Sleep Quality Assessment and Daytime Sleepiness of Liver Transplantation Candidates

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ABSTRACT

Objective. The goal of this study was to evaluate the sleep quality and daytime sleepiness of patients eligible for liver transplants.

Methods. A cross-sectional prospective study was conducted on liver transplant candidates from a transplant center in the interior of São Paulo State. The Pittsburgh Sleep Quality Index and Epworth Sleepiness Scale questionnaires were applied to obtain demographic and clinical characteristics and to assess sleep quality and daytime sleepiness.

Results. The mean (±SD) score on the Epworth Sleepiness Scale of the 45 liver transplantation candidates was 7.00 ± 2.83 points, with 28.89% having scores >10 points, indicating excessive daytime sleepiness. The mean score on the Pittsburgh Sleep Quality Index was 6.64 ± 4.95 points, with 60% of the subjects showing impaired sleep quality, with scores >5 points. The average sleep duration was 07:16 h. Regarding sleep quality self-classification, 31.11% reported poor or very poor quality. It is noteworthy that 73.33% of patients had to go to the bathroom, 53.33% woke up in the middle of the night, and 40.00% reported pain related to sleeping difficulties. Comparison of subjects with good and poor sleep quality revealed a significant difference in time to sleep ($P = .0002$), sleep hours ($P = .0003$), and sleep quality self-classification ($P = .000072$).

Conclusion. Liver transplant candidates have a compromised quality of sleep and excessive daytime sleepiness. In clinical practice, we recommend the evaluation and implementation of interventions aimed at improving the sleep and wakefulness cycle, contributing to a better quality of life.

THE FIRST liver transplantation was a milestone for individuals with end-stage chronic and acute liver diseases, opening a new path for patient recovery. Thomas Starzl, in 1963, was the first to execute liver transplantation in humans, although the first attempts were unsuccessful [1]. The success of this modality was obtained with the discovery of immunosuppressants and organ preservation solutions and the development of surgical techniques that greatly contributed to the results of liver transplantations [2]. Since then, liver transplantation has become accepted as a clinical-surgical treatment, no longer considered to be an experimental procedure.

Despite the great advances in liver transplantation, because of the long time on the waiting list, candidates must follow an anguishing long path before fulfilling their dream of a normal life. During this period, biologic and psychologic factors are a source of concern during patient monitoring. The biologic factors are related to the worsening clinical signs and symptoms of chronic liver disease, often involving progression to various complications such as jaundice, portal hypertension, ascites, nutritional

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deficiencies, and hepatic coma [3]. The psychologic factors may involve emotional states resulting from the day-to-day doubts and fantasies occurring during the preoperative period, such as feelings of anxiety, stress, anguish, and fear, among others [4].

The information acquired by the patient about the liver transplantation process is of fundamental help for his recovery. However, a large quantity of information may overload the mental state of individuals who are already experiencing the psychologic stress linked to waiting for the transplant. Mental and emotional fatigue may be associated with this cognitive overload, causing a reduced level of quality of life [5].

According to the literature, fatigue and sleep quality are fundamental elements observed when measuring the quality of life of patients before and after a liver transplantation, because patients with chronic liver disease commonly exhibit some type of sleep disorder [5,6].

A reduced number of hours of sleep may cause various physiologic changes, such as modification of the levels of hormones produced by the body, difficulty in concentration, irritability, mood changes, and reduced capacity to execute tasks, these being some of the short-term consequences observed. In contrast, long-term effects are obesity, early aging, diabetes mellitus, and cardiovascular and gastrointestinal diseases [5,7]. These changes may lead to even more aggravating complications among patients waiting for a liver transplant.

When their sleep needs are impaired, people feel more sleepy during the daytime, with a possible negative influence on their professional and social life and the execution of their daily tasks [8,9]. In addition to the impairment of daily activities, poor-quality sleep may generate other problems, such as increased incidence of pain, greater utilization of health services, a tendency to a poor evaluation of one's own health, and impaired family and social relationships [10].

As previously stated, the lack of this daily rest may result in damage to relatively healthy individuals, but the negative effects on the health of people with liver disorders have not been extensively studied, a limitation pointed out in the international literature regarding this clientele [5]. In the present investigation, we sought to assess the sleep quality of patients on the waiting list, ie, candidates for liver transplantation, to obtain more in-depth knowledge about this topic and to advise the transplant teams about the importance of sleep for these patients. We used 2 questionnaires validated in the literature for the Brazilian culture: the Pittsburgh Sleep Quality Index (PSQI) [11] and the Epworth Sleepiness Scale (ESS) [12].

It should be pointed out that the assessment of sleep quality is a complex task, because it involves quantitative parameters, such as sleep duration, sleep latency, and number of awakenings during sleep, as well as qualitative parameters, such as the occurrence of excessive daytime sleepiness. The PSQI permits assessment of the incidence of severity and the nature of the sleep disorder, whereas the ESS was developed to assess excessive daytime sleepiness, ie, the possibility of dozing off in daytime situations [11,12].

In view of the above considerations, the assessment of sleep quality among candidates for liver transplantation is valid and fundamental, because it permits the identification of intervening factors for the sleep quality of these patients and may provide a basis for interventions on the part of health professionals of the transplant team to improve the sleep pattern and to contribute to the treatment of these patients. Therefore, the objective of the present study was to assess the sleep quality and daytime sleepiness of candidates for liver transplantation.

METHODS

A prospective, cross-sectional study was conducted at a public general hospital in the interior of the State of São Paulo and registered in the National Transplant System of the Health Ministry according to Law no 9,434 of February 4, 1997. The liver transplantation candidates were assessed by the medical and multiprofessional teams during scheduled follow-up visits in the liver transplant outpatient clinic. Data were collected over a period of 6 months by means of individual interviews in a private environment.

The target population consisted of candidates enrolled in the technical registry of liver transplantation awaiting a transplant from a deceased donor. At the outpatient clinic, the patients attended periodic visits held trimonthly, monthly, or weekly according to their classification with the use of the Model for End-Stage Liver Disease (MELD) and the occurrence of complications of chronic liver disease. The sample consisted of 45 candidates for liver transplantation who fulfilled the proposed selection criteria during the period of data collection.

Selection criteria were: age $\geq$18 years and candidates for a liver transplant from a deceased donor who were able to read and write to fill out the data collection form. Exclusion criteria were: subjects who verbally expressed or who showed clinical conditions unfavorable for filling out the data collection form or who refused to participate in the study at any time during the investigation.

Data were collected by means of a questionnaire for the sociodemographic and clinical identification of the patients containing the following data: age, date of birth, gender, place of birth (urban or rural zone), marital status, religion, complete address, telephones for contact, profession, occupation, number of children, time away for work, schooling (years of study), family income, MELD classification (used to assess the severity of chronic liver disease), body mass index, date of enrollment in the technical registry for transplantation, medical diagnosis, presence of diabetes mellitus and systemic arterial hypertension, and medications being used.

Sleep quality was assessed with the use of the PSQI [11], which contains 19 self-applicable items and 5 items to be answered by the roommate which evaluate sleep aspects during the past month. The questionnaire contains 7 components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disorders, use of sleep medications, and daytime dysfunction. Each of the 7 components receives a score from 0 to 3 points, with the maximum score ranging from 0 to 21 points. Higher scores indicate poorer sleep quality. A global score of $>$5 shows that the individual is experiencing great difficulties in at least 2 components or moderate difficulties in more than 3 components.

Excessive daytime sleepiness was assessed with the use of the ESS [12], a self-applicable questionnaire that evaluates the probability of drowsiness in 8 situations involving daily life activities known to be highly sleep inducing. The scale ranges from 0 to 3