The unique changes of lung microbiome in chronic lung allograft dysfunction

Hye Ju Yeo¹, Woo Hyun Cho¹, Dohyung Kim³, Yun Hak Kim², Yeuni Yu²

¹Department of Internal Medicine-Pulmonary, Pusan National University Yangsan Hospital, Busan, Korea

²Department of Anatomy, Pusan National University School of Medicine, Busan, Korea

³Department of Thoracic and Cardiovascular Surgery, Pusan National University Yangsan Hospital, Yangsan, Korea

Background: Both unique bacterial populations and longitudinal changes in the lung microbiome may play a critical role in the development of chronic lung allograft dysfunction (CLAD).

Methods: We evaluated the difference in lung microbiome associated with CLAD through the lung microbiome analysis of the donor's lung at the time of transplantation and after CLAD occurrence.

Results: A significant change of bacterial diversity was observed in the lung microbiomes of CLAD compared to at the time of transplantation. Depending on the severity of CLAD, the bacterial diversity tended to decrease. In all lung microbiomes, Actinobacteria, Firmicutes, and Proteobacteria were highly abundant and account for approximately 75% of the total bacterial community. *Pseudomonas*, *Xanthomonas*, *Bacillus*, *Pasteurella*, and *Rhodococcus* occupied a large proportion. Compared to the time of transplantation, more *Klebsiella* was observed in lung microbiomes of CLAD. Genera such as *Aerococcus*, *Caldiericum*, *Croceibacter*, *Leptolyngbya*, and *Pulveribacter* were uniquely identified in CLAD, whereas there were no taxa identified at time of transplantation. In particular, seven taxa including *Croceibacter atlanticus*, *Caldiericum exile*, *Dolichospermum compactum*, *Stappia* sp. ES.058, *kinetoplastibacterium sorsogonicusi*, *Pulveribacter suum* were identified uniquely in CLAD.

Conclusions: Compared to the point of transplantation, the change of bacterial diversity in the lung microbiomes of CLAD was observed, and the seven taxa were uniquely identified in CLAD.

Corresponding author: Hye Ju Yeo

E-mail: dugpwn@naver.com

© The Korean Society for Transplantation

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.