European Respiratory Society
Annual Congress 2013

Title: Reliability of the apnoea-hypopnoea index (AHI) reported by ventilator software in patients with obesity hypoventilation syndrome (OHS) treated with long-term noninvasive ventilation (NIV)

Dr. Marjolaine 24535 Georges marjolaine.georges@wanadoo.fr MD [1], Dr. Dan 24536 Adler dan.adler@hcuge.ch MD [2], Dr. Olivier 24537 Contal olivier.contal@hcuge.ch [2], Mr. Fabrice 24538 Espa fabrice.espa@hcuge.ch [3], Prof. Jean-Louis 24539 Pépin jpepin@chu-grenoble.fr MD [3,4] and Prof. Jean-Paul 24569 Janssens jean-paul.janssens@hcuge.ch MD [2]. [1] Service De Pneumologie Et Réanimation Respiratoire, Centre Hospitalier Et Universitaire De Dijon, Dijon, France, 21000 ; [2] Divsion of Pulmonary Diseases, Geneva University Hospitals, Geneva, Switzerland, 1211 ; [3] Sleep Laboratory, Department of Psychiatry, Geneva University Hospitals, Geneva, Switzerland, 1211 and [4] INSERM U1042, HP2 Laboratory, Faculté De Médecine Et Centre Hospitalier Universitaire De Grenoble, Grenoble, France, 38000 .

Body: Background: Patients under NIV may develop undesirable respiratory events which can affect NIV efficacy. Polysomnography (PSG) is considered as the gold standard for monitoring patients with NIV. However it is expensive and not always available. The reliability of estimation of the apnoea-hypopnoea index (AHI) by built-in ventilator software has not yet been studied. The objective aim of this study was to compare the AHI retrieved by PSG vs data provided by ventilator software (VPAP III$_{STA}$, ResMed, Australia). Methods: Ten stable patients with OHS under home NIV underwent PSG on 3 consecutive nights with 3 different ventilator settings in random order: no, low and high backup respiratory rate. Impact of these changes on nocturnal respiratory events has been recently published. Data memorized by ventilator software was retrieved for each recording and compared with PSG. Results: Analysis was performed on 27 tracings. AHI$_{PSG}$ was significantly higher than AHI$_{NIV}$ (35±5 vs. 30±4) but both measurements were highly correlated (r=0,95, p<0,001). Mean bias was 6,5±9,9 events per hour (limits of agreement: -13,3; 26,4). Using an arbitrary threshold of 10/hour for AHI, ventilator software identified subjects with an abnormal residual AHI with a sensitivity of 95%, a specificity of 100%. However, in these tracings, leaks were minimal as well as patient/ventilator asynchrony. Conclusions: In patients under long-term NIV for OHS, the automated detection algorithm of the VPAP-III$_{STA}$ device correctly classified patients as having or not an abnormal number of residual respiratory events when compared to PSG.