SLEEP IN THE EARLY PRETERM BABIES: COMPARISON OF POLYSOMNOGRAPHY WITH AN EEG-BASED INDEX

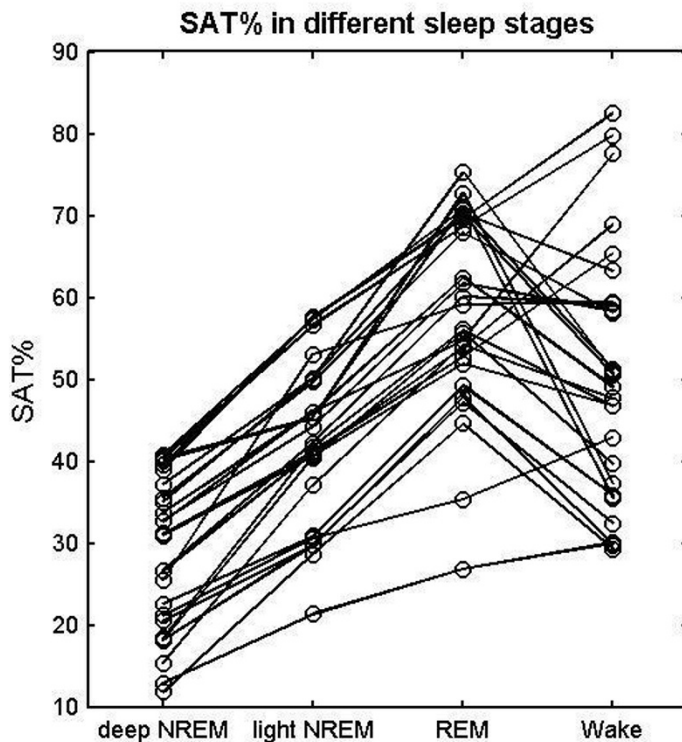**K. Palmu**[1,2], T. Kirjavainen[3], T. Salokivi[4], S. Vanhatalo[1]

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Background and aims: Presence of sleep wake cycling (SWC) is thought to indicate stability in the neonates. While assessment of SWC is commonly performed subjectively from aEEG brain monitoring in fullterm babies, it is highly ambigious in early premies with less clear SWC. We studied whether the automated detection of spontaneous activity transients (SATs, also called bursts) could be utilized in developing an objective SWC detection in preterm babies.

Methods: 15 polysomnographic recordings from 12 preterm infants (CA 25.9-32.7 weeks) were used. Sleep stages were scored in 20s epochs by applying international infant scoring standards. EEG signals (C3-A2, O2-A1) were processed in 20s epochs to obtain SAT%, an index describing the amount of SATs per time. An artefact rejection method was developed to make the approach compatible with the often noisy, real life recordings.

Results: In all recordings, we observed a clear, consistent relation between SAT% and the sleep stages (Figure). SAT% was smallest in the deep NREM sleep, intermediate for light NREM sleep and highest for REM sleep. Epochs scored as Wake did not show consistent relations to the SAT%.

Conclusions: Automated detection of SATs shows a consistent relation to sleep stages in the early preterm infants. Thus, SAT% may be used for an objective method for continuous assessment of SWC in the widely available (a)EEG monitors.

[Figure]