphology the glial cells were categorized into three types as reported by Kumar and Kumar (2011) in pigs, Kumar *et.al.* (1995) in goats. The type I cells were large and showed large basophilic nucleus (Figure 1). The type- II cells were smaller and sparse in number and without process. The type-III cells were elongated and appeared like smooth muscle cells and showed two distinct cytoplasmic processes (Figure 1). Similar observations were also noted in pig by Kumar and Kumar (2011), and in sheep (Saggar *et al.*, 2001 and Prbhavathi *et al*, 2010).

The corpora arenacea was not reported in the pineal gland of pig. It in accordance with the Sharma *et al.* (1980) and Kumar *et al.* (1995) in goats and Saggar *et al.* (2001) in sheep. Contrary to this Kumar and Kumar (2011) noted *copora arenacea* at some places in pineal gland of pig.

CONCLUSION

The pineal gland of pig was surrounded by a thin layer of capsule, which extended into the parenchyma and divided the gland in to lobes, but lobules were not distinct. The pineal gland of pig showed outer cortex and a central medulla. The parenchyma of the gland consisted of pinealocytes, glial cells and blood capillaries. The pinealocytes are the chief cells and distributed throughout the gland and arranged as clusters and rosettes. The glial cells were larger than the pinealocytes and based on their nuclear morphology the glial cells were categorized into three types, viz., the type I, II and type III cells. The *corpora arenacea* was not reported in the pineal gland of pig.

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