IMMUNOHISTOCHEMICAL STUDIES ON FIBRONECTIN AND VITRONECTIN IN PSEUDOXANTHOMA ELASTICUM

Toshitatsu Nogita, M.D., Mizue Maeguchi, M.D., Sayori Torikai, M.D., Makoto Kawashima, M.D. and Akira Hidano, M.D.
Department of Dermatology, Tokyo Women's Medical College
Correspondence to: Toshitatsu Nogita, M.D.
Department of Dermatology, Tokyo Women's Medical College, 8-1 Kawadacho Shinjuku-ku, Tokyo 162, Japan

INTRODUCTION

Pseudoxanthoma elasticum (PXE) is the only disease that singles out the elastic fiber as a specific target for calcification. The areas in which the etiologic mechanism has been proposed are as follows: the elastic fiber, mucopolysaccharides, calcium, phosphorus, and Vitamin D metabolism, protease, and the fibroblast.

The purpose of the present study was to determine the distribution of fibronectin and vitronectin immunoreactivity in PXE.

MATERIALS AND METHODS

A skin specimen was obtained from the lateral neck. The sample was immediately frozen at -180 °C in liquid nitrogen. Cryostat sections (4 μm) were placed on albumin coated slides, and endogenous peroxidase activity was blocked with hydrogen peroxidase.

Sections were incubated with anti-fibronectin polyclonal antibody diluted 1/100 in phosphate buffered saline (PBS) and anti-vitronectin monoclonal antibody diluted 1/50 in PBS overnight at 4 °C. After washing with PBS, sections were incubated with biotinylate anti-human rabbit antibodies for 30 min at 37 °C, and incubated with ABC reagent for 30 min at 37 °C. The substrate was developed with diaminobenzidine solution. Finally, sections were counterstained with hematoxylin.

RESULT

A skin specimen was obtained from the lateral neck, in which abnormal granular material, stainable with both Weigert's stain and Kossa's stain, was found in the upper and middle part of the dermis.
Granular material was also immunostained with polyclonal anti-fibronectin antibody and with anti-vitronectin antibody in the avidin-biotin peroxidase complex technique (Figs. 1 and 2).
Nogita T et al: FN and VN in PXE

DISCUSSION

Fibronectin (FN), a high molecular weight glycoprotein of 440,000 daltons, is synthesized and secreted by fibroblastic cells, endothelial cells, macrophages and other mesenchymal cells. It is well known that FN has a specific affinity for collagen, fibrin, heparin, hyaluronic acid, Clq and others. FN plays an important role in multibiological activities, including cell to cell adhesion, cell to substrate adhesion, migration and differentiation of cells, maintenance of cellular structure, wound healing, blood coagulation and opsonic function.

Vitronectin (VN), also known as serum-spreading factor and S-protein, is a multifunctional glycoprotein present in plasma and in the extracellular matrix. It is an alpha-globulin that has been isolated in the form of two noncovalently associated polypeptides with molecular weights of 65,000 and 75,000.

The pattern of vitronectin immunoreactivity in PXE corresponded to that of standard elastic staining, suggesting that vitronectin is associated not only with normal, but also with degenerated elastic tissue.

In the pattern of fibronectin immunoreactivity, it was noteworthy that fibronectin was positive in degenerated elastic tissues. Our immunohisto-chemical results suggest that a kind of tissue damage recovery mechanism causes fibronectin deposition in degenerated elastic tissue in PXE.

Fig.1 Fibronectin immunoreaction in granular materials and vessel walls in dermis.

Fig.2 Vitronectin immunoreaction in granular materials and elastic fibers in dermis.

REFERENCE