Sleep quality and sleepiness characteristics in first trimester expectant mothers

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Abstract

Purpose
Because sleep is essential for normal pregnancy-associated physiological changes and healthy fetal development it is important to provide advice to first trimester expectant mothers in order to enhance self-care. Therefore, the aims of the present study are to clarify first trimester sleep quality and sleepiness characteristics, and to elucidate the affects of stress on sleep and sleepiness characteristics.

Methods
Self-administered questionnaires were distributed to 46 first trimester expectant mothers who were recruited from outpatient departments of two hospitals in Hiroshima, Japan between April 2007 and January 2008. The questionnaire was composed of the Pittsburgh Sleep Quality Index (PSQI), the Epworth Sleepiness Scale (ESS), a sleep log, and the Perceived Stress Scale (PSS).

Results
The average global score of the PSQI (PSQIG) was 6.67 (±3.20), and 65.2% of participants exceeded the cut-off score. Participants with higher perceived stress had significantly higher PSQIG scores (r=0.38, n=46, p<0.01). There was a positive correlation with PSQIG (r=0.40, n=46, p<0.01) and regularity of bedtime, indicating that participants with well-regulated daily habits have lower PSQIG scores. The average ESS score was 10.1 (±4.3), with 50.0% of participants scoring 11 points or higher. Moreover, primipara had higher scores than multipara (un-paired t (44)=2.52, p <0.05), and those participants with more children had lower scores (r=-0.32, n=46, p<0.05). Sleepiness duration and nap duration were not significantly different for parity. For employment (employed or not-employed), nap duration was significantly different (un-paired t (27)=2.27, p<0.05), however, there was no significant difference in sleepiness duration.

Conclusion
This study has shown that first trimester expectant mothers have markedly poor sleep quality and higher levels of sleepiness when compared to women of the same age in the general population. In addition, this study suggests that sleep quality is improved by controlling stress and by having well regulated sleep habits.

Key words: sleep quality, sleepiness, first trimester, stress

I. Introduction

When compared to non-expectant mothers, expectant mothers exhibit increased nocturnal sleep time and time spent in bed. However, they also have difficulty maintaining sustained sleep, and sleep efficiency is lowered (Hertz, 1992; Suzuki et al., 1994; Lee et al., 2000). These changes in sleep architecture have been observed at the initial stages of pregnancy (Hedman et al., 2002; Lee et al., 2000). Moreover, sleep has been shown to be essential for normal pregnancy-associated physiological changes and fetal development because of the increased risk of pregnancy-induced-hypertension (PIH) and a small-for-gestational-age birth in expectant mothers who snore or have sleep-disordered-breathing (SDB) (Loube, 1996; Franklin et al., 2000). Changes in sleep...
pattern and increased daytime sleepiness during the first trimester have also been clinically observed, however, few studies have used standardized scales to evaluate sleepiness or clarify sleepiness time.

Changes in sleep quality and sleepiness architecture during pregnancy can be caused by rapid and significant changes in the expectant mother’s hormonal environment (Lancel et al., 1996). Also, surveys of the general population and the employed have reported that those who have higher stress levels have shorter sleep time (Kim et al., 2000; Nakata et al., 2004), and stronger daytime sleepiness (Kaneita et al., 2005). Studies have suggested that expectant mothers who have poor sleep may have higher stress levels. Particularly during the first trimester, or even when conception is being pursued, various stresses are felt due to pregnancy-associated physiological and psychosocial changes, but little is known regarding the relation of stress levels in the first trimester to sleep quality, or sleepiness. Consequently, if we can clarify first trimester sleep quality and sleepiness characteristics and their relationship to stress, we will be able to design enhanced self-care programs for expectant mothers that will improve their sleep habits.

Therefore, the aims of the present study are to clarify characteristics of sleep quality and sleepiness in the first trimester, and to elucidate the relationship of stress to sleep and sleepiness patterns.

II. Method

1. Participants:

The participants were 51 expectant mothers, with a maximum of 16 weeks gestation, who received medical examinations in the Obstetrics and Gynecology Outpatient Departments of two hospitals in Hiroshima Prefecture, Japan. Participants with hypertension, diabetes, psychiatric disorders, or other serious medical complications or illnesses, as well as non-native speakers of Japanese, were excluded from the study. The investigation period was from April 2007 to January 2008. Volunteers from the nursing staff at each hospital explained the research protocol and data collection process to prospective participants who were present for scheduled medical examinations. After obtaining participants’ cooperation and written consent, questionnaires and sleep logs were distributed and collected by return-mail. The questionnaire was composed of the Pittsburgh Sleep Quality Index, the Epworth Sleepiness Scale, the Perceived Stress Scale, and questions concerning demographic data. Moreover, participants recorded sleep logs for 3 to 5 weekdays. This study was approved by the Osaka University School of Health Science Ethics Committee (Approved March 2007, #11). Fifty (98.0%) of 51 distributed questionnaires were collected but four participants’ Pittsburgh Sleep Quality Index or sleep logs were rejected because of invalid responses. The remaining 46 (94.0%) were valid responses and were used in the analysis.

2. Instruments:

1) Pittsburgh Sleep Quality Index

The Pittsburgh Sleep Quality Index (PSQI) was used to evaluate participants’ sleep quality. The PSQI is a widely used standardized scale that evaluates respondents previous months sleep quality. The PSQI has been standardized, and its validity and reliability verified for use with Japanese (Doi, et al., 2000). The 18 items of the self-rated PSQI assess sleep quality, sleep duration, sleep onset, sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction, which form seven component scores. The sum of component scores yields a Global score (PSQIG) ranging from 0 to 21, a high score indicating a sleep complaint. A cut-off value of 5.5 points yields optimum sensitivity and specificity in distinguishing sleep disorders (Doi et al., 2000), and is therefore used in our analysis.

2) Epworth Sleepiness Scale

The Epworth Sleepiness Scale (ESS) is a questionnaire that evaluates perceived sleepiness in eight situations commonly encountered in daily life (Johns, 1991). A high score on a 0 to 3 point Likert-scale indicates a strong perception of sleepiness during a given daily activity. Because execution is simple, it is frequently used as a subjective measurement of Excessive Daytime Sleepiness (EDS). We used Fukuhara et al.’s (2006) JESS modified for Japanese participants, which has been validated and reliability verified, and standardized. Total ESS scores range from 0 to 24, with scores
of 2 to 10 indicating a normal range (Johns, 1993; Johns, 2000). This range is also the accepted standard in research with Japanese participants (Doi et al., 2000; Doi & Minowa, 2003; Takegami et al., 2005), and therefore we considered a score of 11 points or more as indicative of EDS.

3) Sleep log

Participants kept sleep logs making entries in mornings and evenings for 3 to 5 days, recording times for bedtime, sleep onset, waking time, rising time, times for strongly felt sleepiness and nap time. Participants kept sleep logs for weekdays only in order to clarify differences in sleep habits and sleepiness state between employed and not employed expectant mothers, and to exclude the influence of family weekend behavior on expectant mothers’ sleep habits. The sleep log was adapted from Akimoto et al., (1960) which is widely used in neuropsychology in the diagnosis of sleep states. We verified all log entries visually, and then divided entries into 15 minute intervals which composed the sleep pattern. Each participant’s daily entries for time and duration were given a mean value and analyzed. We referred to a study by Shimada et al. (1993) where the standard deviation (SD) of average sleep onset was regarded as regularity of sleep-wakefulness rhythm, and the SD of average bedtime, and average rising time were regarded as regularity of bedtime and rising time, respectively. Moreover, in order to clarify the distribution rate for perceived sleepiness, the number of participants who perceived sleepiness at each interval was divided by the total number of days to give the sleepiness rate.

4) Perceived Stress Scale

We used a Japanese translation (Sumi, 1997) of a ten-item Perceived Stress Scale (PSS) (Cohen & Williamson, 1988) modified from Cohen et al.’s (1983) original. Scores for each of the ten items range from 0 to 4, with a total PSS score range of 0 to 40. A higher score indicates a higher degree of stress perception. The PSS is a standardized assessment that measures the degree to which respondents feel daily-life situations are stressful, and find their lives to be unpredictable, uncontrolled, and overwhelming. Expectant mothers are not only conscious of the stress associated with pregnancy, but also conscious of stress arising from daily living. Although these different sources of stress are difficult to separate and analyze, PSS items are suitable for assessing stress associated with pregnancy and daily life. Therefore, we confirmed content validity of the PSS for use with expectant mothers. The PSS is widely used to evaluate stress during the perinatal period (Hurley et al., 2005; Corwin et al., 2005). In this study, Cronbach’s alpha reliability for expectant mothers was 0.80.

3. Analysis:

Statistical Package for Social Sciences (SPSS) ver.16.0L was used for statistical analysis. In a bivariate analysis, we used 2-tailed t-tests to test for significant differences between means for continuous variables such as PSQI, ESS, PSS scores, and sleeping habits. The χ² test was used to test for significant differences in categoric variables such as parity and, employed or not employed. Household groups were compared using one-way analysis of variance, and data of pairs of groups were analyzed using Tukey’s multiple comparison.

PSQI scores, ESS scores, sleepiness duration, nap duration, and relationships between variables (age, gestation week, BMI, PSS score, sleep habits SD) were assessed using Pearson’s product-moment correlation coefficient.

III. Results

1. Participants

The demographic characteristics of the participants are shown in Table 1.

Perceived stress as indicated by PSS scores ranged from 7 to 38 points, with an average of 20.7 (±5.9) points. There was no significant difference in PSS scores for parity, employment (employed or not-employed), or symptoms of nausea, itching, headache or back pain. Moreover, there was no relationship between PSS scores and age, gestation week, BMI, PSS score, sleep habits SD) were assessed using Pearson’s product-moment correlation coefficient.

2. PSQI and Sleep Quality

Average PSQIG was high at 6.67 (±3.20) points, with 30 (65.2%) participants exceeding the cut-off of 5.5 points. Component scores are shown in Table 2. No
participant took sleep medication.

3. Perception of Sleepiness and Naps

The ESS average score was 10.1 (±4.3) points, and 23 (50.0%) participants exhibited EDS. Periods of sleepiness, sleepiness duration, and nap time are shown in Table 3. Periods of sleepiness occurred throughout the day, from immediately after rising until bedtime. Sleepiness start times were from 8:15 to 21:30, and sleepiness ending times were from 9:00 to 23:00. Average rising times and bedtimes were 7:18 (±1.58) and 22:94±(1.22), respectively. Moreover, duration of sleepiness was from 25 minutes to 3 hours, with an average of 72.4 (±33.6) minutes. Figure 1 shows the hourly sleepiness rate. There are two peaks for perception of sleepiness, one at 11:00, and the second from 14:00 to 15:00. More than 10%

Table 1 Demographic data and correlation with the Perceived stress scale score for pregnant women in their 1st trimester

<table>
<thead>
<tr>
<th></th>
<th>First trimester (n=46)</th>
<th>Correlation with PSS†</th>
<th>p-Value‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (mean(SD))</td>
<td>29.9 (4.8)</td>
<td>n.s.</td>
<td>−</td>
</tr>
<tr>
<td>Gestational Week (mean (SD)) weeks</td>
<td>12.3 (1.8)</td>
<td>n.s.</td>
<td>−</td>
</tr>
<tr>
<td>Parity (no.(%))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primipara</td>
<td>21 (45.7)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>Multipara</td>
<td>25 (54.3)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>Previous child (no.(%))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>15 (32.6)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9 (19.6)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>3 or more</td>
<td>1 (2.2)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>Employed (no.(%))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20 (43.5)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>26 (56.5)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>BMI (mean(SD))</td>
<td>20.8 (2.3)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>Household (no.(%))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>married with no children</td>
<td>20 (43.5)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>nuclear family</td>
<td>19 (41.3)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>extended family</td>
<td>6 (13.0)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>other</td>
<td>1 (2.2)</td>
<td>n.s.</td>
<td></td>
</tr>
<tr>
<td>Perceived stress scale score</td>
<td>20.7 (5.9)</td>
<td>n.s.</td>
<td></td>
</tr>
</tbody>
</table>

† Pearson’s product-moment correlation was used to examine the relation between the Perceived stress scale score and demographic variables
‡ Un-paired t-test was used to test for significant differences between Perceived stress scale and demographic variables
§ One-way ANOVA was used to test for significant differences between Perceived stress scale and household type
n.s.=not significant, —=not analyzed

Table 2 Means and standard deviations of component and global scores of the Pittsburgh Sleep Quality Index (PSQI) for first trimester expectant mothers (N=46)

<table>
<thead>
<tr>
<th>Score</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep quality</td>
<td>1.22</td>
<td>0.76</td>
</tr>
<tr>
<td>Sleep latency</td>
<td>1.22</td>
<td>1.02</td>
</tr>
<tr>
<td>Sleep duration</td>
<td>0.87</td>
<td>0.83</td>
</tr>
<tr>
<td>Sleep efficiency</td>
<td>0.70</td>
<td>0.87</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>1.22</td>
<td>0.66</td>
</tr>
<tr>
<td>Hypnotic medication use</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Daytime dysfunction</td>
<td>1.15</td>
<td>0.76</td>
</tr>
<tr>
<td>Global scale</td>
<td>6.67</td>
<td>3.20</td>
</tr>
</tbody>
</table>

Figure 1 Rate of sleepiness of first trimester expectant mothers
Rate of sleepiness is calculated from sleep log data of 46 participants, with a total of 197 days. Participants who had perceived sleepiness recorded sleepiness at 15 minute intervals. The number of participants who perceived sleepiness at each interval was divided by the total number of days (197) to give the sleepiness rate. Periods of sleepiness occurred throughout the day, from immediately after rising until bedtime. Average rising times and bedtimes were 7:18±(1.58) and 22:94±(1.22), respectively. There are two peaks for perception of sleepiness, one at 11:00, and the second from 14:00 to 15:00. More than 10% of participants perceived sleepiness between 13:30 and 16:00.
of participants perceived sleepiness between 13:30 and 16:00. In addition to nocturnal sleep time, 29 participants reported daytime naps or time spent in bed averaging 70.4 minutes (7.5 min to 4 hr 25 min). There was no significant relationship between ESS scores and duration of sleepiness, or nap duration.

### 4. Factors Relating Sleep and Sleepiness

1. There was no significant relationship between PSQI scores and parity, employment, or any other participant attribute. On the other hand, there was positive correlation between PSQIG and PSS scores (PSQIG: r = 0.38, n = 46, p<0.01). Sleep quality (r=0.39, n=46, p<0.01), sleep disturbance (r=0.42, n=46, p<0.01) and daytime dysfunction (r=0.33, n=46, p<0.01) were positively correlated with PSS scores. Moreover, the average SD for bedtime and rising time was 0.67±0.52 hours and 0.60±0.59 hours, respectively. PSQI was positively correlated with bedtime SD (r=0.40, n=46, p<0.01). In other words, participants who kept regular bedtimes had lower PSQI scores (Table 4).

2. ESS scores for primipara were significantly higher (un-paired t(44)=2.52, p<0.05) than scores for multipara. Moreover, a negative correlation was found between the number of children (r=-0.32, n=46, p<0.05) and ESS scores. Duration of sleepiness was correlated with age (r=-0.32, n=39, p<0.05). For participants who were able to take naps, there was a significant difference (un-paired t(27)=2.27, p<0.05) in average nap time between employed (11 participants, 55.0%), 39.8 (±29.9) minutes and not employed (18 participants, 69.2%), 89.1 (±67.9) minutes. There was no relationship between ESS scores and, length of sleepiness, sleep habits SD, employment, BMI, or PSS score (Table 4).

### IV. Discussion

This research has clarified sleep quality and sleepiness characteristics of first trimester women using PSQI, ESS, and sleep logs. Moreover, we have also clarified

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**Table 3** Perception of periods of sleepiness, sleepiness duration, and nap duration in the first trimester

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Perceived sleepiness or napping</th>
<th>Mean</th>
<th>Standard error</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start time of sleepiness (time of day)</td>
<td>37</td>
<td>14.00</td>
<td>2.80</td>
<td>8.25 to 21.50</td>
</tr>
<tr>
<td>End time of sleepiness (time of day)</td>
<td>37</td>
<td>15.21</td>
<td>2.73</td>
<td>9.00 to 23.00</td>
</tr>
<tr>
<td>Sleepiness duration (minutes)</td>
<td>37</td>
<td>72.4</td>
<td>33.6</td>
<td>25.0 to 180.0</td>
</tr>
<tr>
<td>Nap duration (including time spent in bed) (minutes)</td>
<td>29</td>
<td>70.4</td>
<td>60.9</td>
<td>7.5 to 265.0</td>
</tr>
</tbody>
</table>

**Note.** Each is derived from the average of individual participants sleep log data

**Table 4** Correlations between sleep quality, sleepiness characteristics, and related factors

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of children</th>
<th>PSS</th>
<th>Regularity of sleep habits¹</th>
<th>Bedtime</th>
<th>Rising time</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSQIG</td>
<td>n.s.</td>
<td>n.s.</td>
<td>0.38 **</td>
<td>0.42 **</td>
<td>n.s.</td>
</tr>
<tr>
<td>Sleep quality</td>
<td>n.s.</td>
<td>n.s.</td>
<td>0.39 **</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Sleep latency</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>0.30 *</td>
<td>n.s.</td>
</tr>
<tr>
<td>Sleep duration</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Sleep efficiency</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>0.44 **</td>
<td>n.s.</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>n.s.</td>
<td>n.s.</td>
<td>0.42 **</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Daytime dysfunction</td>
<td>n.s.</td>
<td>n.s.</td>
<td>0.33 *</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>ESS</td>
<td>n.s.</td>
<td>-0.32 *</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Sleepiness duration</td>
<td>-0.32 *</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

**Note.** Definition of abbreviations: PSQIG: Pittsburgh sleep quality index Global score; ESS: Epworth sleepiness scale

¹Regularity of sleep habits were indicated by the mean of standard deviation of each time for participants.

*p<.05, **p<.01
levels and the regulation of sleep habits influence sleep quality. Our results suggest that stress and nap duration.

strength of sleepiness, or between strength of sleepiness is no relationship between duration of sleepiness and time to bedtime, and in particular, more frequently expectant mothers perceive sleepiness throughout the day, from waking to bedtime, and in particular, more frequently between 13:00 to 16:00. We find it interesting that there is no relationship between duration of sleepiness and nap duration.

This study investigates factors that influence first trimester sleep quality. Our results suggest that stress levels and the regulation of sleep habits influence sleep quality. In particular, expectant mothers who evaluate their sleep quality as low, or who report frequent sleep disturbances, have strongly perceived stress. This suggests that there is a relationship between sleep and stress levels, as in the general adult population (Suka et al., 2003). These stress levels are not related to attributes such as age or employment. Moreover, stress is not correlated with minor symptoms, such as nausea and back pain, or physiological changes associated with pregnancy such as gestational week. This suggests that first trimester sleep quality is related to, as Cohen et al. (1983) have said, the degree to which respondents feel stress in their daily-life situations. On the other hand, expectant mothers who retire to bed at consistent times most days have higher sleep quality. There was no difference in PSQI scores between employed or not-employed participants. However, a study of first trimester expectant mothers that included a similar percentage of multipara (Okun et al., 2007: 42.9%) as our study (54.3%), reported lower PSQI scores (4.76±2.3, n=35). In Okun et al.’s study 82.9% of expectant mothers were working, while in our investigation only 43.5% of expectant mothers were working. Therefore, we might speculate that because an employed expectant mothers’ daily habits are more regulated than an unemployed expectant mother, Okun’s reported PSQI scores would be lower. Thus, this study suggests that a well-regulated life is essential to improving sleep quality.

Primipara perceive stronger daytime sleepiness than multipara, and the more children multipara have the lower is their perceived level of sleepiness. Moreover, younger mothers feel sleepiness longer. ESS scores for women in general population in their 20s (5.65±3.92) are higher than scores for women in their 30s (4.64±3.34) (Takegami et al., 2005). Our results are similar to Takegami’s, as younger expectant mothers perceive stronger sleepiness. In addition, mothers who have stronger daytime dysfunction have stronger perceived stress. Expectant mothers who perceive higher levels of stress feel stronger daytime sleepiness, a result similar to that reported in a study of the general population (Kaneita et al., 2005). Until now, researchers have observed the relationship of daytime sleepiness to snoring and diseases such as SDB and PIH (Franklin et al., 2000; Leng et al., 2006). On the other hand, Izci et al.,
(2005) has pointed out that there may be other more significant influences on sleepiness during pregnancy. We can say that further investigation into factors related to sleepiness is necessary.

There are many self-care interventions available to expectant mothers such as intentionally retiring early and establishing a specific time period for rest in bed. Having made clear first trimester sleep architecture, we hope this research has provided evidence that will be useful in improving methods of self-care for expectant mothers, and ultimately improve their quality of life.

In conclusion, this study has shown that, when compared to same age women in the general population, markedly more first trimester expectant mothers have poor sleep quality, 65.2% exceeded the cut-off score; and have markedly higher ESS scores, 50.0% were regarded as having EDS. Expectant mothers who have high PSQI scores have significantly higher PSS scores which indicate the degree of perceived stress. Moreover, expectant mothers who retire to bed at consistent times most days have lower PSQI scores. In addition, primipara perceive higher levels of daytime sleepiness than multipara, and the more children multipara have the lower is their perceived level of sleepiness. There was no significant difference in duration of sleepiness and parity, or nap time and parity. For the attribute of employed or not employed, there was a significant difference for nap time, but no significant difference for sleepiness duration.

Acknowledgements

We would like to sincerely thank the doctors, nursing directors, nursing staff of Kouseiren Hiroshima Hospital and Masaoka Hospital, and participants for their cooperation in this research. We would also like to thank Roger L. Reinoos for his assistance in translating this article.

References


妊娠初期の睡眠の質と眠気の特徴

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抄録

目的
睡眠は正常な妊娠経過や胎児の発育にとって重要である。そのため、妊娠初期の妊娠に適切なセルフケアのための知識や助言を提供することが必要である。そこで、本研究は妊娠初期の睡眠や眠気のパターンを明らかにすることを目的とする。また、それらとストレスなどの要因との関係を明らかにすることを目的とする。

方法
広島県内の2病院の産婦人科外来で妊娠健康診査を受けている妊娠46名から自記式質問紙を回収した。調査期間は2007年4月から2008年1月までである。質問紙は、ビッツバーグ睡眠調査票（PSQI）、エップワース眠気尺度（ESS）、睡眠日誌、及び自覚されたストレス尺度より構成した。

結果
PSQI合計得点（PSQIG）は平均6.67（±3.20）であり、65.2％の妊娠がCut off値以上であった。PSQIGはストレスの高い妊娠で有意に高かった（r = 0.38, n = 46, p < 0.01）。PSQIGと就床時刻の規則性には有意な正の相関があり（r = 0.40, n = 46, p < 0.01），規則正しく就床している者ではPSQIG得点が低くなっていった。平均ESS得点は10.1（±4.3）で、50％の妊娠が11点以上であった。また、ESS得点は経産婦よりも初産婦で高くなる（un-paired t (44) = 2.52, p < 0.05），子どもの人数が多いほど得点が低かった（r = -0.32, n = 46, p < 0.05）。眠気時間や昼寝の長さは初経産別で差がなかった。仕事の有無により昼寝時間に差は見られたが（un-paired t (27) = 2.27, p < 0.05），眠気時間との間には差がなかった。

結論
本研究により、妊娠初期には同世代の一般女性と比べて、睡眠の質が悪い人や目中に過度の眠気を感じている人が著しく多いことが明らかとなった。また、睡眠の質はストレスのコントロールや、規則正しい就床により高めることができることが示唆された。

キーワード：睡眠の質，眠気，妊娠初期，ストレス