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**Title:** Effectiveness of the use of heliox on nebulizer associated with noninvasive ventilation in chronic obstructive pulmonary disease patients: A randomized controlled trial

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**Body:** Objective: To evaluate the efficacy of nebulized bronchodilators carried by heliox associated with NIV in the pulmonary deposition of radioaerosol in patients with stable COPD. Methods: A randomized controlled trial involving 37 patients divided into four groups: heliox NIV, oxygen NIV, heliox and oxygen. For scintigraphy pulmonary inhalation dose was administered a dose of dietilnotriaminopentaacético acid labeled with technetium(99mTc-DTPA- 25 mCi) combined with fenoterol bromide(0.12 mg) and ipatropium bromide(0.25 mg) delivered through a bi-level noninvasive ventilation system using a face mask with two unidirectional valves and connected to the nebulizer for radioisotopes(IPAP = 10 cm H<sub>2</sub>O and EPAP=8 cm H<sub>2</sub>O). Images were acquired immediately after the intervention using a Gama camera and Regions of interest was determined. Results: There was a higher radioaerosol pulmonary deposition in the lower third in the heliox NIV and oxygen NIV groups compared to oxygen group(p=0.03 and p=0.02, respectively). We observed a higher deposition in the middle third(p=0.008) in heliox NIV group when compared to O<sub>2</sub>. Thus, there was a positive correlation gain in inspiratory capacity(IC) and the total area of the right lung(p=0.04, r=0.71) in the heliox NIV group. Conclusion: Our results suggest that coupling heliox or oxygen with bi-level NIV reached a higher lung radioaerosol deposition in the lower third for both lungs. The association between heliox and NIV seem to be more effective to promote a higher radioaerosol peripheral deposition considering the gain of the IC. Supported by: CAPES NF, CNPq, FACEPE.