European Respiratory Society
Annual Congress 2013

Abstract Number: 741
Publication Number: 3046

Abstract Group: 4.2. Sleep and Control of Breathing
Keyword 1: Sleep disorders Keyword 2: Animal models Keyword 3: Hypoxia

Title: Chronic intermittent hypoxia reduces progressive sperm motility in a mouse model of obstructive sleep apnea

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Body: Introduction: Obstructive sleep apnea (OSA) is characterized by intermittent hypoxemia and oxidative stress. However, whether intermittent hypoxemia translates into hypoxia/reoxygenation at testicular tissue level is unknown. This information is of interest since it has been shown that oxidative stress stimuli other than intermittent hypoxia reduce male fertility. The aim of this study was to use a mouse model of recurrent hypoxia to measure the local changes induced in tissue oxygen partial pressure (PtO2) in testicles and to test the hypothesis that progressive sperm motility is reduced by chronic intermittent hypoxia. Methods: Testicular PtO2 was measured with a modified Clark’s polarographic micro-electrode pipette in 4 anesthetized mice subjected to intermittent hypoxia mimicking OSA (20 s at 5 % O2, 40 s at 21 % O2). Arterial oxygen saturation (SaO2) was measured by pulseoximetry. Progressive sperm motility was measured by conventional seminogram in 10 mice chronically subjected to the hypoxic pattern at a rate of 6 h/day for 34 days and in 10 control mice. Results: SaO2 swings ranging from 94.7± 1.2 % (m ± SE) to 59.1 ± 4.6 % (p<0.001) induced swings of testicular PtO2 ranging from 10.9 ± 1.8 mmHg to 3.1 ± 1.6 mmHg (p=0.029). Progressive sperm motility was significantly (p < 0.04) reduced from 31.5 ± 3.5 % in controls to 22.9 ± 1.8 % in mice subjected to chronic intermittent hypoxia. Conclusion: Intermittent hypoxia mimicking OSA induced tissue hypoxia/reoxygenation in the testicle and resulted in a decrease of a relevant spermatic index of male fertility. These results suggest that intermittent hypoxia per se could promote fertility reduction in male OSA patients.