Introduction

The separation of the posterior vitreous cortex and the inner limiting membrane (ILM) of the retina, called Posterior Vitreous Detachment (PVD), can be detected by Optical Coherence Tomography (OCT). To visualize the distributions of the inner limiting membrane components on eyes presenting enzymatically induced PVD, we performed and analyzed different histological stains. The impact of V20I on different ILM components were also studied in vitro.

Methods

Lysis profiles of fluorescently labeled substrates in presence of V20I (a microplasmin analogue able to induce PVD) were studied in vitro. The test was performed in a 96-well micro plate that was coated with the fluorescently labeled substrates. Various dilutions of V20I were tested after which the plate was covered and incubated at 37°C. Samples were analysed after different times (up to 3 hours).

Periodic acid shift (PAS) and immunohistochemical stains were performed to visualize the distribution of the ILM components on porcine and murine eyes presenting PVD (vs. control eyes). Various dilutions of V20I were tested after which the plate was covered and incubated at 37°C. Samples were analysed after different times (up to 3 hours).

Discussion

Different distribution patterns in the retina were observed for the selected markers. The inner retinal blood vessels were labelled by laminin alpha 1 and collagen IV. Fibronectin, collagen IV and laminin alpha 1 were detected in the ILM in normal control retina. The fibronectin staining in this retina seemed to be specific to the mouse after PVD induction by V20I. The human situation remains to be investigated.

Conclusions

Whilst collagen IV and fibronectin were substrates of V20I in vitro test, those proteins were still detectable by immunohistochemistry in the mouse and pig after induction of PVD by V20I. In contrast to Chen et al. finding, we do conclude to a partial digestion of those proteins in vivo situation. The distribution patterns observed for collagen IV and fibronectin are similar in mouse and pig in normal control retina. Different behaviors of the studied substrates were observed between the pig and mouse after induction of PVD by V20I. The complete fibronectin segregation with the PVD interface seems to be specific to the mouse after PVD induction by V20I. The human situation remains to be investigated.

Figure 1

Figure 2

Figure 3

Bibliography

1. Halfter et al., 2008. Origin and turnover of ECM proteins from the inner limiting membrane and vitreous body
3. Chen et al., 2009 : Microplasmin Degrades Fibronectin and Laminin at Vitreoretinal Interface and Outer Retina during Enzymatic Vitrectomy.