An Immunohistochemical Study of Retinal Collagen IV Expression during Pre- and Postnatal Periods in Balb/c Mice

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Abstract

Objective: Basement membranes are specialized extracellular matrices which play important roles such as cell regulation, proliferation and migration. Collagen fibers, especially type IV, are the most important basement membrane constituents. As retina is one of the target organs in diabetes mellitus, and nephropathy is a major cause of end stage renal and retinal diseases resulting in increased morbidity and mortality, early diagnosis leads to better treatment. Hence, in this investigation, the appearance and distribution of collagen IV during gestational days and early postnatal periods were observed. Materials and Methods: ٢٤ intact female Balb/c mice were kept under normal conditions. After mating, appearance of a vaginal plug was assumed as day zero of the pregnancy. From days ١٣-١٨ of gestation, the pregnant mice were euthanised and their embryos as well as pups from days ١ to ٥ were collected. For histochemichal studies, heads of the specimens were fixed, serially sectioned and immunohistochemicall studies were performed by using monoclonal antibodies for tracing of collagen type IV. Results: Our findings revealed that the amount of collagen IV in the internal limiting membrane (ILM) and extra cellular matrix (ECM) of the retina, as well as vessels of the vitreus body appear on embryonic day ١٦. Also, a patchy distribution was observed in the pigmented epithelium which continued to further develop until the end stage of embryonic life. Strong labeling was observed until postnatal day ٣ but did not increase significantly thereafter. Conclusion: These findings establish the importance of collagen IV during the critical period of retinal development. In addition, this study indicates that high levels of collagen IV are present in the basal membrane (BM) of the inner limiting membranes and pigmented epithelium (٣rd post natal on the ٣(rd) postnatal day.