Comorbidities in Obstructive Lung Disease in Korea; Data from the Fourth and Fifth Korean National Health and Nutrition Examination Survey

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Background: Comorbidities can occur frequently in patients with airflow obstruction and influence mortality and morbidity independently, deserve specific treatment. It is increasingly recognized that many patients with chronic obstructive lung disease (COPD) have comorbidities that have a major impact on quality of life and survival.

Methods: We used data obtained in the six years (2007-2012) of the Fourth and Fifth Korean National Health and Nutrition Examination Survey [KHNAMES IV-V]. Among 50,405 subjects, 16,151 subjects aged over 40 years who performed spirometry adequately were included in this study. Airway obstruction was defined as FEV1/FVC<0.7, and GOLD stage was used to evaluate the severity of airway obstruction. The statistical analyses were carried out using SAS 9.2 (SAS Institute Inc.).

Results: Of all 16,151 subjects (43.2% male; 56.8% female), the mean age was 57.1 years for men and 57.2 years for women. Among them, 13.1% had obstructive lung function, 11.3% had restrictive lung function, and 75.6% were normal lung function. Among these COPD patients, 34.3% performed exercise training using elastic bandage, breathing retraining (diaphragmatic and pursed lip breathing), device training for secretion management using acapella, flutter, PEP device, and VEST, and inflow influence mortality and morbidity independently, deserve specific treatment. So we tried a different route of stem cell infusion via intra-pleural route and evaluated the effect of adipose-derived stem cells via intra-pleural infusion in elastase-induced emphysema mice.

Methods: Mouse emphysema model was developed in C57BL/6 mice with the intratracheal injection of elastase (0.4 units/mice), 1×10^5 supo/sec of ASCs were infused via intra-pleural route at 1week after elastase injection in C57BL/6 mice. Histological analysis of lung tissue was performed with the measurement of mean linear intercept (MLI) at 1week after ASCs intra-pleural infusion.

Results: Elastase induced emphysema in these mice model (mean standard deviation of MLI: 122±17 μm, n=4 for elastase-injected mice, n=4 vs. control mice, n=2) We observed the restoration of alveolar destruction by the infusion of adipose-derived stem cells via intra-pleural route in elastase-induced emphysema mice (MLI for ASCs-treated mice vs. control mice, 89±4 μm, n=4 vs. only elastase-injected mice 122±17 μm, n=4, p=0.0286).

Conclusions: Intra-pleural route may be a candidate route of the stem cell treatment for lung diseases.