367. Cardiovascular disease and sleep-disordered breathing

3285 Prediction of cardiovascular risk from nocturnal pulse wave signal using the autonomic state indicator technology
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Introduction: Analysis of continuous physiological signals measured by pulse oximetry during sleep may provide a novel method to assess cardiovascular (CV) risk. The sleep period appears to be a particularly useful window for assessment.

Methods: Subjects (n=520, 346 males, age 55.0±13.4 years, BMI 29.9±1.6 kg/m²) were referred to five sleep centers in Germany and Sweden. CV risk factors were assessed and subjects were classified by the ESC/ESH risk model into five separate risk classes. The autonomic state indicator (ASI) algorithm extracted patterns of the peripheral pulse wave and SpO₂ signal by amplitude and time/frequency analysis from the overnight digital photoplethysmographic recording and computed a CV risk score (range 0.1 – 0.5 equals to high risk). Nine derived parameters (irregular pulse, RDCD, pulse variability, wave pulse variability, pulse propagation time, oxygen desaturations, duration of periodic symmetric desaturations and baseline SpO₂) were used to determine the final score.

Results: In the validation group (n=390), the developed algorithm detected high CV risk (ESC/ESH scores 4 and 5) and patients with a sensitivity of 74.5% and specificity of 76.4%. The area under the ROC curve was 0.80. The ASI CV risk score was elevated in patients with an already established CV endpoint (MI and/or stroke, n=50) compared with all other patients (0.73±0.27 vs. 0.42±0.34, p<0.001).

Conclusions: The ASI technique appears to provide a possibility to detect increased CV risk from a recording of physiological signals during sleep. The technique – based on a modified pulse oximeter – may be useful in both sleep and cardiovascular medicine.

3286 Mortality in heart failure patients with nocturnal Cheyne-Stokes respiration receiving adaptive servoventilation (ASV) therapy
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Introduction: We evaluated data from a post-marketing surveillance study on the use of adaptive servoventilation (ASV) therapy for the treatment of Cheyne-Stokes respiration (CSR) in heart failure (HF) patients who had been treated with conventional treatments.

Methods: Out of 269 patients treated with ASV therapy, 219 were included in the post-marketing surveillance study. Of these, 186 patients (NYHA class II, EF ≥ 45%) were followed for a median of 11 years. Mortality was assessed as the primary endpoint.

Results: Mortality in the ASV group was significantly lower than in the control group (13.1% vs. 23.4%, p<0.001). The hazard ratio for mortality was 0.57 (95% CI: 0.38-0.87, p<0.001). The 5-year survival of patients treated with ASV was 87%, compared to 78% in the control group. The 10-year survival was 72% in the ASV group and 57% in the control group.

Conclusions: Adaptive servoventilation therapy is a safe and effective treatment for nocturnal Cheyne-Stokes respiration in heart failure patients. Further research is needed to determine the long-term benefits of this therapy.
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Impact of CPAP treatment on the changes of max-k+ channel beta subunit-I expression in patients affected by sleep apnea-hypopnea syndrome (SAHS)
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Abstract:
Impact of CPAP treatment on the changes of max-k+ channel beta subunit-I expression in patients affected by sleep apnea-hypopnea syndrome (SAHS)

Purpose: To determine the relations between oxymetric and endothelial situation and subunit beta1 expression in the moment of recruitment and after 3 month of CPAP in SAHS patients.

Methods: Prospective study in SAHS patients with CPAP (3 months). SAHS was defined as an apnea-hypopnea index (AHI) ≥ 15 (cardiorespiratory polygraphy). Endothelial function was evaluated with a test of postocclusive hyperemia by Laser-Doppler flowmetry. Beta1-subunit mRNA expression was made by a blood test in peripheral blood leukocytes. This two determinations were repeated 3 months after CPAP, calculating the parameter beta1b-beta1a.

Results: 33 patients were enrolled with 66,7% males. Polygraphy showed a mean AHI of 61±25,8, desaturation index 60±25, nocturnal saturation 89,45±6,8%, minimum nocturnal saturation 53,87±20,3, and CT90 of 31,3±22,7%. When investigating the parameter beta1b-beta1a we found a negative correlation with: mean AHI (R= -0,3, p=0,02), minimum nocturnal saturation (%) (R= -0,4, p=0,01) and area under the curve (PUs) (R= -0,46, p=0,01) and a positive correlation with CT90 (R=0,3, p=0,04) and the slope (PUs) (R=0,4, p=0,001).

Conclusions: In our study population individuals showing worst oxymetric parameters or basal vascular endothelial situation initially achieved after 3 month of CPAP the most important improvement of beta1 subunit levels (expressed as higher values in the difference beta1b-beta1a).

3291
Acetazolamide improves cardiac dysrhythmias in patients with obstructive sleep apnea at altitude. A randomized controlled trial
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Treatment of central and obstructive sleep apnea in stable heart failure patients with auto-servo ventilation reduces sleep fragmentation – A randomized controlled trial
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Abstract:
Treatment of central and obstructive sleep apnea in stable heart failure patients with auto-servo ventilation reduces sleep fragmentation – A randomized controlled trial

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