Sleep Science

ORIGINAL ARTICLE

The effect of eye mask on sleep quality in patients of coronary care unit

O efeito da mascara de olhos na qualidade de sono em pacientes em uma unidade coronariana

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ABSTRACT

Objectives: Patients in coronary care unit (CCU) are at risk of sleep deprivation. This study investigated effects of eye mask on sleep quality in patients of CCU in Southeast of Iran by a cross-over design. **Methods:** Using Verran and Snyder-Halpern Sleep Scale (VSH Sleep Scale), quality sleep of 60 patients with and without usage of eye mask were evaluated. This tool consists of 16 items that includes three main sleep sub scales: disturbance, effectiveness, and supplementation. **Results:** In total, 34, 22 and 4 out of 60 patients were admitted to CCU due to myocardial infarction (MI), chest pain and angina pectoris, respectively. Mean time of patients' nocturnal sleep was 6.6 ± 1.1 hours. Using eye mask have statistically significant increased the quality of sleep in subscales disturbance and effectiveness ($p < 0.05$). **Conclusion:** In general, the use of eye mask is an easy and cheap method to improve the quality of sleep in CCU patients.

Keywords: heart diseases, sleep, sleep deprivation.

RESUMO

Objetivos: Pacientes em Unidade Coronariana (UCO) apresentam maior risco de privação do sono. Este estudo investigou os efeitos do uso da máscara de olho na qualidade do sono em pacientes do UCO no sudeste do Irã, com um desenho de estudo transversal. **Métodos:** Usando Verran e Snyder-Halpern Scale Sleep (VSH Escala do sono), sono de 60 pacientes com e sem o uso de máscara de olho a qualidade foram avaliada. Esta ferramenta é composta por 16 itens, que inclui três principais sub-escalas do sono: perturbação, eficácia e suplementação. **Resultados:** No total, 34, 22 e 4 de 60 pacientes foram internados em UCO devido ao infarto do miocárdio (MI), dor no peito e angina respectivamente. O tempo médio de sono noturno dos pacientes foi de 6,6 ± 1,1 horas. Os pacientes que usaram máscara de olho apresentaram estatisticamente significativa aumentou a qualidade do sono nas sub-escalas de perturbação e eficácia ($p < 0,05$). **Conclusão:** Em geral, a utilização de máscara para os olhos é um método fácil e barato, para melhorar a qualidade do sono em pacientes UCO.

Descritores: cardiopatias, privação do sono, sono.

INTRODUCTION

Sleep composes one third of human life and is an essential part of the normal human circadian rhythm[1,2]. Good sleep could reduce stress and anxiety which it may help the person by a restorative process, increase focus attention, consistency and enjoyment of daily activities[3]. Although the function of sleep is not clear, it is generally accepted that lack of sleep could affect on the health of patients and may tend to a recovery from illness[4-7]. In general, hospitalization can affect patients' quality of sleep[7,8]. It can be related to environmental, physiological and psychological factors[6,9]. Acutely, ill patients are at higher risk of sleep disruption[3,10,11], especially critically ill patients in coronary care unit (CCU)[3,12]. Many forms of sleep deficit can occur in patients who admitted to CCU; including decrease duration of sleep, difficulty in falling asleep, and difficulty maintaining sleep during the night[3].

In critical care setting, two main causes of sleep deprivation are noise and inappropriate use of light/dark cycles[10]. Although most sleep disorders in CCU patients could be treated by using pharmacological methods[3,12,13]; however, non-pharmacological methods still remain important and less expensive way for increasing quality of sleep in hospitalized CCU patients[3,12]. The effectiveness rate of these therapeutic methods has been reported 70 to 80%[13]. Moeini et al.[12], in 2012, studied the effects of aromatherapy on the quality of sleep in CCU patients. They reported that quality of nocturnal sleep in patients with ischemic heart disease could improve after aromatherapy with lavender oil. In the study of Hu et al.[14], the effects of earplugs and eye masks on nocturnal sleep, level of urine melatonin and cortisol in healthy subjects exposed to simulated intensive care unit environment were evaluated. They reported that the use of earplugs and eye masks may increase

rapid eye movement (REM) time, decrease REM latency, less arousal and elevate level of melatonin in urine. They also reported that for patients, the use of eye mask is more comfortable than earplug[14]. In 2010, Neyse et al.[3] surveyed the effect of earplug on the quality of sleep in sixty patients with acute coronary syndrome whom were admitted in CCU. They reported that the use of earplug resulted improvement in the quality of sleep in this group of patients. They also reported that use of earplug by CCU patients has decreased consumption of sleeping medications and increased the morning function.

Furthermore, sleep deficit may increase activity of sympathetic system which in turn could result in increased heart rate, blood pressure, myocardial oxygen demand, pain, anxiety, irritability and nervousness in patients with heart diseases[3,12]. Health care team members should pay more attention to patients' sleep in CCU. In this regard, the use of non-pharmacologic interventions such as eye mask is a cheap and easy method[3]. Despite the emphasis on the use of non-pharmacologic methods for improving patients' sleep quality in CCU, few studies have been performed in this area. The purpose of this study was to evaluate the effects of eye mask on sleep quality in CCU patients in Southeast of Iran.

MATERIAL AND METHODS

The study was conducted during the period of July to October 2012 in Jiroft Hospital in Southeast of Iran. Ethical approval was obtained from the research ethical centre of the Kerman Medical University. A cross-over design was performed. The sample composed of 60 patients who were admitted in CCU. This unit has 8 beds in 8 separated rooms. According to hospital protocol, at 22:30 every night, all lights were turned off for helping patients to have a better sleep. A "night's sleep" is considered as the period from when the person tried to sleep until waking up in the morning[15].
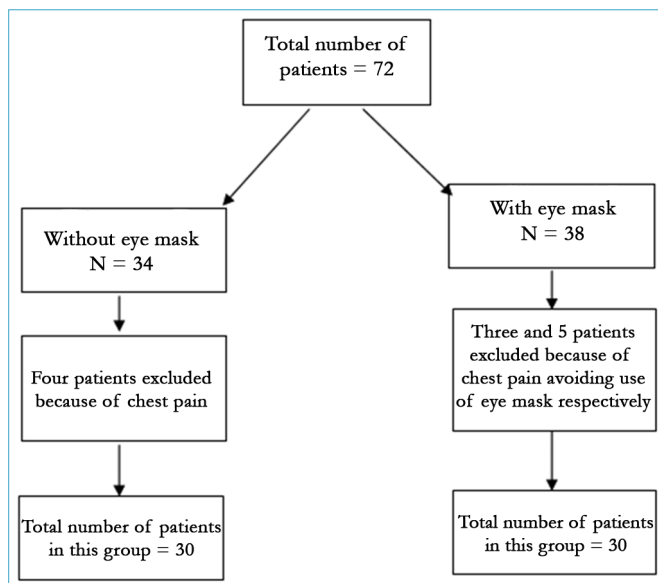
Written consent was obtained from each participant. Before obtaining the patients' consent, the research was comprehensively described to each patient, and they were assured that their information will be used only for research purposes. Inclusion criteria of the study were: aged more than 18 years old, being alert enough to response the questionnaire, have stable hemodynamic situation, no history of vision's disorders, and not used previous eye mask at sleep time. Patients with previous sleep disorder (acute or chronic), patients with history of mental disorder and patients who used narcotics, sedative, psychiatric and analgesic drugs were excluded. In time of CCU admission the eligible patients were randomly assigned to two groups (group eye mask (group 1) or without eye mask (group 2) by the supervisor of the CCU, who chose the next serially numbered sealed opaque envelope containing a simple 1:1 randomization sequence. Patients in group1 used eye mask in sleeping time in first night after admission to CCU and patients in group 2 slept without eye mask at first night after. In second night patients groups changed. Sampling continued to sample number reached to 60 patients. Patients' room and beds were similar in both nights for every patient. Correct use of eye mask by patients was controlled by researchers working in CCU.

Data collection tools in this study were Verran and Snyder-Halpern Sleep Scale (VSH Sleep Scale). Using this questionnaire, patients provided an assessment of the quality of their previous night's sleep. This tool consists of 16 items which includes three main sleep sub scales: "disturbance" (interruptions and delays in sleep), "effectiveness" (how well sleep-refreshed the individual), and "supplementation" (napping). Disturbance comprises items measuring subscales of fragmentation (interruption of sleep) and "latency" (delay in getting to sleep). Effectiveness comprises the subscales of "quality" (restfulness and depth of sleep), and "length" (hours of sleep while in bed). Supplementation contains four items about naps and falling back asleep after morning awakenings. Each characteristic is measured using a 100 mm visual analogue scale and the total score for the primary outcome of sleep disturbance is a sum of the scores from each scale (total score maximum 700). A lower total score on this scale indicates a lower degree of sleep disturbance. For effectiveness, higher scores indicate better sleep[15-18]. In order to translate the English version of VAS into Farsi, the standard forward-backward procedure was applied. Translation of the items and the response categories was independently performed by six professional translators and then temporary versions were provided. Later, they were back translated into English and after a careful cultural adaptation, the final versions were provided. The validity of questioner has been assessed through a content validity discussion. Scholars of statistics, physicians and nurses have reviewed the content of the questioner. To reassess the reliability of translated questioner alpha coefficients of internal consistency. The alpha coefficient for questionnaire was 0.91. Data were analyzed with use of descriptive statistics (mean and standard deviation (SD), Chi squared test and paired *t*-test. All statistical analyses were performed using SPSS software (v15.0; PASW Statistics). A *p* value of less than 0.05 was considered as statistically significant.

RESULTS

Of 72 patients who surveyed to achieving sample size of 60, 7 and 5 patient were excluded because of needs to morphine for relieving pain and avoiding use of eye mask respectively (Flow Chart 1). Of the 60 patients, 34 were men. The mean age of patients was 58 ± 11.8 years. Of the 60 patient, 34, 22 and 4 were admitted to CCU due to myocardial infarction (MI), chest pain and angina pectoris, respectively. In first time, mean time of nocturnal sleep, in patients in group 1 (group eye mask) and patients in group 2 (without eye mask) were 6.3 ± 1.1 and 5.4 ± 1.9 hour respectively. In second night, mean time of nocturnal sleep, in patients in group 1 (group eye mask) and patients in group 2 (without eye mask) were 6.4 ± 1.5 and 5.2 ± 1.8 hour respectively. Mean score of sub scale "disturbance" before and after intervention was 140.90 ± 55.6 and 89.83 ± 52.1 respectively. In this sub scale, most change before and after use of eye mask was related to item "wake after sleep onset". In sub scale "effectiveness", mean score of sleep quality was 255.33 ± 41.1 before intervention and 291.50 ± 38.9 after

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intervention. In this sub scale, most change before and after use of eye mask was related to item "sleep sufficiency evaluation". Results of paired *t*-test showed significant difference in mean score of sub scales "effectiveness" and "disturbance" before and after use of eye mask ($p < 0.05$). Mean score of sub scale "supplementation" before and after intervention was 25.50 ± 27 and 40.80 ± 23.4 respectively. In this sub scale, most change before and after use of eye mask was related to item "wake after final arousal (early morning awake)".

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                    Total number of
                     patients = 72

   Without eye mask                With eye mask
      N = 34                         N = 38

                                 Three and 5 patients
   Four patients excluded        excluded because of
   because of chest pain         chest pain avoiding use
                                 of eye mask respectively

  Total number of patients       Total number of patients
     in this group = 30             in this group = 30
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Flow chart 1: Patient's assignment to groups.

Results of paired *t*-test did not show any significant difference in sub scale of "supplementation" before and after use of eye mask ($p > 0.05$). Mean scores of three sub scale have been shown in details in Table 1.

DISCUSSION

The study was conducted in order to evaluate the effects of eye mask on the quality of sleep in CCU patients. Our results showed that in general, quality of sleep significantly improved after use of eye mask in this group of patients. In fact, hospitalized patients might experience a reduction in the amount and quality of sleep[3]. Admission to hospital may severely disrupt sleep, which can worsen pain, cardio-respiratory status, and the psychiatric health of acutely ill patients[3,12,13,19].

Quality of sleep in hospitalized patients should be a routine part of patients' assessment such as vital sign, because the patients sleep quality may reveal more information about patients' overall well-being[19]. One important group of patients whom may have higher risk of sleep disturbance is the patients with heart diseases[20]. Erikson et al.[21] studied the symptoms of sleep disturbances in patients with heart failure. They reported that 56% patients have trouble sleeping and one-third of them had used help sleeping medications. They also reported that inability to sleep flat (51%), restless sleep (44%), trouble falling asleep (40%), and awakening early (39%) are the most common problems in patients with heart failure. Similar to Erikson et al.[21], results of Zeighami et al.[22], in 2013, showed that patients whom suffer from heart disease, may have many problems in sleeping. Two most common sleep problems reported by Zeighami et al. were insomnia and sleep apnea. They also reported that factors such as weight loss, smoking cessation, control and treatment of chronic diseases and control of drugs side effects could decrease sleep problems in this group of patients.

High level of light and sound may considerably affect the quality of patients' sleep[23]. Zolfaghari et al.[24], in 2013, investigated the effects of environmental modification on quality of sleep among CCU patients. They reported that interventions of decreasing excessive environmental light and noise; such as

Table 1. Mean score of three sub scale of VSH before and after intervention.

Sub scale	Items	Mean score before intervention	Mean score after intervention	*p* value
	Mid-sleep awakening	19.67 ± 7.30	13 ± 7.14	0.006
	Wake after sleep onset	25.17 ± 9.84	14.33 ± 10.56	0.001
	Movement during sleep	19.83 ± 10.46	13 ± 7.14	0.005
Disturbance	Soundness of sleep	63.17 ± 15.79	41.33 ± 16.23	0.527
	Quality of disturbance	24.83 ± 13.48	16.83 ± 12.35	0.679
	Sleep latency	20.33 ± 8.89	14.33 ± 10.40	0.062
	Quality of latency	22 ± 10.87	14.50 ± 7.35	0.001
	Rest upon awakening	53.17 ± 12.35	66 ± 12.41	0.001
	Subjective quality of sleep	55.17 ± 11.48	65.67 ± 14.95	0.001
Effectiveness	Sleep sufficiency evaluation	31.07 ± 18.32	18.33 ± 14.34	0.001
	Total sleep time	51.17 ± 13.87	64.33 ± 9.97	0.002
	Total sleep period	38.17 ± 11.86	39.33 ± 10.36	0.001
	Daytime sleep	7.83 ± 9.34	8.83 ± 11.11	0.625
	Morning sleep	5.17 ± 5.18	4.57 ± 5.99	0.682
Supplementation	Afternoon sleep	12.50 ± 7.85	11.50 ± 7.32	0.625
	Wake after final arousal	64.33 ± 21.24	27 ± 18.69	0.005

turning off of extra lights, use of bulbs with low light, decreasing the alarm sounds level throughout the night, decreasing level of telephone ringtone during night and educating staff regarding the control of environmental excessive light and noise have improved the patient's nocturnal sleep in CCU. In 2007, Richardson et al.[10] surveyed the effects of earplug and eye mask on patients sleep in critical care unit with use of patient-rating scales. Similar to our finding, Richardson et al. reported that the use of earplug and eye mask could improve patients' sleep in critical care unit. Hu et al.[14] in 2010 studied the effects of earplug and eye mask on sleep of healthy subjects exposed to simulated intensive care unit (ICU) noise and light with use of polysomnography (PSG). Hu et al.[14] reported that exposing to simulated ICU environment causes decreasing in sleep quality, increasing light sleep, increasing REM latency, and decreasing REM sleep. They also reported that use of earplugs and eye masks may increase REM sleep and decrease REM latency and fewer arousals. In agreement with our finding, Moeini et al.[12] reported that use of non-pharmacological methods could improve patients sleep quality in CCU. They reported that the use of aromatherapy with lavender oil increase quality of sleep in patients who admitted to CCU. Jones & Dawson[25], in 2012, surveyed the effects of eye mask and earplug on CCU patients. Similar to our finding, Jones & Dawson reported that the use of simple interventions such as eye masks and earplugs could improve the sleep quality in critical care area. In Jones & Dawson study, participants reported that eye masks (28%) improved their sleep in CCU.

Healing cannot occur without nighttime lighting and a good night's sleep[26] sleep deficit and sleep without a refreshing and restorative function may increase the risk of recurrent events in patients with heart diseases[27]. Members of health care team especially nurses should pay more attention to satisfy the need of rest and sleep for CCU patients[3]. Nurses should assess patient sleep patterns routinely during hospitalization and then evaluate the need for sleep promotion strategies[28]. Results of present study confirmed that quality of nocturnal sleep in CCU patients was significantly improved after using of eye mask. Therefore, using eye mask at night time is a cheap and comfortable method, which could be recommended, for improving the quality of sleep in CCU patients.

Limitation

For measuring patients sleep time we used patients self reports. This limitation should be considered in the time of results use and interpretation.

CONFLICT OF INTEREST

Nothing to declare.

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