

Weckuntersuchungen in zwei aufeinanderfolgenden Nächten – Schlafwahrnehmung und Reaktionsvermögen

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INTRODUCTION Sleep, as a physiological state, is sometimes perceived by the subjects as wakefulness, when subjects are deliberately awakened and interviewed. The extent of this misperception is dependent on the actual sleep state with more wake estimates after S2 than REM sleep awakenings [1, 2]. A continuity hypothesis has been suggested and physiological sleep was assumed to be perceived as wakefulness if the mental processes during sleep are congruent with those of the wake state. The present study should clarify, whether the proportion of wake ratings after awakenings from S2 or REM sleep (REMS) differs between the first and second night in the sleep laboratory. Additionally, reaction time was measured to see whether the speed to react correlates with state perception. Such a relationship has been suggested earlier [2].

METHODS Twelve clinically healthy subjects (3m, 9f; mean age 23.4 years) were awakened twice on two consecutive nights, either after 15 minutes of continuous S2 or 7.5 minutes of uninterrupted REMS. The order of awakenings was balanced across the two nights with a total of 12 awakenings per state (S2 or REMS) and night (1st vs. 2nd). The awakening signal was a loud tone, which had to be interrupted by the subjects as quickly as possible by pressing a micro-switch, which was fixed to the thumb of the dominant hand. Immediately after the reaction time measurement subjects were asked about the state, mental activity, and aspects of their perception of the actual situation. The questions were identical to those of an earlier study [1]. We expected (i) more wake judgements after S2 than after REMS, (ii) more wake judgements in the 1st than in the 2nd night, and (iii) a shorter mean reaction time before wake judgements, as suggested by Sewitch [2].

RESULTS There was a total of 48 awakenings. In nine cases (18.8%) the prior state was judged as awake. The proportion of awake judgements was higher for S2 (29.2%) than for REMS (8.3%), while the two nights did not differ significantly. S2 was perceived as awake in 25.0% of awakenings in night 1 and in 33.3% in night 2. REMS was always perceived as sleep in night 1, and twice as awake (16.6%) in night 2. While the mean reaction time (\pm SD) was slightly but consistently longer for S2 (2.0 ± 0.8 sec.) than for REMS (1.5 ± 0.4 sec.; $p < .05$, McNemar $\div 2$ test), there was no significant difference within state between correct and incorrect state judgements. Reports of ongoing mental activity were high for S2 (83.3%) and REMS (100%) awakenings. This activity was more image-like in REMS (83.3%) than in S2 (40.0%; $p < .05$) as well as being clearer (90.0% vs. 40.0%, respectively; $p < .05$). Finally, subjects rated prior sleep more frequently as deep sleep when awakened from REMS (58.3%) than S2 (16.7%; $p < .05$).

DISCUSSION The present results are in agreement with earlier ones in so far that about 20% of subjects who slept according to electrophysiological criteria rated this state as wakefulness, and the discrepancy between measured and perceived sleep was greater for S2 than for REMS. The other two hypotheses could not be confirmed. (1.) In contrast to our expectation there was no difference in the quality of the judgement between the two nights. (2.) Mean reaction time was unrelated to state rating in S2 in the present study.

This result is at variance with an earlier finding [2], possibly because the Response criterion (verbal response vs. push button) differed between both studies.

REFERENCES

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