

Significance of Slow Wave Sleep: Considerations from a Clinical Viewpoint

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Summary: Previous experimental observations, almost exclusively carried out with young healthy subjects, have been interpreted as showing a particular restorative role for human slow wave sleep (SWS). This article considers whether findings from polygraphic sleep studies in patients and elderly subjects lead to similar inferences about the meaning or "function" of SWS. The question was approached in three different ways: (a) by presenting results from a long-term study in elderly subjects whose SWS data were correlated with baseline medical and psychometric findings and with 5-year follow-up results; (b) by correlating nonmanipulated wake-time during days with parameters of SWS on subsequent nights in a group of 30 demented inpatients undergoing 72-h continuous sleep-wake recording; (c) by reviewing and comparing published polygraphic sleep studies for a number of psychiatric conditions. None of these three approaches provided unequivocal evidence for a clinically significant role for SWS. Reasons for the different outcome of SWS studies in young experimental subjects and clinical populations are discussed. **Key Words:** Slow wave sleep—Sleep stages—Sleep and old age—Dementia.

The significance or meaning of polygraphically defined sleep stages in humans has been discussed ever since their description in terms of electroencephalographic patterns (1) and following the discovery of REM sleep (2). Whereas REM sleep was related to dreaming and connections to psychological and psychopathological parameters were soon established, interest in slow wave sleep (SWS) emerged somewhat later. Experiments in young volunteers (3) supported earlier observations (4) that SWS denoted particularly "deep" sleep, as measured by the stimulus intensity needed to awaken a sleeping subject. Other findings, such as the occurrence of SWS in the first few hours of sleep and its increase as a function of previous time awake, e.g., after sleep deprivation, led to the assumption that SWS serves for physical restoration or, put more cautiously, that SWS marks a time in which restorative processes of the organism are taking place.

The discovery that the anabolic growth hormone is excreted mainly during SWS (5) supported the restoration hypothesis of SWS. This was further expanded by Oswald (6) and Adam (7), who adduced biological data to show that the purpose of sleep, and particularly SWS, was for tissue repair and growth. On the other hand, not all studies involving

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Slow Wave Sleep Its Measurement And Functional Significance

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