Accepted Manuscript

The Effect of Chronic Pulmonary Disease and Mechanical Ventilation on Corneal Donor Endothelial Cell Density and Transplant Suitability

Jordan A. Margo, Martha F. Whiting, Clayton H. Brown, Caroline K. Hoover, Wuqaas M. Munir

PII: S0002-9394(17)30377-X

DOI: 10.1016/j.ajo.2017.08.023

Reference: AJOPHT 10248

To appear in: *American Journal of Ophthalmology*

Received Date: 21 June 2017

Revised Date: 25 August 2017

Accepted Date: 31 August 2017

Please cite this article as: Margo JA, Whiting MF, Brown CH, Hoover CK, Munir WM, The Effect of Chronic Pulmonary Disease and Mechanical Ventilation on Corneal Donor Endothelial Cell Density and Transplant Suitability, *American Journal of Ophthalmology* (2017), doi: 10.1016/j.ajo.2017.08.023.

Abstract

Purpose: To determine how chronic obstructive pulmonary disease (COPD) and mechanical ventilation time affect corneal donor endothelial cell density (ECD) and transplant suitability.

Design: Retrospective cohort study

Methods:
Setting: institutional
Study Population: 39,679 cornea donor eyes from SightLife Eye Bank between 2012-2016. Demographics, death to preservation time, ECD, lens status, medical history, time on mechanical ventilation, and suitability for transplantation were included.
Main Outcome Measures: ECD and transplant suitability.

Results: Mean ECD was 2,733 cells/mm^2. Mean age was 59 years old. COPD affected 34.2% of donors. Mechanical ventilation was required in 35% of donors. Mean ventilation time was 1.3 days. After controlling for co-variates, COPD was not found to be associated with poor transplant suitability ($p = 0.22$). Ventilation > 7 days was associated with poor transplant suitability ($p=0.04$). Donors with COPD and donors who were mechanically ventilated exhibited lower cell counts ($p<0.001$, $p<0.01$ respectively). Longer ventilation led to reduced endothelial cell density: Ventilation time >7 days (-46.5 cells/mm^2, $p<0.001$) and >30 days (-101.4 cells/mm^2, $p=0.02$). Limitations of the study included the retrospective nature, dataset obtained from a single eye bank, and medical history documentation completed by eye bank technicians.

Conclusions: A high proportion of cornea donors have respiratory disease prior to donation. Ventilation time >7 days affected transplant suitability but the presence of COPD did not. Donors with COPD and donors who were mechanically ventilated had reduced cell counts. Longer ventilation times lead to increased cell loss. The presence of respiratory disease may affect tissue oxygenation, and endothelial cell health.