Comparative Study > Indian J Med Res. 2010 Sep;132:278-86.

Proton Magnetic Resonance Spectroscopy of Brain in Obstructive Sleep Apnoea in North Indian Asian Subjects

Surendra K Sharma [1], S Sinha, K A Danishad, U Sharma, H Sharma, H K Mishra, H Mishra, T Kadhiravan, V V Reddy, V Sreenivas, N R Jagannathan

Affiliations + expand

PMID: 20847374

Free article

Abstract

Background & objectives: Repeated apnoeic/hypoapnoeic episodes during sleep may produce cerebral damage in patients with obstructive sleep apnoea (OSA). The aim of this study was to determine the absolute concentration of cerebral metabolites in apnoeic and non-apnoeic subjects from different regions of the brain to monitor the regional variation of cerebral metabolites.

Methods: Absolute concentration of cerebral metabolites was determined by using early morning proton magnetic resonance spectroscopy ((1)H MRS) in 18 apnoeic patients with OSA (apnoeics) having apnoea/hypopnoea index (AHI) >5/h, while 32 were non-apnoeic subjects with AHI< 5/h.

Results: The absolute concentration of tNAA [(N-acetylaspartate (NAA)+N-acetylaspartylglutamate (NAAG)] was observed to be statistically significantly lower (P<0.05) in apnoeics in the left temporal and left frontal gray regions compared to non-apnoeics. The Glx (glutamine, Gln + glutamate, Glu) resonance showed higher concentration (but not statistically significant) in the left temporal and left frontal regions of the brain in apnoeics compared to non-apnoeics. The absolute concentration of myo-inositol (mI) was significantly high (P<0.03) in apnoeics in the occipital region compared to non-apnoeics.

Interpretation & conclusions: Reduction in the absolute concentration of tNAA in apnoeics is suggestive of neuronal damage, probably caused by repeated apnoeic episodes in these patients. NAA showed negative correlation with AHI in the left frontal region, while Cho and mI were positively correlated in the occipital region and Glx showed positive correlation in the left temporal region of the brain. Overall, our results demonstrate that the variation in metabolites concentrations is not uniform across various regions of the brain studied in patients with OSA. Further studies with a large cohort of patients to substantiate these observations are required.