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Title: Assessment of two methods to withdraw non-invasive ventilation in acute hypercapnic respiratory failure

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Body: INTRODUCTION: No studies are available assessing the best method for withdrawing non-invasive ventilation (NIV) after an episode of acute hypercapnic respiratory failure (AHRF). We assessed if the prolongation of nocturnal ventilation after an AHRF could prevent new episodes of respiratory failure after NIV withdrawal compared to a strategy of direct discontinuation of NIV without additional nocturnal support. METHODS: A randomized controlled study was performed in 128 patients who presented an AHRF at admission and initiate NIV. When the AHRF was resolved and patients tolerate spontaneous breathing during 4 hours, they were randomly allocated to receive 3 additional nights of NIV (n=64) or conventional oxygen therapy (control group, n= 64). The primary outcome was avoidance of respiratory failure after NIV withdrawal. RESULTS: Patients of both groups presented similar baseline characteristics, being COPD the main chronic respiratory disorder (74%). Patients from nocturnal NIV group received NIV longer than the control group (5 ± 2 vs 3 ± 4 ; $p<0.001$). No differences between groups were observed in terms of respiratory failure after NIV withdrawal, hospital stay, readmission or mortality. CONCLUSIONS: The prolongation of NIV during 3 nights after an episode of AHRF does not seem to improve prognostic outcomes, and consequently NIV could be directly withdrawn when the acute episode is resolved and patients tolerate spontaneous breathing in AHRF. Supported by: FUCAP and CibeRes-ISCiii-CB06/06/0028.