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# Turkish Society of Physiological Sciences

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**PC115**

## The Relationship Between Chiari Malformation Type 1 and Sleep Electrophysology

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AIM: Chiari Type 1 Malformation (CM1) is a craniovertebral junction pathology which is commonly observed in neurosurgical practice. CM 1's relation with sleep disorder have been shown in some cases. Furthermore in some surgically treated CM 1 cases, coexisting sleep apnea symptoms have been shown to be improved. The aim of this studys is to evaluate the neurophysiological changes of sleep activity, in CM 1 cases pre and postoperatively and consequently, the effect of treatment on the integrity of central nervous system.
METHODS: A group of voluntiers have been involved in this study (10 CM 1 cases, 8 women, 2 men, Ages 20-50, BMI:22,5-44). The two male voluntieers' had serious obstuctive sleep apnea syndrome. The volunteers sleep electrophysological studies have been performed preoperatively any 2nd month postoperatively. The operation procedures were similiar for all cases. Decompressive posterior craniectomy, C1 laminectomy and duraplasty. The volunteers' polisomnographıc recordings have been performed in Erzurum Regional Research and Training Hospital, Sleep and Electrophysiology Laboratory. The pre and postoperative recorindgs have been evaluated statistically using Paired sample t test.
RESULTS: The results revealed that, after surgical treatment sleep quantity, sleep efficinecy have been improved significantly.($p<0.05$). The durations of NREM stage 3 and REM periods have been significantly prolonged ($p<0.05$). The durations of NREM stage 2 have been shortened significantly ($p<0.05$).
CONCLUSION: There was no significant appearence between pre and postoperative NREM stage 1 durations.

**PC116**

## Effects of Hyperbaric Air Environment on the P3 Response and Behavioral Performance

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AIM: Nitrogen narcosis is the most important factor limiting the depth and safety of diving. The cognitive changes first appear at 3 atmosphere absolute (3 ATA) of pressure. The earliest and most affected frontal lobe executive functions are learning, decision making, attention and concentration, and impaired neuromuscular coordination. The P3 wave is a well-known event-related potential (ERP) that is sensitive to cognitive processes and performance deficits in brain research. The aim of this study is to investigate the possible effects of a hyperbaric air environment in cognitive functions of amateur divers using ERPs.
METHODS: The all-male participants consisted of 12 healthy volunteer amateur divers (age range, 28±5 years). EEG was recorded from the participants while they performed auditory oddball task in hyperbaric chamber during preDive (1 ATA–sea level), deepDive (5 ATA–40 msw) and postDive (1 ATA-sea level) periods. Behavioral performance and P3 measures are compared between hyperbaric air conditions within participants. EEG signal was collected from 9 channels (F3, Fz, F4, C3, Cz, C4, P3, Pz, P4) according to the extended international 10/20 placement system. The differences in P3 amplitude and latency of ERP peaks were statistically analyzed using repeated measures ANOVA.
RESULTS: In deepDive and postDive conditions behavioral performance was significantly impaired (longer reaction times and more inaccurate responses) compared with preDive period. Correspondingly, P3 amplitudes were significantly attenuated (14.0±4.33; 9.7±4.56; 10.8±3.58, $p<0.003$, respectively) and peak latencies were prolonged (310.5±29.9; 339.9±34.7; 334.1±27.8, $p<0.007$, respectively) in deepDive and post Dive compared with preDive periods. However, there was no significant difference between in any measures from the deepDive and the subsequent post Dive periods.
CONCLUSION: Our preliminary findings provide brain electrophysiology data that indicates the transient mild cognitive decline induced by the hyperbaric air environment exposure that is comparable to recreational diving conditions.