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Editorial

REM on demand: an editorial on 'Elicitation of sleep-onset REM periods in normal individuals using the sleep interruption technique (SIT)'

This article outlines a technique for the experimental elicitation of REM sleep episodes with minimal amounts of prior NREM sleep. The authors lay the ground work for their review of this work by reminding the readers of the diverse pathologies which share a common sleep abnormality: the appearance of an episode of REM sleep very shortly after sleep—most notably observed in patients with narcolepsy, major depression and schizophrenia. In fact, the association between sleep onset REM periods (SOREMPs) on the Multiple Sleep Latency Test and other symptoms of narcolepsy is so strong as to constitute a criterion to be used to confirm this diagnosis [1]. In major depression a reduced latency to the first REM period of the night (less than 65 min) has been called a 'biological marker' of depression [2].

The fact that healthy subjects, screened to rule out those with symptoms of narcolepsy or of any current or past history of major depression, may also exhibit SOREMPs has led to an understanding of the common conditions contributing to this phenomenon. Some of these, such as sleep/wake cycle disruption, are circadian in nature; others, such as extended periods of sleep fragmentation or of sleep deprivation, relate to circumstances that disturb the usual ultradian rhythm. SOREMPs in normals may be found acutely, following changes in sleep schedules due to travel, work hours, or periods of psychological stress, or they may be chronic due to some biological, possibly genetic, dysfunction of the mechanism regulating the cycling of REM sleep. An example of the chronic appearance of 'early REM' in healthy subjects is found in the sleep studies of some non-depressed relatives of depressed patients as demonstrated in Giles' longitudinal studies [3]. These studies are particularly compelling given the suggested predictive power of these early-onset-REM sleep findings for the later development of an episode of major depression.

Given this rationale for interest in a naturally occurring sleep abnormality, the authors offer a methodology for its experimental exploration and the promise of some possible clinical applications for the control of REM sleep timing based on this work, but they have, in the present paper, only scratched the surface of the methodology's potential. In fact, the protocol they suggest for inducing SOREMPs is, at this point, rather loosely structured. The experimenter who would use this technique is given rather wide ranges of duration of NREM sleep allowable before initiating the sleep interruption (SI), time of night suggested for the SI, amount of awake time to be enforced, and task to be used to fill that interval. The recommendations, based on a review of the experimentally induced SOREMPs in normal subjects using the SI manipulation, are largely limited to the authors' work and do not cover the extensive epidemiological literature linking chronically disrupted sleep (insomnia) to the development of clinical depression [4] which may well be accompanied by an early REM or SOREM. Nor do the writers integrate the literature on manipulations of REM sleep in neonatal animals which produces a model of adult depression [5]. They do not note previous work on the effects on normal subjects' subsequent sleep of various tasks performed during experimental sleep interruptions [6].

Other issues relevant to this paper include: do SOREMPs differ physiologically—in eye movement density, length of REM, presence of muscle atonia, and effects on subsequent sleep—from REM periods occurring at the usually expected times? Are they psychologically similar in their effects on waking mood, or recall of new learning? Do they differ in dream intensity and likelihood of content to demonstrate incorporation of some aspects of the previous waking task? If naturally occurring SOREMPs represent a dysfunctional occurrence, do they inform us further about the usual function of REM sleep?

Perhaps the SI technique can be used to disentangle the methodological problems involved in relating dream content reports to prior waking experience: the unknown effect on the dream report of mentation taking place during the NREM sleep prior to the REM awakening and the possible confounding influence of the subject's memory of any previous report given following a prior awakening. The use of the SI method, coupled with the control of the waking experience during the SI interval, should be of help in resolving some of the issues complicating the question of whether dreams represent a continuation of processing recent waking stimuli. If, when the above-mentioned confounds are controlled, reports from these SOREMPs include images relating clearly to the interpolated waking task, the question of whether dreams have meaning and how they relate to reality may be further resolved.

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The SI technique may also be used to address the thorny problem of how to precipitate a parasomnia episode in the laboratory. Diagnoses of sleep walking, night terrors, episodes of sleep-related violence, or sexual behaviors have been difficult to establish from a single night of polysomnography. Some of the same conditions that produce SOREMPs in the healthy, such as sleep deprivation, and psychological stress, are also implicated as contributing factors in episodes of adult parasomnia in those genetically vulnerable to this disorder. This vulnerability may be some heritable weakness in the 'REM on' system leading to a delayed REM onset. Under sleep deprivation and/or stress conditions the parasomnia patient aborts the expected REM episode after an NREM interval by an arousal into a dissociated behavioral state. Perhaps the SI technique could force a more reliable REM attempt in the laboratory where the abnormal arousal could then be investigated under controlled conditions.

This paper stirs up issues that have been of concern in our field for many decades. Progress has had to wait for newer approaches that offer better controls. The SI technique promises to be one such method for addressing some of these old problems in a new way.

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