disruptor; 2) the occurrence of any ambient disruptor; 3-5) the occurrence of light, temperature and noise as disruptive factors. P values of < 0.000001 are reported.
Results: Overall, females were more likely to attribute at least one sleep disruptive factor to regular awakenings (β: 0.85). This likelihood was also higher in older age (β: 0.03). In contrast with the occurrence of any sleep disruptor, the likelihood of reporting ambient sleep disruptive factors (light, temperature, and noise) declined with age (β: -0.02) yet remained higher for women (β: 0.50). When running the models for each ambient sleep disruptive factor separately, a similar association was observed for noise (β: sex: 0.46, β: age: -0.02), light (β: sex: 0.43, β: age: -0.02), and temperature. (β: sex: 0.44, β: age: -0.02).
Conclusions: Generally, the elderly complain more often of sleep disturbances, and an increased sensitivity to sleep disruptive factors might contribute to this rise in age-related sleep issues. This data analysis confirmed an increase in reported sleep disturbing factors with age. Interestingly, we observed a reduction in the occurrence of ambient sleep disruptors including light, temperature, and noise. This decline with age may be attributed to the decreased sensitivity of the human senses due to aging coupled with the emergence of other physiological, psychological, social, or health-related factors that may negatively impact sleep and sleep comfort. Based on these results, improvement strategies that focus on optimizing the sleeping environment may be more effective in younger populations. Future work should address the impact of other sleep disruptors beyond ambient sleep disruptive factors and examine objective sleep parameters and sleep disturbances.

SLEEP ARCHITECTURE AND HIPPOCAMPAL SUBFIELDS IN HEALTHY OLDER ADULTS

H. Isotalus [1], A. Wearn [2], J. Selwood [3], U. Bartsch [4], C. Durant [5], M. Jones [5], R. Kauppinen [6], E. Coulthard [3]. [1] *University of Bristol, Department of Electrical & Electronic Engineering, Bristol, United Kingdom;* [2] *McGill, Department of Physiology, Montreal, Canada;* [3] *University of Bristol, Clinical Neurosciences, Bristol, United Kingdom;* [4] *University of Surrey, Biosciences and medicine, Surrey, United Kingdom;* [5] *University of Bristol, School of Physiology, Pharmacology & Neuroscience, Bristol, United Kingdom;* [6] *University of Bristol, Experimental Psychology, Bristol, United Kingdom*

Introduction: Scalp electroencephalogram recordings of spindles and slow-waves during N3 offers an indirect route to studying intracranial events, such as hippocampal-thalamic-cortical interactions, and their roles in memory and cognition. We investigated whether sizes of different hippocampal subfields as measured by MRI, are associated with sleep stage durations or spindle densities in N3.
Materials and Methods: 30 healthy elderly (65-79 years,19 females) underwent T1 and T2 structural MRI scans, with parameters optimised for whole hippocampal imaging and subfield segmentation, and a full night of polysomnography. Hippocampal subfields CA1, CA2, CA3, dentate gyrus (DG) and adjacent temporal lobe regions (subiculum and entorhinal cortex, EC) were segmented using an automated procedure. PSG was staged manually. An automated filtering and thresholding algorithm was used to identify sleep spindle events during N3.
Results:N3 duration in minutes was negatively correlated with CA2 ($r = -0.44$, $p = 0.014$), DG ($r = 0.063$, $p < 0.001$) and EC volumes ($r = -0.42$, $p = 0.020$). No other relationships were found between the subfields (CA1-3, EC and subiculum) and sleep stage durations (N2, N3, REM). We ran a multiple stepwise linear regression model to predict |N3 duration, with body weight and CA2, DG, and EC volumes. The end equation ($F(1, 28) = 6.81$, $p = 0.014$, $R2 = 0.17$) included CA2 volume, but not body weight, EC, or DG. Average slow wave sleep duration reduced by 2.8 minutes with each mm^3 decrease in CA2 volume.
EEG data quality for two participants did not allow spindle detection (n spindle analyses = 28). We found that N3 spindle density (n spindles per minute) was positively correlated with volumes of CA2 ($r = 0.52$, $p = 0.004$) and subiculum ($r = 0.46$, $p = 0.014$). A stepwise linear regression was performed as above but to predict spindle density from subfield volumetrics. The end equation included ($F(1, 26) = 9.8$, $p = 0.004$, $R2 = 0.25$) CA2 volume only. Spindle density increased by 0.17 spindles per minute with each mm3 increased in CA2 volume. Aforementioned findings were significant at α=0.05 level following false discovery rate adjustment. It is possible intercorrelations between subfield volumes affected the end results of the linear regression models.
Conclusions: Larger subiculum and CA2 volumes are associated with increased spindle density, but only larger CA2 volume predicts shorter N3 duration. This may point to distinct roles of CA2 and subiculum in generating sleep spindles. Subiculum is the major output region of the hippocampus and functional hippocampal-cortical connectivity increases in humans during non-REM sleep. The role of CA2 is less clear. In animals, CA2 activity is associated with hippocampal ripples and memory replay during wake and sleep. These findings shed light on potentially dissociable roles of individual subfields in sleep and memory.
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SLEEP ARCHITECTURE DEVELOPMENT IN BLIND AND SIGHTED CHILDREN

H. Vitali [1,2], C. Campus [1], V. De Giorgis [3], S. Signorini [3], F. Morelli [3], C. Varesio [3], M. Gori [1]. [1] *Italian Institute of Technology, U-VIP, Unit for Visually Impaired People, Genova, Italy;* [2] *Università degli Studi di Genova, Department of Informatics, Bioengineering, Robotics and Systems Engineering (DIBRIS), Genova, Italy;* [3] *IRCCS Mondino Foundation, Pavia, Italy*

Introduction: The sleeping brain has been investigated during most of the twentieth century. However, its underlying mechanisms remain mostly unclear, such as plastic changes in the absence of vision. It is still unclear whether visual deprivation affects sleep only through circadian desynchronization or through a reorganization of sleep-related structures and how this possible reorganization evolves with age. The presence of circadian disorders in blind children is rare in clinical practice, differently from adults, but the development of sleep architecture in this population is a poorly investigated issue. Starting to explore the differences between blind and sighted children, we investigated their nap macro-and microstructure.
Materials and Methods: The population comprises 45 blind/severely visually impaired and 58 sighted children aged 6 months to 6 years subdivided into two age-bins [0-3) and [3-6) years. Naps were recorded using 21 electrodes video-EEG and extracerebral polygraphy, including breath, heart rate, and electromyography. All traces were analyzed to evaluate macro-structure, e.g., sleep statistics, spectrograms (focusing on sigma [11-16]Hz and delta [0-4.75]Hz bands), and sleep micro-structure (considering sleep spindles and slow-waves).
Results: About sleep macrostructure, the percentage of N3 on total sleep time (TST) was higher in sighted children considering that the TST is similar in the two groups. REM sleep was higher in young blind than sighted children. However, delta activity showed only a reduction with age in N1 and N2 stages. Sigma activity was stronger in sighted children during NREM2 and increased with age in the N3 sleep stage. About sleep microstructure, fast spindles were denser in young sighted than in blind peers, and only in the sighted children decreased with age. Fast spindles were denser than slow spindles. In all age-bins for the sighted children, while only in the old age-bin for the blind group. Group, frequency band, and age-bin differences were also found in spindle duration and amplitude. N2 slow-waves, related to K-complexes, showed a main effect of group and age-bin in amplitude and morphologic features (downslope and upslope) but not in density. N3 slow waves showed an age-bin main effect in amplitude and a group main effect in morphology.
Conclusions: These results show notable differences in the development of sleep architecture between blind and sighted children, probably related to sleep stability and cognitive skills and involving different maturation and synaptic pruning processes.
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