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HIGH FLOW OXYGEN THERAPY FOR COMBINED INFLUENZA AND CYTOMEGALOVIRUS PNEUMONIA IN IMMUNOCOMPROMISED PATIENT

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Objective: Introduction
High flow oxygen therapy (HFOT) is a form of respiratory support which has been increasingly used to treat hypoxaemic acute respiratory failure (ARF). It delivers high flow of heated and humidified medical gas with constant fraction of inspired oxygen (FiO2), generates a low level of positive pressure and provides washout of dead space in the upper airways, thereby improving mechanical pulmonary properties and unloading inspiratory muscles during ARF. We report the case of an immunocompromised patient admitted to the intensive care unit due to combined influenza and cytomegalovirus pneumonia and subsequent severe ARF successfully treated with HFOT.
Case report
56 years old male underwent bilateral lung transplantation in June 2018 due to alpha-1 deficiency-related emphysema. Since both donor and recipient CMV serostatus was positive, CMV prophylaxis was ceased six

months after transplantation. In January 2019, he presented with severe dyspnea and fever (38.5^{0}C). Physical examination revealed quiet breathing sound and fine crackles over the right lung. Erythrocyte sedimentation rate was 82 mm/h, red blood cell count 3.66×1012/L, hematocrit 0.316, platelet count 421×109/L, white blood cell count 17.4×109/L (eos 9%, ne 82%, ly 2.9%,Mo 6.1%), C-reactive protein 81 mg/L. Chest- X-ray showed infiltrates of right lower and left upper pulmonary lobe. Thoracic CT unveiled ground-glass opacity of the left upper pulmonary lobe and right lung. Transbronchial lung biopsy discovered inclusions indicative of influenza virus. 23 400 IU/mL of CMV DNA copies were found in bronchoalveolar lavage sample using PCR. Patient was treated by oseltamivir, ganciclovir, piperacilin-tazobactam, azithromycin. Immunosuppressive agents were reduced. In order to correct hypoxaemic respiratory failure, 6 L/min of oxygen through oxygen mask was introduced. Because of the failure to correct hypoxemia, HFOT was applied with an inspiratory flow of 35 L/minute, temperature of 31oC, and FiO2 of 40%. A significant clinical improvement was observed as evidenced by the patient's ventilatory mechanics, arterial oxygenation, SaO2 of 94% and decreasing respiratory rate. Arterial blood gas analysis subsequently showed: pH 7.45, PaO2 65 mmHg, PaCO2 34 mmHg, HCO3- 23 mmol/L, SpO2 93.5%.

Conclusion
HFOT resulted in significant improvement of the patient respiratory function when compared to conventional oxygen therapy using the oxygen mask. It is feasible, well tolerated and safe treatment modality able to improve oxygenation and alleviate symptoms of respiratory distress.