G2.1: Patterns of Cerebral Oxygen during Sleep and Two-Year Functional Decline in Elders, Age 70 years and Older

Author List:
Presenting Author: Barbara Carlson
Additional Author: Virginia Neelon, John Carlson, Marilyn Hartman, Benjamas Suksatit

Presenting Author: Barbara Carlson
Address: 202 Yorktown Drive
Chapel Hill, North Carolina 27516-3239
United States
Ph: 919-966-9416
Fax:
Email: bcarlson@unc.edu
Institution: University of North Carolina - Chapel Hill

Additional Author: Virginia Neelon
Address: CB# 7460, Carrington Hall
Chapel Hill, North Carolina 27599
United States
Ph: 919-966-1410
Fax:
Email: vneelon@email.unc.edu
Institution: University of North Carolina - Chapel Hill

Additional Author: John Carlson
Address: CB# 7460, Carrington Hall
Chapel Hill, North Carolina 27599
United States
Ph: 919-966-7652
Fax:
Email: carlsonj@email.unc.edu
Institution: University of North Carolina - Chapel Hill

Additional Author: Marilyn Hartman
Address: Department of Psychology
Chapel Hill, North Carolina 27599
United States
Ph: 919-966-7598
Fax:
Email: mhartman@email.unc.edu
Institution: University of North Carolina - Chapel Hill
Abstract:
Introduction: Declines in cerebral oxygen levels during sleep are thought to be common in older adults and may pose a risk for functional decline. This descriptive exploratory study describes patterns of cerebral oxygen during sleep and their relationship to functional decline in 107 community dwelling elders, age 70 years and older.

Method(s): Data were collected on 107 community dwelling older adults, at baseline (0 months) and at 12- and 24 months. At baseline, the subjects underwent 2 nights of standard polysomnography including cerebral oximetry (measuring percent cerebral oxyhemoglobin saturation-rcSO2). We used the subjects’ presleep measures of rcSO2 (awake with eyes closed) and the change in rcSO2 during the first sleep cycle to classify subjects into 3 patterns of cerebral oxygen during sleep. Functional status was measured at all 3 timepoints. A decline in function was defined as a decrease ≥ 2 points on the Older Adults Resource Services (OARS) ADL Scale over the 24 months [baseline-(12M + 24M)/2]. Differences in functional decline between patterns of cerebral oxygen reserves were tested using Chi-Square and Logistic Regression.

Results: Eighteen subjects (Group 1) experienced an increase in rcSO2 during sleep; they also had sleeping rcSO2 levels ≥ 55%. Of those with declines in rcSO2 (n=89), 68 subjects (Group 2) had sleeping rcSO2 levels ≥ 55%, and 21 subjects had sleeping rcSO2 levels < 55% (Group 3). Twenty subjects exhibited functional decline, primarily in tasks such as shopping, arranging transportation, and continence. The prevalence of functional decline was greatest in subjects in Group 3 ($X^2_{[df=1]} = 7.3$, p<.01). Logistic regression models showed that the effect of Group 3 membership on functional decline was independent of the effects of age or illness burden ($X^2_{[df=3]} = 26.50$, p<.0001).

Discussion & Conclusions: These findings suggest that lower rcSO2 during sleep is a significant predictor of 2-year functional decline in older adults. Future studies, addressing the mechanisms that contribute to declines in cerebral oxygen levels during sleep, may point to new interventions for lessening functional decline in elders. Support: NR08032, R00046
Abstract History:
This abstract has been presented or accepted for presentation in whole or in part at the SNRS or other scientific meeting.
Gerontological Society of America--Nov 2009. The analysis has been expanded to include a logistic regression analysis that shows the individual contribution of brain oxygen during sleep on function.

Financial Disclosure:
No, I (or a member of my immediate family) have not received something of value* from or own stock (or stock options) in a commercial company or institution related directly or indirectly to the subject of my presentation.

FDA Disclosure:
The FDA has cleared all pharmaceuticals and/or medical devices for the use described in this presentation.

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Submitted by:
bcarlson@unc.edu