Sleeping Position, Dream Emotions, and Subjective Sleep Quality

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This study was aimed to examine the relationship between sleeping positions, dream characteristics, and subjective sleep quality in normal subjects. Sixty-three healthy subjects (45 males and 18 females) were included in the present study. Of these participants, 41 were grouped in right-side sleeping position and 22 subjects were in left-side sleeping position. The subjects were interviewed in terms of dream recall frequency, vividness, bizarreness, nightmare frequency, and dream emotions suggested by Hartmann et al. PSQI was also administered to the subjects. The rate of nightmare sufferers was significantly higher in left-side sleepers (40.9%) than in right-side sleepers (14.6%). Relief-safety was more common among right-side sleepers than the others. Global PSQI score were significantly lower in right-side sleepers than left-side sleepers. These findings suggest that dreaming and sleep quality may be affected by body posture. **(Sleep and Hypnosis 2004;6(1):8-13)**

Key words: *sleeping position, dreaming, dream emotion, nightmare, sleep quality, Pittsburgh Sleep Quality Index (PSQI), cognition*

INTRODUCTION

As stated by Lorrain and De Koninck (1), motor activity during sleep has always been of much interest in the study of sleep and if body motility is related to sleep cycle and sleep stages, it would be appear natural to expect that sleep positions would also be related to the electrophysiology of sleep. Dorsal positions are related not only to snoring and sleep apnea in adults (2-5), in infants (6-8), and in children (9) but also to poor sleep quality (10). On the other hand, the prone sleeping position has been identified in world-wide epidemiological studies as a major risk factor for sudden infant death syndrome (SIDS) (11). The pattern of early motor development is also affected by sleep position (12). For example, prone sleepers attain several motor milestones earlier than supine sleepers. Importantly, the effectiveness of oral appliance therapy is greatly influenced by sleep posture and sleep posture recorded by polysomnography may be useful to predict the future success or failure of the device (13).

In order to demonstrate the relationship between sleeping position and sleep electrophysiology, De Koninck et al. (14) recently recorded sleep positions and polysomnography in five age groups: 3-5, 8-12, 18-24, 35-45 and 65-80 years old. Subjects slept for four consecutive nights (except the 3-5 year olds who slept two nights) in the laboratory where standard polysomnography

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was recorded. On nights 3 and 4, sleep positions were recorded with a Super 8 Camera taking one frame every 8 seconds and were scored using four dimensions (head, trunk, legs and arms) each consisting of four categories. They found a ontogenetic decrease in the number of position shifts and more interestingly a significant progressive ontogenetic disappearance of prone positions. Whereas in children, prone, supine and lateral positions were assumed to occupy an equal proportion of sleep time, trend analyses revealed a significant progressive ontogenetic disappearance of prone positions and a progressive preference, very marked in the elderly, for right-side positions. In a consecutive study, Lorrain and De Koninck (1) found that the decrease with age in prone positions and the increase in right-side positions were present in all but stage 4, and were particularly clear within stage 2 and REM. These authors also suggested that the decrease in prone positions was likely attributable to the lack of flexibility in the latter ages of the spinal cord, and/or the extra effort required for breathing from the respiratory cage. This researchers (15) also speculated that the preference for the right side during sleep which appear to be characteristic of elderly persons may respectively be related to cardiovascular and respiratory functions.

Interestingly, poor sleepers were found to be spent more time awake and had more awakenings than good sleepers (10). Consistently, poor sleepers spent more time on their backs with their heads straight. These results suggest that sleep positions constitute an important sleep variable and that they may be related to the quality of sleep.

Despite earlier observations about relationship between sleeping positions, motor activity, and sleep stages, there is no data on body positions and dreaming. This study was aimed to examine the relationship between sleeping positions, dream characteristics, and subjective sleep quality in normal subjects.

MATERIALS AND METHODS

Subjects

Sixty-three healthy subjects (45 males and 18 females) were included in the present study. They ranged in age from 19 to 60 years (M=33.9; SD=8.4). All participants were healthy physically and neurologically. In initial screening, 129 subjects were interviewed face to face by two interviewers to include in the study. Those who had current or past any psychiatric disorders, alcohol or substance abuse, and sleep disorders were excluded. All of them were selected from among university lecturers. The study was described to the all subjects and written informed consent was obtained.

We used a semi-structured interview schedule to determine sleeping positions. At first, we questioned them about the usual body positions just before go to sleep, which position they found themselves just after awaking, and which position they exactly kept in bed during the night. We used a scale for all periods as always right-side, usually right-side, always left-side, usually left-side, always supine position, usually supine position, always prone position, usually prone position, mix and unknown positions. We considered only the subjects who described an exact sleeping position either as right- or left-sides. The subjects who reported supine, prone, mix, and unknown positions were not include in analysis. Only those who reported that they found themselves in the same body position (right or left side) both just before going to sleep and just after awaking, even during the night were included in the study. Those who were not sure which position they use during the night, just before going to sleep and just after awaking were not included in the study. Thus, 41 subjects were grouped in right-side sleeping position and 22 subjects were in left-side sleeping position.

Dream Characteristics

We interviewed with the subjects in terms of dream recall frequency, vividness, bizarreness, nightmare frequency, and dream emotions. All participants completed a dream diary including the last dream. We classified subjects as those who recall their dreams at least two nights per week (good recallers) and as those who recall less (poor recallers). With regard to vividness, we assessed participants` dreams either as vivid or not vivid. Bizarreness was assessed as more bizarre or as less bizarre. Subjects were also grouped as nightmare sufferers (at least two nightmares per week) and as those who never report nightmares during past two months.

A quantitative rating scale developed by Hartmann et al. (16) was used to examine dream emotions. Each of the dreams was assessed for contextualizing images (CIs) at least by one experienced scorer. The scorer is given the score sheet in which there is 18 emotions, and asked to examine each dream report and pick out a striking or powerful image if possible-specifically, "a striking, arresting or compelling image- not simply a story but an image which stands out by virtue of being especially powerful, vivid, bizarre, or detailed." If the scorer felt there was more than one emotion, he might score a second emotion as well. These emotions were fear-terror; helplessness, vulnerability, being trapped, being immobilized; anxiety, vigilance; guilt; grief, loss, sadness, abandonment, disappointment; despair; hopelessness (giving up); anger, frustration; disturbing-cognitive dissonance, disorientation, weirdness; shame, inadequacy; disgust, repulsion; power, mastery supremacy; awe, wonder, mystery; happiness, joy, excitement; hope; peace, restfulness; longing; relief, safety; and love (relationship).

Subjective Sleep Quality
Pittsburgh Sleep Quality Index (PSQI)

The PSQI is a standardized measure of sleep quality that has been widely used in sleep research developed by Buysse et al. (17). It consists of 19 items that produce a global sleep quality index (GSQI) and 7 component scores reflecting sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medications, and daytime dysfunction (range of subscale scores: 0–3). The sum of these seven component scores yields one global score of subjective sleep quality (range, 0–21); higher scores represent poorer subjective sleep quality. The psychometric properties of the PSQI were confirmed by pervious studies (17,18). The Turkish version had been translated from English into Turkish previously by us (19) and found to has reliability and validity as high as its original form.

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS), release 9 was used for data analyses. Fisher exact test and t test were used in statistical analysis.

RESULTS

Table 1 shows dream characteristics of the

Table 1. Dream characteristics of the subjects

	Right-side Subjects (N=41)		Left-side subjects (N=22)		
Dream variables	**N**	**%**	**N**	**%**	**p***
Good recall	28	68.3	15	68.2	ns
Vividness	30	73.2	14	63.6	ns
Bizarreness	8	19.5	6	27.3	ns
Nightmare suffering	6	14.6	9	40.9	.03

*Fisher exact test
ns:nonsignificant

subjects. There was no significant difference between the groups in dream recall frequency, vividness, bizarreness. The rate of nightmare sufferers was significantly higher in left-side sleepers than in right-side sleepers (40.9% vs. 14.6%).

Table 2 and Table 3 list the first and the second dream emotions in the subjects` dreams. As shown in Table 2, relief-safety was more common among right-side sleepers than left-side sleepers. There was no significant difference between the groups in other emotions. Although positive emotions were more common in right-side sleepers than the others, this difference was not statistically significant (Table 3).

Table 2. Dream emotion list (the first emotion)

	Right-side Subjects (N=41)		Left-side subjects (N=22)		
Dream emotions	**N**	**%**	**N**	**%**	**p***
fear-terror	8	19.5	5	22.7	ns
helplessness, vulnerability	1	2.5	3	13.6	ns
anxiety, vigilance	1	2.5	1	5	ns
guilt	0	0	0	0	ns
grief, loss	2	5	1	5	ns
despair, hopelessness (giving up)	0	0	1	5	ns
anger, frustration	3	7	3	15	ns
disturbing-cognitive dissonance	3	7	0	0	ns
shame, inadequacy	1	2.5	2	9.5	ns
disgust, repulsion	0	0	0	0	ns
power, mastery supremacy	1	2.5	2	9.5	ns
awe, wonder, mystery	2	5	3	15	ns
happiness, joy, excitement	2	5	3	15	ns
hope	1	2.5	0	0	ns
peace, restfulness	1	2.5	0	0	ns
longing	4	9.7	0	0	ns
relief, safety	9	22	0	0	.021
love (relationship)	1	2.5	0	0	ns

*Fisher exact test
ns: nonsignificant

Table 3. Dream emotion list (the second emotion)

	Right-side Subjects (N=41)		Left-side subjects (N=22)		
Dream emotions	**N**	**%**	**N**	**%**	**p***
fear-terror	0	0	2	9.5	ns
helplessness, vulnerability	1	2.5	1	5	ns
anxiety, vigilance	5	12.2	2	9.5	ns
guilt	0	0	2	9.5	ns
grief, loss	1	2.5	0	0	ns
despair, hopelessness (giving up)	4	9.7	1	5	ns
anger, frustration	0	0	1	5	ns
disturbing-cognitive dissonance	4	9.7	0	0	ns
shame, inadequacy	0	0	0	0	ns
disgust, repulsion	0	0	1	5	ns
power, mastery supremacy	0	0	0	0	ns
awe, wonder, mystery	4	9.7	1	5	ns
happiness, joy, excitement	7	17.1	3	15	ns
hope	9	22	2	9.5	ns
peace, restfulness	0	0	1	5	ns
longing	4	9.7	0	0	ns
relief, safety	2	5	4	20	ns
love (relationship)	0	0	1	5	ns

*Fisher exact test
ns: nonsignificant

Table 4. PSQI component and global scores of the subjects

	Right-side Subjects (N=41)	Left-side subjects (N=22)	t	p
sleep quality	.73±.67	1.13±.63	2.31	.024
sleep latency	.71±.87	1.1±.86	1.66	ns
sleep duration	.29±.60	.59±.73	1.73	ns
habitual sleep efficiency	.21±.30	.36±.72	2.05	.045
sleep disturbance	.93±.61	1.14±.47	1.41	ns
use of sleeping medications	.21±.26	.22±.21	.42	ns
daytime dysfunction	.58±.74	1±.87	1.99	.05
Total score	3.39±2.69	5.36±2.83	2.72	.008

ns: nonsignificant

Table 4 shows PSQI component and global scores of the subjects. Sleep quality, habitual sleep efficacy, daytime dysfunction, and global PSQI scores were significantly lower in right-side sleepers than left-side sleepers. Thus, right-side sleepers had better subjective sleep quality than the others.

DISCUSSION

In the present study, we examined the association between sleeping positions, dream variables and sleep quality. We found that nightmares were more common in left-side sleepers. Our findings also suggested that positive emotions such as happiness, joy, excitement; hope; peace, restfulness; longing; relief, safety; and love were common among right-side sleepers. Although some observations about relationship between sleep positions, motor activity, and sleep stages had been performed previously (1,15), this is the first study examining the relationship of sleeping positions with dream emotions. In addition, we found that right-side sleepers had better subjective sleep quality than left-side sleepers. These results together with De Konick et al.` results (10) suggest that sleeping positions constitute an important sleep variable and that they may be related to the quality of sleep.

There are a few limitations in the present study. First, our sample relatively included small number of subjects. This study represents a preliminary study. Thus, it is not clear yet whether other sleeping positions such as supine and prone affect dream variables. Second, these results come from self-reports and are not confirmed by objective indicators such as video-photographic recordings or polysomnography. We plan an electrophysiological dream-sleeping position study in normal healthy subjects as well as depressed patients.

What is the meaning of the present findings? Unfortunately there is no data on dream characteristics and sleeping positions in the literature. Cheyne (20) examined situational factors affecting sleep paralysis and associated hallucinations, position and timing effects in two studies involving 6730 subjects. These studies reported that a greater number of individuals reported sleep paralysis in the supine position than all other positions combined. The supine position was also 3–4 times more common during sleep paralysis than when normally falling asleep. The supine position during sleep paralysis was reported to be more prevalent at the middle and end of sleep than at the beginning suggesting that the sleep paralysis episodes at the later times might arise from brief microarousals during REM, possibly induced by apnea. Modest effects were found for sleep paralysis timing, but not body position, and the reported intensity of hallucinations and fear during sleep paralysis. According to that Cheyne`s results body position appeared to affect both the incidence and, to a lesser extent, the quality of the sleep paralysis experience. An other study (21) also showed that the sleep paralysis as occurring predominantly in the

supine position regarding REM sleep. They concluded that in narcoleptic patients sleep-related hallucinations and sleep paralysis occurred predominantly in the supine position.

As a conclusion, it is clear that right-side sleepers in the present study had good sleep quality as well as positive dream emotions. Left-side sleepers reported more nightmares compared to right-side sleepers. Our preliminary observations indicate that dreaming and sleep quality are associated with underlying brain functions and may be affected by body posture. It will be of interest to determine whether the patients with dreaming disturbances such as depressive disorder, nightmare disorder, and narcolepsy are able to limit symptoms. Future research also needs to show how individuals who are skilful in controlling their dreams by hypnotic manipulations or lucid dreaming change their dream process by intentionally changing their posture.

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