

Unpleasant Dream Content and Risk of Sleep Apnea

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Abstract

Objective: The aim of this study was assess the association between risk of sleep apnea and reported unpleasant dream content in healthy individual.

Methods: In this prospective study, participants completed Berlin questionnaire (BQ) to assess their risk for sleep apnea and also, completed a self-report questionnaire that assessed unpleasant dream experiences over the past month including frequency of recalled dreams. Based on BQ finding, participants divided in two groups (low and high risk for sleep apnea) and unpleasant dream content were compared between two groups.

Results: four hundred forty eight participants completed questionnaires. 72 subjects (16%) were diagnosed as high risk for sleep apnea, and 376 (84%) were recognized as low risk. There were no significant differences on items related to the frequency of each unpleasant dream between two groups. Also, 32% of low risk subjects reported infrequent dream recall and 25% reported frequent dream recall. Whereas in high risk group, 30% subjects reported infrequent and 30% reported frequent dream recall. There were no significant differences on any of the general measures of dream recall.

Conclusion: This study provides no evidence of an association between frequency of unpleasant dream and risk of sleep apnea. Light sleep, high arousal frequency and impaired short term memory might affect reported dream content as well as dream recall frequency.

Keywords: Sleep apnea; Unpleasant dream content; Dream recall

Introduction

Dream is described as mental activity which happens during sleep [1]. It have been demonstrated that dreams reflect waking-life experiences such as visual or auditory perceptions, emotions and stress [2,3]. It is necessary to notice that dream itself cannot be evaluated straightly and the only available base is the dream report recalled by the person upon awakening.

Dreaming process may be affected by the sleep disorders [3]. Additionally, dream recall frequency has been related to sleep parameters such as rapid eye movement (REM) sleep physiology, frequency of nocturnal awakenings and sleep duration [3,4]. However, it's unclear that whether the presence of a sleep disorder like sleep apnea could affect dream content and recall.

Despite the several studies assessed some sleep problems such as insomnia and sleep apnea [5-8], most of them focused only on frequency of nightmare and dream recall; and dream content in sleep disorders is not clearly investigated.

The studies on the correlation between the sleep apnea and unpleasant dream were generally based on retrospective ascertainment of nightmare frequency, and there are controversies in their finding. Since, some small sample size studies reported that patients with obstructive sleep apnea (OSA) have negative emotional tone in dreams and dream emotion decreased with increasing apnea-hypopnea index (AHI) [9-12], others failed to confirm this and reported that

nightmare frequency declines with Increasing AHI [6]. Because of disagreement between studies and lack of sufficient investigations on the study of risk of sleep apnea and unpleasant dream content, in this study we attempt to assess the relationship between risk of sleep apnea and unpleasant dream content in a large sample population.

Methods

During four months study period (September to December 2013), participants with ages between 20-65 years were selected using convenience sampling from Kermanshah in western Iran. Samples were selected from different areas of the city including offices, households and public places. The study was approved by the ethical committee of Kermanshah University of Medical Sciences and informed consent was obtained from all the participants. A brief screening with each individual with conversation of two expert psychologists who were responsible for data collection, showed no evidence of present or previous psychiatric disturbance in the subjects. Exclusion criteria were history of substance abuse, the presence of cardiovascular, respiratory, psychiatry, neurological and pregnancy. Also, participants with previous diagnosed sleep disorders (e.g., insomnia, periodic limb movement and sleep apnea) were excluded from the study. To evaluate the correlation between risk of sleep apnea and unpleasant dream content, at first, participants completed Berlin questionnaire (BQ) to assess their risk for sleep apnea. The BQ is a simple and useful screening tool for the prediction of sleep apnea risk in general population [13,14]. The BQ has 3 sections: In the first section, participants are asked to score their snoring. In section 2

daytime fatigue and sleepiness during day activities are asked; and in the last section, history of hypertension is asked and height and weight measured to calculate body mass index (BMI). The first two sections are assumed to be positive if the total score was two or more. If subject has hypertension or a BMI > 30 kg/m², section 3 can be considered as positive. In general, if there are two or more sections with positive scores, this subject is categorized as "high risk" for sleep apnea. In the present study, we used their Persian version of BQ which was used and validated by Amra et al., with the sensitivity, specificity, positive and negative predictive values of 84.0%, 61.5%, 96.0%, 25.8%, respectively [14].

To evaluate unpleasant dream content participants completed a 14-item self-report questionnaire that assessed unpleasant dream experiences over the past month. Also, an eight-point scale ranging from 0 (never) to 7 (several times at night) used for participants to report on the overall frequency of recalled dreams.

Reported dream recall were classified as infrequent when reported at less than once a month, or frequent when reported at a frequency greater than once per week.

Statistical analysis was carried out with the SPSS version 19 (SPSS Inc., Chicago, IL, USA). After descriptive analyses, independent-sample t-test for quantitative variables and chi-square test for qualitative variables used for data analysis. P-values less than 0.05 were considered as a statistically significant level.

Results

From a total of 498 participants, 448 (mean age of 30.6 ± 10.9, male: 224) completed the questionnaires. Fifty were dropped from the analysis because of incomplete data. After assessment of BQ by two psychologists who were blind from the study, 72 subjects (16%) were diagnosed as definite cases of high risk for sleep apnea, and 376 (84%) were recognized as low risk for sleep apnea. So, we analyzed data regarding to the high and low risk for sleep apnea. Demographic characteristics are shown in Table 1. As shown in this table, risk factors of sleep apnea (male gender and high BMI, neck and waist circumference) were significantly higher in high risk patients than low risks.

	High risk (n=72)	Low risk (n=376)	p value
Age (year)	31.6 ± 13.8	29.3 ± 9.7	0.094
Gender (male)	43 (59)	181 (48)	0.012
Body mass index (kg/m ²)	25 ± 6.6	22.8 ± 5.6	0.004
Neck circumference (cm)	37.8 ± 7.9	35.2 ± 9.2	0.041
Waist circumference (cm)	89 ± 13.3	81.4 ± 13.1	<0.0001

Table 1: Demographic characteristics in study participants. Data presented as mean ± SD or number (%).

Table 2 shows the responses obtained from both groups to the self-report questionnaire about unpleasant dream content. Results of 14-item self-report questionnaire showed that there were no significant differences on items related to the frequency of each unpleasant dream. Also, there were no significant differences on any of the general measures of dream recall. One hundred twenty subjects (32%) in low risk group reported less than once a month dream recall

(infrequent) and ninety five subjects (25%) reported greater than once per week (frequent), whereas in high risk group, 22 subjects (30%) reported infrequent dream recall and 22 subjects (30%) reported frequent dream recall (p=0.48).

	High risk (n=72)	Low risk (n=376)	p value
Being chased or pursued	20 (27%)	79 (21%)	0.205
Falling	27 (37%)	121 (32%)	0.371
Being killed	19 (26%)	75 (20%)	0.219
A person who is alive being dead	26 (36%)	140 (37%)	0.947
Killing someone	12 (16%)	43 (11%)	0.212
Wild, violent beasts	20 (27%)	141 (37%)	0.119
Being half awake and paralyzed	17 (23%)	86 (22%)	0.835
Being smothered, unable to breathe	19 (26%)	74 (19%)	0.191
Scary events (earthquakes, floods, explosions, fires, ...)	19 (26%)	87 (23%)	0.544
Trapped in a tight or enclosed space	18 (25%)	87 (23%)	0.741
Drowning or suffocation	15 (20%)	66 (17%)	0.508
Bizarre elements	18 (25%)	80 (21%)	0.491
Aggression and violence	21 (29%)	81 (21%)	0.154
Frequent awakening from sleep due to very frightening dreams that cause significant distress or interfere with your performance	20 (27%)	97 (25%)	0.735

Table 2: Reported unpleasant dreams in study participants. Data presented as number (%) and p values are from the chi square test for these categorical variables.

Discussion

In this study we investigated the relationship between risk of sleep apnea and unpleasant dream content in a large sample population. At the time of dream reporting, neither researcher nor subjects knew the medical sleep diagnosis for risk for sleep apnea. This is the most advantage of our study because, recent medical diagnosis for patient can affect mood or dream content.

There are many studies on the effect of external stimulants on dream content [3]. However; there are infrequent investigations on the effect of internal stimulants. Taking this idea that internal stimulants can affect dream content, it seems that sleep apnea which can affect many physiological processes, can also affect dream content. But, studies that carried out on the effects of sleep apnea on dream content are rare and yielded mixed results. Our finding shows that frequency of unpleasant dream in subjects who had high risk for sleep apnea were similar to normal control subjects. Despite a number of patients

with high risk for sleep apnea reported unpleasant dreams, but a general effect of sleep apnea on unpleasant dream content has not been observed.

One mechanism to justification of this finding is that cognitive dysfunctions and attention deficit in people with sleep-related breathing disorders might affect reported dream [15,16]. It is demonstrated that there are strong association between dream length and verbal short-term memory in healthy elderly persons [3]. It seems that memory dysfunction might affect the processing of dream recall upon awakening. One other believable mechanism is that the mind adapts to the slow progress of apnea severity over the years. Surprisingly, it is suggested that it is necessary to conduct a study where participants wear a device which allows blocking the breathing completely to assess the effect of new apnea on dream content [3].

In a study by Schredl et al., correlation between respiratory disturbance indices (RDI) with different dream characteristics was investigated. They found a strong association between high RDI with more realistic and less bizarre dreams. The authors concluded that micro-arousals terminating breathing pauses might interfere with the dreaming process [11].

Fisher et al in a study on forty-seven patients with sleepiness and snoring which based on AHI grouped as AHI < 5, AHI 5 -14.9, and AHI ≥ 15, found an increase in dream unpleasantness with increasing AHI. The AHI ≥ 15 group had significantly more negative emotionally dreams than the AHI < 5 group (12). Also, previously, Carrasco et al, reported negative dream in sleep apnea patients (10). However, these studies appear to opposite to the findings of Pagel and Kwiatkowski that showed a decrease in percentage of patients with frequent recall of nightmares across their four AHI groups: 71.4% of those with AHI < 5 had frequent nightmares compared to 20.6% of those with AHI ≥ 30. They concluded that depressed nightmare recall may due to the REMS suppression in OSA patients [6].

Another explanation of this variety in dream emotional tone among patients with sleep apnea could be that the sleep of these patients is so fragmented that it interferes with the dream processing and can barricade dream emotion to develop. This may be due to the high sleep apnea severity can disturbed sleep architecture [17,18].

Additionally, Merritt et al reported appearance of positive emotions in the first quartile and appearance of negative emotions in the last two quartiles of the dream. They suggested that dream emotions tend to go "from bad to worse." [19]. It is possible that fragmented sleep in patients with sleep apnea is insufficient to consolidate sleep for dreams to go from bad to worse. So, dreams remain neutrally toned.

Regarding dream recall frequency in patients with sleep apnea, there are controversies about studies using a dream frequency scale. Studies showed that dream recall frequency in patients with sleep apnea, may be lower, higher or equal compared to that of control healthy subjects. Whereas Schredl et al. did not find any differences regarding to dream recall frequency in sleep apnea patients and control [20], in another study, this author reported that dream recall frequency in 323 patients with sleep apnea was lower than healthy controls [21]. In the third study [11] reported an increased dream recall frequency in forty-four sleep apnea patients.

Studies suggested two conflicted mechanisms which might affect dream recall frequency. First, light sleep and high arousal frequency might increase dream recall and, on the other hand, impaired

cognitive functions which is common in patients with sleep apnea might impair dream recall [10,15,16].

We found no difference in reported unpleasant dreams between high and low risk subjects for sleep apnea. However, given the relatively low frequency of high risk subjects in our population (16%), the possibility of a type II error must be considered. Because of this low frequency, the application of the statistical analyses may be limited. Studies involving larger numbers of high risk patients are necessary to further clarify the relationship between unpleasant dreams and risk for sleep apnea. But our results are noteworthy, unless they are disproved.

In conclusion, this study shows that there is no association between frequency of unpleasant dream, dream recall and risk of sleep apnea. Light sleep, high arousal frequency and impaired short term memory might affect reported dream content as well as dream recall frequency.

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