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Title: Impact of long-term target-volume noninvasive positive pressure ventilation on sleep quality

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Body: Objective: Target-volume noninvasive positive pressure ventilation (TV-NPPV) was introduced to combine the advantages of volume- and pressure-preset NPPV. However, diverging results have been reported regarding a deterioration of sleep quality due to pressure variation. Methods: 12 COPD-patients on long term high-intensity NPPV (HI-NPPV) were switched to TV-NPPV for 10 weeks. Sleep quality and overnight gas exchange were analyzed at run-in during HI-NPPV and after 10 weeks of TV-NPPV. Two TV-NPPV-settings were tested overnight in a randomized order: 8ml/kg ideal body weight (TV1) versus 110% of individual tidal volume analyzed during familiar HI-NPPV (TV2). Inspiratory pressures were set to -5mbar (of HI-NPPV) up to 35mbar. TV-NPPV-settings reflecting the lower overnight transcutaneous PCO2-values ($PtcCO_2$) were chosen for long-term TV-NPPV. Results: 10 patients completed the study, 2 patients refused to complete the trial using TV2-NPPV at home. Mean overnight $PtcCO_2$ was similar during HI-NPPV and TV-NPPV (both 45±5mmHg), p=0.75. In addition, no difference was found comparing sleep quality by polysomnography regarding sleep efficiency, sleep stages, total sleep time, arousal index, apnoe-hypopnea index or oxygen saturation. Conclusion: After 10 weeks of TV-NPPV at home no differences regarding sleep quality or overnight $PtcCO_2$ were observable compared to conventional HI-NPPV.