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Title: Treatment of central and obstructive sleep apnea in stable heart failure patients with auto-servo ventilation reduces sleep fragmentation – A randomized controlled trial

Prof. Michael 18367 Arzt michael.arzt@ukr.de MD [1], Prof. Frederic 18368 Series Frederic.Series@fmed.ulaval.ca MD [2], Prof. Keir 18369 Lewis keir_lewis@hotmail.com MD [3], Dr. Amit 18379 Benjamin amitbenja1@hotmail.com MD [3], Prof. Pierre 18380 Escourrou pierre.escourrou@abc.aphp.fr MD [4], Mrs. Ruth 18382 Luigart ruth.luigart@ukr.de [1], Dr. Christoph 18390 Birner christoph.birner@ukr.de MD [1] and Prof. Michael 18417 Pfeifer michael.pfeifer@ukr.de MD [1,5]. [1] Department of Internal Medicine II, Division of Respirology, University Hospital, Regensburg, Germany ; [2] Centre de Recherche, IUCPQ, Universite Laval, Quebec, Canada ; [3] Department of Respiratory Medicine, Prince Philip Hospital and Swansea College of Medicine, Wales, United Kingdom ; [4] Centre de Medicine du Sommeil, Hopital Antoine Beclere, Clamart, France and [5] Center for Pneumology, Donaustauf Hospital, Donaustauf, Germany .

Body: Background: It is of debate, whether treatment of central sleep apnea (SA) reduces sleep fragmentation. Therefore, we tested, whether auto-servo ventilation (ASV, BiPAP-ASV, Philips Respironics) reduces sleep fragmentation in heart failure (HF) patients with severe central or obstructive SA. Methods: 42 patients with HF (age 66±9y, LVEF <40%) and SDB (apnea-hypopnea index, AHI 48±19/h, 51% central SA) were randomized to either ASV (n=21) or optimal medical treatment alone (control, n=21). Polysomnography (PSG) and 5 days of actigraphy with centralized scoring by blinded raters were obtained at baseline and 12 weeks. Results: In the ASV-group AHI and central AHI were significantly suppressed compared to the control-group (-40±16 versus -1±13/h, p<0.001 and -24±14 versus +1.7±10/h, p<0.001, respectively). The arousalindex (ArI), sleep stage 1 (S1, PSG) and the fragmentation index (actigraphy) were significantly reduced (-14.7±21.3 versus 2.6±13.3/h, p=0.032 and 36±47 versus -6±41 min, p=0.005, and -11.4±16.0 versus -2.9±9.4/h, p=0.002, respectively) and sleep efficiency (SE) and daytime activity duration (actigraphy) significantly increased in the ASV-group compared to controls (5.5±10 vs. 1.6±6.9/h, p=0.021 and 14±54 vs. -24±41 min, p=0.009, respectively). Effects of ASV on ArI, S1, SE and daytime activity duration were similar in HF patients with obstructive and central SA (p>0.05 for all comparisons). Conclusions: ASV-treatment significantly improves sleep fragmentation similarly in HF-patients with either central or obstructive SA. These effects were associated with a modest increase of daytime activity duration.