

central nervous system and a peripheral metabolic disorder, respectively, it is now widely recognized that AD and T2DM share several common abnormalities including impaired glucose metabolism, increased oxidative stress, insulin resistance and amyloidogenesis. The major constituent of the amyloid deposits is a peptide amyloid  $\beta$  ( $A\beta$ ) derived from the proteolysis of a large membrane-spanning precursor protein, the amyloid precursor protein (APP).

**Objectives:** Since presenilin-1 (PS1) is a subunit that cleaves APP at multiple sites within the transmembrane domain, generating  $A\beta$  peptides, in this study, we aimed to investigate whether sleep deprivation affects PS1 expression.

**Methods:** We have analyzed the effect of 72 hours of sleep deprivation with the platform technique on PS1 expression using real-time PCR analysis in hippocampi of adult male mice (sleep-deprived,  $n=8$ ; controls,  $n=6$ ).

**Results:** Our results demonstrate that PS1 expression increased 50% in deprived sleep mice as compared to controls ( $p=0,048$ ).

**Conclusion:** Sleep deprivation alters the expression pattern of  $\gamma$ -secretase PS1, which cleaves APP. Despite the multifactorial nature of T2DM and AD, we can infer that sleep disorders associated with both syndromes may affect the amyloid deposits. This could be a point of connection that contributes to overlapping pathologies and to the progression of these diseases.

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### 053 CLINICAL AND POLYSOMNOGRAPH EVALUATION OF SLEEP DISORDERS IN SCA2 PATIENTS: A PHENOTYPICAL AND MOLECULAR CORRELATION

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Sleep disorders are common complaints of spinocerebellar ataxia type 2 (SCA2) patients and their relatives.

**Objective:** The aim of this study was to characterize the sleep pathology in SCA2 and to evaluate its association with the clinical and molecular features of the disease.

**Methods:** An electrophysiological characterization of sleep disorders in a large population of SCA2 patients, presymptomatic relatives and healthy controls was performed using a standardized sleep questionnaire and two all-night video-polysomnography (VPSG) recordings. PCR was used to determine the number of CAG repeats.

**Results:** SCA2 patients and presymptomatic individuals show a significant reduction in sleep efficiency, an increase in the number of wake periods after sleep onset and an increased arousal index. REM sleep was abnormal in approximately 60% of the SCA2 patients and the presymptomatic individuals. The pathology of REM sleep was characterized by a reduction in the mean duration of REM episodes, the loss of muscle tone and a decrease in REM density. In patients, the percentage of REM sleep was negatively correlated with the scale for the assessment and rating of ataxia (SARA) score but not with the size of the polyglutamine expansion. The number of CAG repeats, however, influenced the arousal index during REM sleep. REM density shows a negative correlation with SARA score. Periodic legs movements (PLMs) were observed in approximately 42% of SCA2 patients. This alteration was significantly accentuated in patients with larger SARA scores and longer disease durations. The PLM index was not influenced by CAG repeats. SCA2 patients showed a significant increase in the central, but not obstructive, sleep apnea-hypopnea index. The mean Epworth scores of the patients and presymptomatic individuals were not significantly different from healthy controls, which were supported by the results of multiple sleep latency tests (MSLT).

**Conclusions:** The early and progressive REM sleep reduction in SCA2 patients has been associated with the degeneration of the pons, nigrostriatus and thalamus and is considered to be a novel marker for the progression of the disease. The decrease of REMs density is in agreement with the sacadic pathology in SCA2. REM sleep without atonia may be interpreted as subclinical REM sleep behavior disorder (RBD) and suggest neurodegenerative lesions in subcortical regions. PLMs may be related to a dysfunction of the dopaminergic pathways, which could be complemented by deficits of serum iron concentration in some patients. Central apneas may reflect dysfunctions, which are related to neurodegenerative processes within the respiratory center in the brainstem.

## Heath Care Delivery and Utilization

### 054 A BIBLIOMETRIC ANALYSIS OF SLEEP RESEARCH INDEXED IN PUBMED, 2003-2007

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**Introduction:** Sleep Medicine has grown into a multi-disciplinary field due to the rapid progression in knowledge, which resulted in an increase in scientific literature publications on this topic.

**Objective:** To review the current status of publication activity on the subject of sleep and sleep disorders for the period 2003–2007 in the top 20 journal publications of chosen specialties based on the journals' five-year impact factor. Specifically, to determine which journals publish the most articles and the ratio of sleep articles in each publication, the types of references being published, and which subjects are most written about.

**Methods:** The top 20 journal titles of chosen specialties were determined based on the five-year impact factor from the Journal Citation Reports. A MEDLINE search for articles published from 2003 to 2007 was done using medical subject heading (MeSH) terms. EndNote and Excel were used to sort and compare the articles. FileMakerPro was used match the articles to the set of journals.

**Results:** A total of 14244 references were found in the PubMed database, 4559 of which were published in 193 journals ranked on the top 20 journal publications of chosen specialties. There was an increase in publication activity over the past 5 years with an annual growth rate of 8%. The majority of the articles were in English and only 1009 (7.1%) were in other languages with English abstracts. The greatest contribution came from the USA (31%). Besides the core journals Sleep and Sleep Medicine Review, sleep articles comprise 1.5 to 25% of the total articles in the top 50 publications with the highest number of sleep articles. In the journals with five-year impact factors of 10 or higher, sleep articles comprised only 0.3 to 2.7% of their publications. There has been an increase in the number of articles in foreign languages and multi-center studies, 11.26% and 14% yearly, respectively. Meta-analysis articles also grew: 30% annually. Randomized controlled trials grew 7.81% per year. Of the studies that indicated the source of support, the majority was from the non-government sector. Among the chosen major topics, sleep apnea, obstructive and sleep apnea syndromes were the most written about. REM sleep behavior disorder articles showed the greatest increase in the number of articles.

**Conclusion:** In spite of the increasing number of articles on sleep, they still comprise a small proportion of the publications in major journals outside of the core clinical journals.

### 055 A-TEST APPLIANCES: A GROUP OF NOCTURNAL INTRAORAL DEVICES FOR THERAPY OF BREATHING DISORDERS

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Sleep apnea obstructive syndrome is a chronic disease with a high rate of mortality and morbidity. The symptomatic trail encompasses snoring, which is present in most cases, excessive daytime somnolence with progressive behavioral, cardiovascular and neurological effects. As the syndrome occurs with the blockage of the upper airways during sleep, appliances that enhance nocturnal mandibular advancement can offer significant improvement, with controllable adverse effects. Thus, A-TEST appliances serve as an alternative treatment to those currently offered in Sleep Medicine, as long as it is provided with consistent treatment, specialized implementation and efficient clinical tests on results. Voluntary adherence to intraoral appliances for mandibular advancement during snoring and episodes of sleep apnea obstructive syndrome is closely related to resolution effectiveness rates, comfort offered with the appliance and costs for build-up, installation and maintenance. The present work is justified and also consists of a preliminary invention patent proposal, which is based upon: a) the availability of all necessary technical resources to minimize adverse effects that might lead to misuse; and, b) the need of idealizing test prototypes to predict effectiveness in less favorable cases. Thus, the detailed description of the current product relies on contemporary scientific and technical criteria, which

in turn are based upon the most recent knowledge found in revised literature.

#### 056 CPAP TREATMENT UNDER THE JAPANESE MEDICAL CARE SYSTEM

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**Purpose:** Since Japan is one of the few countries where the whole population is covered by mandatory health insurance, all CPAP machines and expendable supplies are covered at the same price on a monthly basis with the condition that CPAP users also make a clinic-visit once per month. The aim of this study was to determine the level of compliance of our patients with obstructive sleep apnea syndrome (OSAS) with this system and to discover the reasons for non-compliance as well as the demographics of the non-compliant individuals. The OSAS patient cohort in this study included 268 patients (244 males and 24 females, mean age 54.1±13.4 years) who were supposed to attend monthly CPAP check-ups with a physician consultation over the 5-month period from May 1 to September 30, 2008.

**Methods:** The progress notes of the subjects were examined to identify those patients who attended the CPAP clinic less than five times and to investigate the reasons for their non-adherence to the program.

**Results:** A total of 32 patients (11.3%, 30 males and 2 females, mean age 50.1±11.2 years) did not attend the clinic for all five of the required visits. The provided reasons were classified into five groups: A) patients whose first visit to the general neurological clinic involved a reason other than sleepiness or insomnia (14 patients), B) patients who failed to come only for one particular occasion (5 patients), C) patients whose prior visits had been very regular and then suddenly stopped coming to the clinic (4 patients), D) patients who had not been well-informed with respect to the CPAP treatment program set-up by the insurance system (3 patients), and E) other reasons (6 patients).

**Conclusion:** Most of our patients were adherent to the mandatory monthly CPAP follow-up. Asymptomatic patients who did not realize the direct benefit of CPAP were less adherent. Therefore it was indicated that patient selection may be an important factor for continuing treatment. A further comparison between the characteristics of the adherent and non-adherent patients is warranted.

## Insomnia

#### 057 PSYCHOSOCIAL FEATURES OF BRAZILIAN PATIENTS WITH SLEEP STATE MISPERCEPTION

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**Introduction:** Sleep State Misperception (SSM) is the current diagnostic term for the intriguing group of insomnia patients who appear unable to discriminate sleep from wakefulness. Historically, it has been among the most challenging sleep disorders to understand and clinically manage. According to the International Classification of Sleep Disorders (ICSD), SSM, which was recently renamed "Paradoxical Insomnia", is a disorder in which a complaint of severe insomnia occurs without any objective evidence of sleep disturbance and without a significant impairment of daytime function. The present study aims to identify the psychosocial features of patients with SSM.

**Methods:** The study population included SSM patients from the Neuro-Sono Sleep Center, Department of Neurology, Universidade Federal de São Paulo, Brazil. Semi-structured interviews were conducted following a script of questions with regard to birthplace, family, childhood, sleep, moves, present life and perceptions. A content analysis of the interviews was performed, with a specific focus on the interviewees' feelings, thoughts, and social and familiar insertion.

**Results:** A total of 60 patients, with 33 females and an age range of 23 to 76 years old, with a confirmed diagnosis of SSM were identified from among 2000 medical files and 1735 PSG studies. Eighty percent of the SSM patients

were not natives of Sao Paulo City. In all patients, the severity of the nocturnal complaint was not confirmed by evidence of pathologic sleepiness, marked performance decrements, or other severe functional impairments during the day that are typically seen in cases of such marked sleep deprivation. Sleep stages 1 and 2 were longer in the SSM patients than among people without any sleep complaints. One patient had an autoimmune disease, and two had syndromes affecting perception. The data collected from 20 interviews revealed several shared features in these patients: unsafe and threatening environments; uprooted feelings; complacent and methodical behavior; proactiveness, resilience, and rootlessness; and recurrent feelings of loss and grief. These patients related concerns about the long-term effects of their perceived sleep deficits on their general health and longevity.

**Conclusion:** The psychosocial features of SSM patients are important components for their diagnosis and treatment. The observations in this study could potentially help to determine a psychological and clinical profile of SSM patients. In addition, the psychosocial features found in this study are likely not restricted to Brazilian culture, but are probably found in SSM patients from other cultures, which will necessitate equivalent studies in different cultures.

#### 058 REDUCTION OF SLEEP COMPLAINTS BY A SELF-HELP BOOK FOR INSOMNIA – A WEB-BASED STUDY

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**Introduction:** The treatment of choice for chronic insomnia is cognitive behavioral therapy. Few patients receive such treatment today, and there is a need to increase the availability of such treatment.

**Objectives:** In this study, we wanted to investigate the effect of a self-help book for treatment of insomnia.

**Methods:** Subjects were recruited through a flyer inside the self-help book "Bedre søvn. En håndbok for deg som sover dårlig", written by Bjørn Bjorvatn. The book focuses on cognitive behavioral therapy for insomnia. Participants were asked to enter a webpage and complete sleep questionnaires (Pittsburgh Sleep Quality Index [PSQI] and Bergen Insomnia Scale [BIS]) before reading the book, and once again after three months. Fifty-two subjects (participation rate 66%) completed the questionnaires both before reading the book and three months after. Mean age was 48.6 years and 63.5% were women.

**Results:** PSQI global score was reduced from 13.6 to 9.7, BIS total score was reduced from 27.6 to 20.1, and sleep efficiency increased from 58% to 72% from before to after reading the self-help book (all  $p < 0.001$ ).

**Conclusion:** The self-help book appears to be an efficient low-threshold intervention, easily accessible to many patients suffering from insomnia. The lack of a control group is a limitation to the study.

#### 059 PECULIARITIES AND PREVALENCE OF SLEEP DISTURBANCES IN MEN WITH HIGH LEVEL OF PROFESSIONAL STRESS AND NIGHT-SHIFT WORK

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**Background:** The purpose of the present work was to estimate the peculiarities and prevalence of sleep disturbances in men with high level of professional stress and night-shift work. Patients and methods: We examined 39 healthy men, age 20–43 years, who are part of the special emergency federal fire brigade and whose periods of work ranged from 1 to 22 years. Their work is connected with a high level of professional stress and night-shift work. The group was divided into two subgroups, those with a period of work less than or equal to 5 years ( $n=20$ , mean age 23±1.9) and those with more than 5 years ( $n=19$ , mean age 35±5.35). The examination included a questionnaire for subjective sleep characteristics assessment, the obstructive sleep apnea questionnaire, the Epworth Sleepiness scale, the Hospital Anxiety and Depression scale and polysomnographic recording of night sleep.

**Results:** Comparative analysis of the groups revealed absence of any signs of obstructive sleep apnea, anxiety, depression, or decrease in total sleep time in both groups. Light subjective disturbances of sleep were present in 20% and 42%, signs of sleepiness in 15% and 37%, sleep efficiency (93.07±4.88, 87.58±9.29,  $p < 0.05$ ), respectively. The most frequently seen pathological changes in the hypnogram were a decrease of delta sleep percentage below 20% (50% and 58%), decrease of fast sleep percentage below 25% (75% and