

# ROLE OF POLYSOMNOGRAPHY IN ASSESSMENT OF NONINVASIVE VENTILATION IN ALS PATIENTS

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## INTRODUCTION

Respiratory weakness in patients with ALS causes dyspnoea and orthopnea, but can also present only with symptoms of nocturnal hypoventilation (1, 2, 3). Clinical symptoms and signs along with pulmonary function tests may not be sensitive enough (forced vital capacity) or not in routine assessment (sniff nasal pressure) to recommend starting noninvasive ventilation (1). As sleep disturbance may be one of the earliest signs of respiratory insufficiency in ALS patients the aim of our study was to perform the whole-night polysomnographic (PSG) recording to objectively assess the effectiveness of noninvasive ventilation on sleep.

## METHODS

One hundred and twenty-four ( $n = 124$ ) patients with ALS were followed in our ALS Center from October 2002 to July 2008. They were seen at regular 3 months intervals when symptoms and signs of respiratory insufficiency were searched for and forced vital capacity and/or arterial blood gases were measured. When the first symptoms or signs of respiratory insufficiency appeared the noninvasive respiration was discussed and PSG was recommended.

## RESULTS

In 34 (27%) of our patients (38% with bulbar onset, 2 pts with family history of ALS) overnight PSG was performed. In 20 patients sleep architecture was disrupted together with night hypoventilation and the use of noninvasive ventilation was indicated. 19 patients accepted BiPAP and underwent the second overnight PSG using the noninvasive ventilation (mean time from diagnosis to noninvasive ventilation was 32

months in pts with spinal and 28 months in pts with bulbar form). However only 7 patients (5.6% (5 pts with bulbar and 2 pts with spinal form)) tolerated the BiPAP well and used it on a regular basis (more than 4 hours per night). In these patients ( $n = 7$ ) better sleep architecture with more slow wave sleep ( $27 \pm 0.02$  min/ $52 \pm 0.02$  min ( $p = 0.07$ )) and longer REM sleep ( $10 \pm 0.00$  min/ $33 \pm 0.01$  min ( $p = 0.002$ )) with less night oxygen desaturation (mean  $\text{SaO}_2$  ( $91 \pm 0.03\%/94 \pm 0.01\%$  ( $p = 0.02$ )) were found. Patients using BiPAP also reported better sleep quality and less daytime sleepiness.

## CONCLUSION

PSG objectively shows disruption of sleep architecture as one of the earliest signs of respiratory insufficiency in ALS patients. It may help in identification of early respiratory impairment and assess effectiveness of noninvasive ventilation therapy.

## References:

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