Sleep habits in patients with stroke: necessity of sleep hygiene measures

Hábitos de sono de pacientes com acidente vascular cerebral: necessidade de medidas de higiene do sono

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ABSTRACT

Introduction/Objectives: Inadequate sleep habits can affect the physical and mental well-being of the individual; therefore, the aim of this study was to assess the sleep habits of patients with chronic stroke and the necessity of sleep hygiene measures.

Methods: A descriptive study was conducted, which involved 154 patients (90 men and 64 women): 55.2% ≥ 60 years of age and 44.8% < 60 years of age; 81 right brain-damaged and 73 left brain-damaged. The patients completed a Sleep Habits Questionnaire, validated in Brazil, with 47 questions related to family, housing, health, sleep and daily activities. The data were analyzed by the chi-square test. Results: The results showed that 63.6% of the patients had an additional person sleeping in their bedroom, 12.3% complained about too much noise in the room and 35% complained about too much light. Of these patients, 5.8% were smokers, and 7.8% were alcohol consumers and 70.1% were coffee drinkers. Regarding the sleep quality, 28.6% had difficulty initiating sleep, and 37.6% awoke in the middle of the night. In addition, 95% were unemployed, 80.5% did not perform physical activities, and 95.4% did not perform mental activities. Conclusion: These results indicate that many patients do not follow sleep hygiene measures, suggesting a requirement for sleep medicine measures so that these patients can learn lifestyle habits that ensure good quality of sleep.

Keywords: sleep hygiene, sleep medicine, sleep quality, stroke.

RESUMO

Introdução/Objetivos: Os hábitos inadequados de sono podem repercutir no bem-estar físico e mental do indivíduo, por isso, o objetivo do estudo foi de avaliar os hábitos de sono de pacientes crônicos com Acidente Vascular Cerebral e a necessidade de medidas de higiene do sono. Métodos: Foram realizado um estudo descritivo, no qual participaram 154 pacientes (90 homens e 64 mulheres), 55,2% ≥ 60 anos e 44,8% < 60 anos, 81 com lesão cerebral direita e 73 à esquerda. Os pacientes responderam a um Questionário de Hábitos de Sono, validado no Brasil, com 47 questões relacionadas com a família, moradia, saúde, sono e atividades diárias. Os dados foram analisados pelo teste Qui-quadrado. Resultados: Os resultados apontaram que 63,6% dos pacientes apresentavam mais uma pessoa no quarto de dormir, 12,3% se queixavam de muito barulho no quarto e 35% de muita iluminação. Dos pacientes avaliados, 5,8% fumavam, 7,8% bebiam e 70,1% tomavam café. Quanto ao sono, 28,6% apresentavam dificuldade de iniciar o sono e 37,6% acordavam no meio da noite. Foram apresentadas queixas de pesadelos (11%), sensação de sufoco (37,7%) e 35% sentiam muito sono durante o dia. Além disso, 95% não trabalhavam, 80,5% não realizavam atividades físicas e 95,4% não realizavam atividades mentais. Conclusão: Esses resultados indicam que muitos pacientes não seguem as medidas de higiene do sono, sugerindo a necessidade de atuação da Medicina do sono, a fim de que os pacientes aprendam hábitos de vida adequados que garantam uma boa qualidade de sono.

Descritores: acidente vascular cerebral, higiene do sono, medicina do sono, qualidade do sono.

INTRODUCTION

In several countries, infections and contagious diseases are being outranked by chronic degenerative diseases, among which stroke is the most common and can be the leading cause of death and disabilities(3).

This neurovascular disease exhibits a variety of clinical manifestations, depending on the type of lesion, its localization and the size of the affected area, as well as its nature and the compromised functions(5). Patients who have suffered a stroke exhibit neurological deficits that require rehabilitation from...
the initial post-stroke stage. Affected individuals often present sleep-related complaints and thus compromise the rehabilitation professional’s effort to apply exercises and other procedures that depend on the patient's attention, motivation and voluntary participation.

According to reports from the literature, neurobehavioral function is directly affected by the sleep and wake times, which, in turn, depend on sleep habits and lifestyles(5,6). Indeed, changes in the nighttime sleep pattern can lead to excessive daytime sleepiness, which is a predictive factor for various cognitive impairments, including reduced attention-concentration, spatial and temporal orientation, and memory performance, as well as compromised psychological and social functions, which can aggravate the symptoms and even the prognosis of medical disorders(4,5).

The recognition of sleep problems by healthcare professionals is an important component in the overall clinical approach. Furthermore, prevention or intervention measures concerning the conditions that contribute to sleep disorders, as well as the diagnosis and treatment of these disorders, are considerably important for health and quality of life. In this context, the patient’s own perception of his/her sleep is a primary and essential consideration in clinical practice.

In most cases, a large proportion of sleep disorders can be resolved with simple and efficient measures, such as behavioral therapy. Specifically, this therapy includes sleep hygiene measures and aims to teach the patient appropriate life habits that ensure good sleep quality. Sleep hygiene comprises a set of common measures, such as avoiding physical activity and the consumption of stimulant substances (such as caffeine) a few hours before sleeping and removing televisions, computers and any other factors that can compromise sleep from the bedroom. It is also ideal to remain in a dark environment without noise before sleeping to produce the neurological adaptations that lead to sleep(5,6).

Based on the above information, we presume that inadequate sleep habits can have an impact on the individual’s physical and mental well-being. Therefore, the aim of the present study was to evaluate the sleep habits of chronic stroke patients and to discuss the necessity of sleep medicine measures.

**METHODS**

**Participants**

The sample consisted of 154 patients (90 men and 64 women) diagnosed with a first stroke episode, as recorded in physiotherapy departments, with a mean recovery time of 26.5 ± 33 months. The patient exclusion criteria were as follows: recurrent brain lesions, severe cognitive disorders, aphasia and the use of anti-anxiety drugs, antidepressants or neuroleptics.

**Procedures**

The present study was approved by the Research Ethics Committee under process number 193/2006. All participants were informed about the research procedures and signed an informed consent form.

A subjective evaluation of the participants’ sleep was performed using the Sleep Habits Questionnaire, which was administered by an interview. The questionnaire is a validated and standardized instrument with 47 questions that aim to define the profile of the evaluated individual, rendering information about his/her family, housing, health, sleep and daily activities(7). Some of the information obtained from the above-mentioned instrument was used to identify sleep disorder-related complaints, such as subjective reports of a sleeping problem; complaint of insomnia, defined as difficulty initiating sleep and/or wakening at night and not being able to fall back asleep; nightmares; awaking with a feeling of suffocation; and daytime sleepiness.

**Data analysis**

Data were analyzed with the SPSS 15.0 software (Statistical Package for the Social Sciences, IBM, Armonk, New York, USA), with a 5% significance level in all statistical tests. The frequency of sleep complaints was compared with a chi-squared test.

**RESULTS**

There was no statistically significant difference between the frequency of female and male individuals or between the age ranges ≥ 60 years and < 60 years in the studied sample. As for the educational level, there was no statistically significant difference between patients with no education and those with some level of education (Table 1).

**Table 1. Sample characterization according to gender, age, education level and side of the brain lesion.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (p = 0.052)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>64</td>
<td>41.6</td>
</tr>
<tr>
<td>Male</td>
<td>90</td>
<td>58.4</td>
</tr>
<tr>
<td>Age (p = 0.219)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 60 years</td>
<td>85</td>
<td>55.2</td>
</tr>
<tr>
<td>&lt; 60 years</td>
<td>69</td>
<td>44.8</td>
</tr>
<tr>
<td>Education level (p &gt; 0.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal education</td>
<td>24</td>
<td>15.6</td>
</tr>
<tr>
<td>Elementary, incomplete</td>
<td>58</td>
<td>37.7</td>
</tr>
<tr>
<td>Elementary, complete</td>
<td>28</td>
<td>18.2</td>
</tr>
<tr>
<td>Secondary, incomplete</td>
<td>44</td>
<td>28.6</td>
</tr>
<tr>
<td>Brain lesion (p = 0.458)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>81</td>
<td>52.6</td>
</tr>
<tr>
<td>Left</td>
<td>73</td>
<td>47.4</td>
</tr>
</tbody>
</table>

Five domains were evaluated by the Sleep Habits Questionnaire: family, housing, health, sleep and daily activities. Regarding the factors related to family and housing, the patients were found to live with up to nine persons in the same household, and 63.6% shared a room with at least one person. Moreover, at least 12.3% of the patients complained about noise in the room, and 35% complained about too much light during the night.
Sleep habits in patients with stroke

According to the analysis of health-related aspects, few patients were smokers and drank alcohol, but most were coffee drinkers. Furthermore, many of the patients were unemployed and performed no physical and mental activities (Figure 1).

Finally, regarding the sleep information obtained, 35.7% of the patients reported experiencing some type of sleeping problem. Specifically, the complaints were related to difficulties initiating sleep, waking at night and having difficulties falling back asleep, nightmares, waking at night with a feeling of suffocation and daytime sleepiness (Figure 2).

DISCUSSION

According to the Sleep Habits Questionnaire, it is important to assess family and housing conditions (i.e., to investigate the number of persons living in the same household, whether the individual sleeps in the bedroom with more than one person and the levels of noise and light in the bedroom) to evaluate the individual's sleep state. Given that the patients from the studied sample use the public health system, it was expected for most of them to live under low financial conditions and to thus report a high number of persons living in the same household. This assumption was confirmed because there were records of up to nine persons per household. This result suggests that a higher number of persons in the household and in the bedroom can increase the noise level, which leads to difficulties in initiating or maintaining sleep and can thus directly affect the sleep quality of these individuals.

The exhibited data show that there were complaints about noise in the bedroom and too much light during the night. These findings indicate a requirement for patient and family member awareness about the necessity of keeping the bedroom silent during the night and of avoiding light in the bedroom, which, for example, may change the sleeping times.

When analyzing the health-related aspects, we found no high rates of smoking and drinking. These are encouraging results, given that, in addition to the damage nicotine causes to the respiratory and cardiovascular systems, this substance also affects behavior, concentration, sleep and eating habits. Nicotine has also been shown to interfere with the sleep-wake cycle. Some authors have shown that the stimulation of nicotine receptors promotes waking, reduces the total sleep time and disturbs REM sleep. Alcohol consumption in turn may be associated with increased blood pressure, coagulation factors and cardiac arrhythmia, as well as with an increased risk of hemorrhagic stroke.

Conversely, we observed a high frequency of coffee drinkers. According to the literature, caffeine interferes with the total sleep duration and can lead to poor sleep quality. In Brazil, habit of drinking coffee mainly at night (for example, during dinner) is very common. Thus, these patients should be instructed to avoid drinking coffee before going to bed to preserve their sleepiness. Caffeine reduces the secretion of melatonin, which is a sleep-regulating hormone produced by the pineal gland. If caffeine is consumed excessively or at unsuitable times, the wake time is increased, and the total sleep time is reduced.

In the studied sample, we found complaints related to difficulties initiating sleep and to awaking at night and having difficulty falling back asleep, which can be suggestive of insomnia. The higher prevalence of patients with sleep problems after suffering a stroke suggests an association between this pathology and sleep disorders. In a study by Vock et al. that evaluated patients after an ischemic stroke, a higher frequency of sleep changes was found compared with the pre-stroke period. Furthermore, when evaluating the frequency and severity of sleep disorders in patients who had suffered a hemorrhagic stroke, Schuiling et al. found that all studied patients reported the sleeping problems as having begun after the disease.

In the literature, insomnia has been demonstrated to be a common complaint after an ischemic stroke. According to Kryger et al., complaints of insomnia and excessive sleepiness are sleep disorder symptoms that are also considered disease markers and predictors of increased mortality. The bedroom conditions and coffee drinking habits evidenced in the present study are factors that can contribute to the occurrence of complaints suggestive of insomnia.

Patients also complained about nightmares, waking up at night with a feeling of suffocation and daytime sleepiness. In a study by Foley et al., stroke was associated with the occurrence...
of one or more sleeping problems, such as difficulties falling and remaining asleep and daytime sleepiness. Davies et al. found that daytime sleepiness is significantly associated with stroke. In further agreement with the exhibited results, Müller et al. have shown that stroke patients exhibit a higher frequency of wake episodes after initiating sleep and poorer sleep efficiency than control individuals. The study of Chasens et al. evidenced a relationship between sleepiness and sleep quality, given that individuals with daytime sleepiness reported a worse sleep quality than those exhibiting no daytime sleepiness. Furthermore, the complaints about the feeling of suffocation and daytime sleepiness may be strong indicators of obstructive sleep apnea syndrome. This disease is a common condition in stroke patients, being a risk factor for recurrent stroke and associated with a poor prognosis. The mechanisms involved in the association between stroke and obstructive sleep apnea syndrome have been thoroughly investigated. Therefore, patients exhibiting these complaints should be referred to a sleep laboratory for diagnosis and treatment.

Another important result found in the present study was that most of the patients were unemployed and performed no physical and mental activities. This evidence is concerning because the literature states that physical activity reduces the risk of stroke by 27%, whereas a sedentary lifestyle increases the risk not only of a first stroke episode but also of recurrent events. Furthermore, physical exercise favors better sleep quality, contributes to weight loss and improves severe obstructive sleep apnea syndrome. One of the sleep hygiene measures recommends that the individual expose himself/herself to sunlight, which helps to synchronize the circadian sleep-wake rhythm and prevents insomnia events.

The sleep complaints observed in the present study can have several consequences. Specifically, chronic sleep deprivation can affect the emotional state, behavior and cognitive functioning and thus lead to a poor quality of life and social and family disorganization. Considering the influence knowledge has on behavior, we believe that educating individuals regarding sleep hygiene measures, i.e., behavioral practices, can favor sleep quality and prevent the worsening of sleep disorders.

The present study exhibited certain limitations. The relationship between sleeping problems and the specific localization of brain lesions was not assessed because the neuroimaging exams were performed in different hospitals and thus did not allow for standardization of the medical reports. Furthermore, analyzing the influence of the circadian system on sleep regulation in these patients, as well as a more objective evaluation of the sleep complaints, would be important. Another limitation of the present study was the lack of a control group, which is the reason that the results cannot be extrapolated to the entire stroke patient population.

CONCLUSION

The present study reveals that stroke patients exhibit complaints related to family, housing, health, sleep and daily activities. The results show that many patients do not follow sleep hygiene measures. This finding suggests a requirement for sleep medicine procedures to educate these patients regarding adequate life habits and to thus ensure good sleep quality.

Acknowledgments

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Conflicts of interest

None.

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Sleep habits in patients with stroke