Abstract: P179

The role of circulation CD271-positive cells in peripheral blood for pulmonary hypertension

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Aims
CD271, low-affinitive neurotrophins receptor, has been emerged as a cell surface marker of multipotent mesenchymal stem cells (MSCs). Recently, circulating CD271+MSCs in Peripheral Blood (PB) were reported to be associated with the progression of vascular remodeling of coronary artery following acute myocardial infarction. Pulmonary vascular remodeling including changes in the intima, media and adventitia, is the key structural alteration in PH. However, the role of CD271+MSCs in the pathogenesis of pulmonary hypertension (PH) are not well understood. Our objectives were to identify the role of CD271+MSCs in PB on the Patients diagnosed with PH.

Methods
We selected patients diagnosed with PH, and examined their hemodynamic parameters including pulmonary vascular resistance (PVR), mean pulmonary artery pressure (mPAP) and cardiac index (CI) by right heart catheterization. We also measured six minutes walking (6MWT), and enforced echocardiography and blood gas analysis. Secondly, we collected blood samples and separated PB mono-nuclear cells (PBMNCs) by density gradient centrifugation. Then, we performed cell surface antigen analysis, such as CD271+CD45dim+, CD271+CD34+, CD271+CD90+, and CD271+VEGFR2+ cells in PBMNCs by flow cytometry. We compared clinical data and the frequency of CD271+MSCs in PBMNCs of patients with pulmonary hypertension. Moreover, nine patients could be followed along clinical course with drug addition in 24 months. We tried to analyze transition of the CD271+MSCs in PBMNCs and compared those change with clinical data.

Results
We selected 22 patients who matched PH criteria (group 1; n=8, group 4; n=8). The mean of WHO functional class was 2.14, and mPAP was 38.9±10.1mmHg. The average frequency of CD271+CD45dim+ in PBMNCs (0.0459±0.0376%), was higher in the patients with PH than those in patients with atrial fibrillation (n=4), angina pectoris (n=15), and healthy control (n=5) (P<0.05). We also found that the frequency of CD271+MSCs in PBMNCs was correlated with PVR, CI, and SPO2 (P<0.05). On the other hands, that wasn’t correlated with 6MWT and mPAP.

Interestingly, the frequency of CD271+MSCs in PBMNCs was significantly reduced along with improving PH after medical intervention in 2-24 months follow up (P<0.05).

Conclusion
These results suggest that CD271+MSCs in PBMNCs, derived from bone marrow to circulation, associated with the disease worsens in the case of PH. The frequency of CD271+MSCs in PBMNCs might be useful for estimation of disease severity and prognosis in PH patients.