Postnatal development of the pineal gland in the goat (*Capra hircus*) – light and electron microscopy studies

M. Nowicki¹,², B. Przybylska-Gornowicz¹

¹ Division of Histology, Department of Functional Morphology, Faculty of Veterinary Medicine, University of Warmia and Mazury in Olsztyn, Oczapowskiego 13, 10-719 Olsztyn, Poland
² Institute of Anatomy, University of Leipzig, Leipzig, Germany

Abstract

This study was conducted to investigate structural transformations of the goat pineal gland during postnatal development. The pineals of newborn, 4-week-, 4-month-, 1-year- and 3-year-old male goats were prepared for qualitative and quantitative investigations at both light and transmission electron microscopy levels. In the first 4 months after birth, the pinealocytes developed very intensively, which was connected with enlargement of their volume as well as distinct qualitative and quantitative transformations of their cytoplasmic organelles. Parallel to these changes, the pineal parenchyma underwent deep reorganization and the mosaic pattern, characteristic for newborns, disappeared. At the same time the meshwork of blood vessels supporting the goat pineal gland developed conspicuously. From fourth months to one year of postnatal life continuation of the growth of some pinealocyte organelles and very intensive development of all components of the pineal connective tissue were observed. In the three-year-old goats some decrease in the relative volume of most cytoplasmic structures of pinealocytes as well as increase in collagen fibers in stroma were noticed. The investigations established intensive growth of the goat pineal to the age of 4 months, which included mainly some increase in the pinealocyte and their structures. The pineal gland of 4-month- and 1-year-old goats showed morphological features which are considered as symptoms of high secretory activity. The structure of the pineal gland in 3-year-old animals and the changes observed both in their pinealocytes and connective tissue in comparison with 1-year-old individuals point to some decrease in the goat pineal activity in this age.

Key words: pineal gland, postnatal development, histology, ultrastructure, goat

Introduction

The pineal gland develops from the evagination of the diencephalon roof lying between the habenular and posterior commissures, which is known as the pineal recess. Neuroepithelium covering this recess is the source of pinealocytes and glial cells, whereas the mesenchyme surrounding the pineal recess forms the stroma of the gland (Pévet 1983).

During postnatal life the pineal gland undergoes deep transformation resulting from proliferation and growth of pinealocytes as well as qualitative and quantitative changes in the structure of the pineal stroma. There are several studies concerning various aspects