

that lasted more than 100 ms and by the amplitude of any facial muscle that exceeded by 500% the background EMG activity. Additionally, experimental awakenings were performed during NREM and REM sleep stages without FMC. Following sleep recordings, FMC and REMs were quantified and analyzed for possible correlations between them. EDM global scores were gauged by exploring their correlation coefficients.

Results: Periods with FMC and REMs were associated to higher levels of EDM in healthy subjects as compared to periods without FMC. Moreover, EDM modality (e.g. happy vs. anxious) was linked to certain muscle activation (e.g. higher FMC of zygomatic vs. lower corrugator).

Conclusion: The present study shows that during REM sleep with FMC (vs. periods without FMC) the corrugator, zygomatic muscles and REMs are associated to EDM. Additionally, FMC were differentially associated to emotional modality according to the activated facial muscle. Altogether, these findings are consistent with theoretical perspectives of higher emotional variations during REM sleep associated to dream content. Implications are discussed.

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Sleep deprivation induce morphology changes in the hippocampus and prefrontal cortex in young and old rats

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Introduction: During normal aging several changes in sleep/wake patterns are observed, which include frequent awakenings during sleep and increased daytime naps, among others. Likewise, aging has also been associated with a deterioration of cognitive function, learning and memory, although widespread loss of nerve cells does not occur, the most of age-related structural changes observed in nerve cells are modifications in dendrites, dendritic spines or even axons. Evidence accumulated over the last years indicates that these functional changes observed during sleep loss, aging, or both could be due to modifications in synaptic connectivity and intracellular signaling; for example, excitatory synaptic transmission at the hippocampal CA1 region is affected by sleep deprivation; in the locus coeruleus (involved in both arousal system and cognitive performance) the number of neurons projecting to areas such as the cortex and the hippocampus declines with age. Therefore, it has been hypothesized that sleep deprivation may compromise neurophysiological and behavioral events; however, relatively few studies have investigated links between sleep loss and structural changes in neurons and, despite the seemingly similar effects of age and sleep deprivation on cognition and the prevalence of sleep changes with age, little is known about the impact of sleep loss on cellular morphology in aging neurons. For that reasons, the aim of this study was to evaluate the effects of total sleep deprivation on neuronal morphology in the hippocampus and prefrontal cortex of both young and aged animals.

Materials and methods: A total of 28 male Wistar rats (14 “young-adult” rats, 3–4 months old; 14 “aged rats”, 22–23 months old; 7 for control and 7 for sleep deprivation for each age) were used in this study. Total sleep deprivation was carried out in both experimental groups (young-adult and aged, $n = 7$ per group) by gentle handling: once sleep-behaviour was observed or low amplitude waves first

appear in sleep recording, rats were softly touched in their tails, whiskers or handling them to prevent falling asleep during 24 h. Immediately after sleep deprivation finished, animals were deeply anesthetized with sodium pentobarbital (75 mg/kg, i.p.) and then perfused intracardially with 0.9% saline solution. Brains were removed and stained by modified Golgi-Cox method. Pyramidal neurons from layer 3 of prefrontal cortex and hippocampus (CA1 area) were selected for study. Five neurons from each region of each brain hemisphere per animal were drawn using a camera lucida. Basal dendrites, including all branches, were reconstructed for each neuron and their dendritic tracings were quantified by Sholl analysis.

Results: Results showed that total dendritic length of prefrontal cortex and hippocampus was not affected either age or after 24 h of sleep deprivation compared to their corresponding control group. However, after 24 h of sleep deprivation (SD) aged animals had an increase in spine density in prefrontal cortex but not in hippocampus.

Conclusion: Sleep deprivation could be considered a factor that induces neuronal plasticity, which may depend on age.

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Melatonin for sleep disorders: a bibliometric approach during the last 20 years

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Introduction: Melatonin is a neurohormone that it has high interest for sleep researchers. There are some substances uses for sleep disorders. In this sense, melatonin prolonged release has been approved like drug for treatment of primary sleep disorder, and included in a new class of drugs: melatonergic agonist. We would like to review, first of all the evolution of scientific research about use of melatonin in sleep disorder, and then the evolution of scientist's paper about melatonin's formulation, covering the period 1993–2012.

Materials and methods: Using Medline database we selected those document that content in their title one or several of the following descriptors: “sleep disorder*” and “melatonin*”. This study took into account all original articles, brief reports, reviews, editorials, letters to the editor, and so on. One of main bibliometric laws were applied: Price's Law on the increase in scientific literature. This law, undoubtedly the most widely used indicator for the analysis of productivity in a specific discipline or a particular country, takes into account an essential feature of scientific production, which is its exponential growth. Moreover, we conduct a sub-analysis for evolution to different formulation (immediate release and prolonged release melatonin).

Results: From the search on Pubmed 36,128 documents (sleep disorder) and 1,140 (combined with melatonin) were selected. In order to assess whether the growth of scientific production in sleep disorder and melatonin follows Price's Law of Exponential Growth, we carried out a linear adjustment of the data obtained, according to the equation $y = 5.9707x + 23.258$, and another adjustment to an exponential curve, according to the equation $y = 27.915e^{0.0927x}$. Mathematical adjustment to an exponential curve, allows us to obtain a correlation coefficient $r = 0.828$. On the other hand, linear adjustment to the measured values provides an $r = 0.924$. The reper-

toire analyzed is more suited to a linear adjustment than an exponential adjustment. Moreover, 2% of total documents corresponding to prolonged release melatonin. And of these, 80% have been published in the last 5 years.

Conclusion: To conclude a high papers on sleep disorder has been published, but for melatonin not fulfillment of Price Law. However, prolonged-release melatonin has increase in the last few years.

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Incidence of sleep disorders in a simple of down syndrome patients

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Introduction: Down syndrome is the most common congenital disease in new born babies. The face abnormalities, mental retardation and sleep disorders are the most common and persistent affectation in such population. Our study has aimed to evaluate the prevalence of different sleep disorders in a sample of Down syndrome patients belonging to the Down Syndrome Foundation of Madrid (FSDM).

Materials and methods: We send to the FSDM a total of 325 sleep questionnaire that the FSDM distributed among the families. Once completed by the families there were returned to us for evaluation. From a total of 172 questionnaires received, we have reviewed 119: 88 have been diagnosed and treated, 31 have been reviewed and are waiting for polysomnography, 36 have not yet been reviewed (impossible to locate, not be able to come yet), 16 didn't want to participate in the study and 1 missing.

Results: At this moment, with 88 patients reviewed and diagnosed, our study confirms a high incidence of obstructive sleep apnea-hypopnea syndrome (58.96%) from moderate to severe in Down population, in accordance with previous studies. Also a high incidence of gastroesophageal reflux (55.44%), bruxism (13.2%), primary snoring (14.96%), restless legs syndrome (2.64%), and narcolepsy (2.64%).

Conclusion: Incidence of sleep disorders is high between Down syndrome. There is also comorbidity of at least two sleep disorders in near 100% of the cases studied. It should be very important an early diagnosis and effective treatment of those sleep disorders to prevent a greater cognitive dysfunction. As we think the incidence of narcolepsy could be higher in Down syndrome than in normal population. Larger samples side are needed to confirm this preliminary results.

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Utility of pulse transit time in the detection of high blood pressure in patients admitted in a sleep unit

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Introduction: Pulse transit time (PTT) is the time that the pulse wave takes to travel between two different arterial points, and may be useful in estimating blood pressure. Being a free of charge noninvasive technique, it offers the advantage of avoiding "arousals"

during sleep by measuring with ambulatory blood pressure monitoring (ABPM). We aim to confirm the usefulness of PTT for the detection of hypertension, and to study the correlation between both measurements.

Materials and methods: Prospective observational study in a multidisciplinary sleep unit. We recruited 24 consecutive patients attending sleep clinic and ran a baseline PSG followed by an ABPM the following day. We calculated the average systolic and diastolic blood pressure (SBP, DBP) in the PTT and compared it with ABMP results.

Results: Mean age of 59 years. 67% male, 79% suffered from sleep apnea (OSAS). Considering the ABPM as the reference technique, we found that the diagnostic sensitivity of PTT is 82% with a specificity of 92% in the case of SBP, with a positive predictive value of 90% and negative predictive value of 86%. By studying the relationship between the mean SBP measured by the ABPM and PTT, we found a linear correlation coefficient (R2) of 0.87, showing a distribution of all subjects between ± 15 mmHg difference between tests. There is also a positive correlation between the mean DBP measured for the two tests.

Conclusion: Pulse transit time show a strong correlation with blood pressure measured by ABPM. Without assuming an additional cost, the PTT achieves continuous, non-invasive and cuff-less blood pressure monitoring and could be an alternative screening hypertension.

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Restless legs syndrome and its association with poor sleep quality, mood disorders, and one year cardiovascular mortality in patients on chronic dialysis

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Introduction: Restless legs syndrome (RLS) is common among uremic patients. We assessed RLS and its association with sleep quality, psychological well-being, and one year cardiovascular mortality in patients on chronic hemodialysis (HD) and peritoneal dialysis (PD).

Materials and methods: Patients on chronic HD and PD were consecutively included from two medical centers in Isfahan city (Iran). Diagnosis of RLS was based on the International Restless Legs Syndrome Study Group criteria, confirmed by the validated Cambridge-Hopkins questionnaire. Patients also completed the Pittsburgh Sleep Quality Index (PSQI) and the Hospital Anxiety and Depression Scale (HADS). Laboratory tests were done for iron state, kidney function, and electrolytes. Patients were followed for one year, cardiovascular mortality and new events were recorded. Univariate and multivariate analyses were performed to analyze the data.

Results: Ninety patients were evaluated (53 males, age = 54.2 ± 15.2 years, disease duration = 5.3 ± 4.5 years). RLS was diagnosed in 26.6% of the patients (35.1% in females vs. 20.7% in males, $P = 0.019$). Poor sleep quality was frequent in 86.6% of the cases in each group of the HD and PD patients. RLS severity was associated