Early Detection of Ureaplasma Lung Allograft Infection by a Positive Transpulmonary Ammonia Gradient

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Introduction: In 2015 the previously considered idiopathic hyperammonemia syndrome in the early period after lung transplantation was identified to be caused by a donor derived allograft infection with urease producing bacteria (mollicutes: ureaplasma and mycoplasma). We present a case of a post-lung transplant patient in whom a positive transpulmonary ammonia gradient allowed for the early detection and treatment of a later confirmed ureaplasma allograft infection.

Case discussion: A 64-year-old male status post lung transplant for idiopathic pulmonary fibrosis was found to be more somnolent while weaning sedation on mechanical ventilation than would be expected on post operation day four. On exam pupils no focal neurological deficits were noted. He could followed simple commands but appeared fatigued and somewhat distractible. Electrolytes were within normal limits and a central venous ammonia level was 36 umol/L; however, a paired arterial ammonia level was 56 umol/L. This indicated a venous-arterial ammonia gradient of 20 umol/L (normal gradient 0 umol/L). A broncho-alveolar lavage (BAL) was obtained and sent for mollicute culture and polymerase chain reaction (PCR) testing. He was empirically started on Ciprofloxacin and Azithromycin. Three days after sending the BAL for ureaplasma PCR the result became available and was positive, confirming an allograft infection with ureaplasma. He finished a treatment course with antimicrobials with full resolution of the ureaplasma infection.

Discussion: Lung transplant recipients are at risk for hyperammonemia secondary to an allograft infection with mollicutes. The infection is a donor derived allograft infection with mollicutes. Mollicutes have the enzyme urease and therefore hydrolyze urea to generate adenosine triphosphate, a reaction that also produces ammonia .Historically hyperammonemia after lung transplantation was associated with a high risk of mortality. Early identification and treatment of a mollicute infection with macrolides +/- fluoroquinolones leads to the resolution of the infection and source of the ammonia and good patient outcomes. This case highlights the early detection of a ureaplasma allograft infection by a positive transpulmonary ammonia gradient. This allowed the detection of a ureaplasma allograft infection 3 days before PCR testing results became available to confirm the infection. Most importantly this early detection allowed for early treatment, so that systemic ammonia levels never became significantly elevated. ¹Clin Transplant. 2017May;31(5).doi:10.1111/ctr.12957

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