

## **The Nocturnal Sleep Disturbances and Sleep Assessment Difficulties among Agitated Late-Stage Dementia Patients**

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### **Introduction**

Sleep disturbance and disrupted circadian disruption are common in late-stage agitated dementia patients, and behavioural and psychological symptoms of dementia (BPSD) happening at night are particularly challenging to the caregivers and dangerous to the patients themselves. Measuring these symptoms currently relies on carer-rated questionnaires, which can be imprecise. Here we explore the use of a validated research-grade actigraphy and an open-sourced algorithm to objectively and longitudinally measure the nocturnal sleep symptoms of late-stage dementia patients within the Sativex® for the treatment of Agitation & Aggression in Alzheimer's Dementia trial.

### **Materials and Methods**

We recruited 29 (14 female) care home residents living in Greater London area with late-stage Alzheimer's disease and significant agitation/aggression to wear the Geneactiv Original actigraphy watch for 4 weeks. The participants' comprehensive BPSD were assessed with the Neuropsychiatry Inventory-Nursing Home version and with the Pittsburgh Sleep Quality Index (PSQI) at the baseline, week 2 and week 4.

Open-sourced R-package GGIR was used to analyse their activity and sleep pattern. Sleep-related signals were explored and correlated with the NPI-sleep item score and the PSQI items of the corresponding assessment period. Spearman correlation and linear regression to analyse questionnaire-based and device-based results were undertaken using R packages in the R studio. A two tailed alpha of 0.05 was used and p values <.05 were considered statistically significant.

## **Results and Conclusions**

The prevalence of significant sleep problem was high in this population, regardless of the measuring tool being used (62.1% NPI-sleep item  $\geq 4$ , 72.4% PSQI  $> 5$ , and 51.9% actigraphy-derived sleep efficiency  $< 85\%$ ). Proxy-rated questionnaires and actigraphy results averaged across multiple days had good correlations in qualitative variables, but wearable device may be more sensitive in measuring time-dependent variables and reflecting the sleep regularity. The two measurements had a larger disagreement in residents with atypical sleep time and/or timing, suggesting clinical trials aiming at improving sleep disturbances in such population should consider applying wearable devices for more precise measurement.

中文題目：晚期、躁動之失智症患者的睡眠問題與睡眠評估困境  
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