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Title: Effectiveness of non-invasive ventilation in stable chronic obstructive pulmonary disease with nocturnal desaturation: Prospective open-label randomized parallel-group study

Dr. Vera 30319 Baturova verabaturova@gmail.com ¹, Dr. Elena 30320 Zolotova zolotova1965@mail.ru ¹, Dr. Alexey 30321 Svet alyoshic.svet@facebook.com ², Dr. Alexey 30322 Nesterov drcor@mail.ru ² and Dr. Kira 30323 Dalgatova kira_1975@mail.ru ³. ¹ Pulmonary Department, 63 City Clinical Hospital, Moscow, Russian Federation ; ² Intensive Care Unit, 63 City Clinical Hospital, Moscow, Russian Federation and ³ Cardiology Department, 63 City Clinical Hospital, Moscow, Russian Federation .

Body: In some patients with chronic obstructive pulmonary disease (COPD) hypoventilation occurs nightly, leading to a nocturnal desaturation pulseoximetry pattern. Hypoxemia with SpO₂≤88% due to alveolar hypoventilation is associated with the disease progression rapidity and health-related quality of life (HRQOL) deterioration. This suggests better outcomes and HRQOL in COPD patients with nocturnal desaturation receiving non-invasive ventilation (NIV), when compared to standard COPD therapy. The aim of our study was to estimate the effectiveness of nocturnal NIV on the long-term outcomes of COPD with night-time desaturation. We conducted an overnight pulseoximetry in 45 stable COPD patients and enrolled 25 patients with persistent nocturnal desaturation with basal SpO₂≤88%. We then randomized the sample and prescribed NIV in addition to standard therapy to the treatment group (n=11) vs. standard therapy (n=14) for 6 months. Stable COPD patients with nocturnal desaturation receiving NIV in addition to the standard therapy didn't declare higher HRQOL, when assessed by SF36 scores (PH 43.6±9.2, MH 44.9±6.7 vs. PH 45.9±9.9, MH 39.5±4.7). In stable COPD patients with nocturnal desaturation the addition of NIV was associated with lower exacerbation rate within 6-month period (0.11 vs. 0.39 exacerbations per patient) and longer time to a subsequent exacerbation by Kaplan-Meier test (p<0.05). The supplement of overnight NIV to standard therapy in stable COPD with nocturnal hypoxemia isn't associated with substantial improvement in HRQOL, but reduces exacerbation rate and increases time to a subsequent exacerbation.