

NESTIN-POSITIVE CELLS WITHIN PATIENTS WITH CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION

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Objective

Chronic thromboembolic pulmonary hypertension (CTEPH) is caused by thromboembolisms in proximal and by arteriopathy in distal pulmonary arteries (PA). Both lead to PA obliteration resulting in the increased PA resistance. The pathophysiology is not yet clarified but altered regulation of vascular and circulating cells due to a disturbance of endothelial integrity and permeability play an important part. Therefore it is crucial for the understanding of pathophysiological mechanisms to investigate cell phenotypes and their characteristics included in PA of CTEPH. In the present study the expression of nestin, a marker for stem and precursor cells as well as for activated endothelial cells during neovascularization, was analysed in thrombotic tissue from pulmonary endarterectomy (PEA) samples from CTEPH patients.

Methods

PEA tissue samples from 20 CTEPH patients (10 women, 10 men) were processed according to standardized procedures for histological and immunohistological evaluation. The specimens were examined for nestin expression by the use of a monoclonal antibodies against nestin (1:200). Proximal and distal lesions were analysed regarding nestin expression.

Results

Histomorphologically the proximal samples were characterized by homogenous fibrous tissue with low amounts of spindle cells, whereas the distal samples showed a heterogenous cell-rich tissue with more lining endothelium and numerous small vessels. Nestin positive single cells were detected more often in proximal lesions within thromboembolic material. Nestin positive endothelial cells both of the neointima and in recanalized vessels were found more often in distal lesions of PA.

Conclusions

For the first time nestin expressing cells were evaluated in PEA samples from CTEPH patients. These cells may represent precursor cells of endothelial or mesenchymal origin, such as premyofibroblast-like progenitor cells as well as transitional cells within endothelial-mesenchymal transition. These findings could open innovative perspectives to answer the crucial question if these cells are part of the pathophysiological cascade in CTEPH. Furthermore, it is important to clarify the origin of nestin-positive cells and the potential loss of their nestin-expression during cell differentiation.