Abstract

Combining oxygen therapy with aerosol delivery within High flow nasal cannula oxygen therapy (HFNC) is an attractive practice. Delivered dose (DD) was found to decrease with increasing gas flow rates and with smaller sized cannulas. The aim of this study was to quantify amount of aerosol emitted at the cannula outlet using different aerosol generators at low oxygen flow.

Aerogen Solo vibrating mesh (SOLO), jet nebulizers, Combihaler connected to metered dose inhaler(MDI) and SOLO, MDI connected AeroChamber Vent and MDI connected AeroChamber Mini were used to deliver aerosol in HFNC in-vitro setting. SOLO with its T-piece delivers DD~35% of nebulizer charge with high fine-particle-dose (FPD). Both Combihaler and jet-nebulizer delivered~18% with lower FPD. MDI with both spacers delivers only 2.1 and1.3% of nominal dose, respectively. Mass median aerodynamic diameters were small for the SOLO, Combihaler and jet nebulizers and high for the two spacers.

Inhaled aerosols can be delivered efficiently at low oxygen flow using SOLO, with both T-piece andCombihaler, and jet nebulizer in HFNC system. While MDIs with spacers delivers negligible amounts of drug below that expected for clinical response at this flow.