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The Effect of Acupressure on Quality of Sleep in Hemodialysis Patients

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Sleep disorders are the most prevalent complaints in hemodialysis patients. Treatments such as Air Way Positive Pressure and medicines frequently are not available or may have side effects. Acupressure is a non-invasive method from traditional Chinese medicine. The effectiveness of this method in treatment of sleep disorders has been proved in some studies. The aim of this study is to research the effect of Acupressure on quality of sleep in hemodialysis patients. This study was a randomized clinical trial; conducted at Razi hospital on a sample of 62 hemodialysis patients who had complains from sleep disorders. The sample were randomized into experimental and control groups. The experimental group received acupressure 3 times per week while undergoing dialysis for 4 weeks. The control group only received unit routine care. Quality of life was measured using Pittsburgh Sleep Quality Index (PSQI) before and after intervention. In order to record the pattern of quality of sleep the sleep log were used. Statistical analysis was done by Chi-square, T-test, Mann-Withney and Wilcoxon test. Findings on quality of life showed statistically significant differences between experimental and control groups based on PSQI. Domain of subjective quality of life ($p = 0.042$), time needed to falling sleep ($p = 0.007$), sleep duration ($p = 0.017$), habitual sleep efficiency ($p = 0.001$), sleep disorders ($p = 0.024$), daily performance disorders ($p = 0.002$) and overall score ($p = 0.001$) were improved in experimental group compared to control group. Moreover, sleep log demonstrated the decrease in nighttime waking and increase in quality of sleep that started from the first week of intervention and continued up to one week after intervention. This study confirmed the previously published studies which showed the effect of acupressure on improving the quality of sleep in hemodialysis patients. This treatment could be used as a non-invasive method for treatment of sleep disorders in these patients.

Key word: Sleep disorders, renal dialysis, acupressure, nursing care

INTRODUCTION

Together with progress in technology and treatment methods the life time of human being has increased and most of the diseases that were considered as deadly in past are now categorized as chronic in nature. Therefore, Chronic diseases are the most important problems in health caring systems (Timby, 2001). Chronic renal failure is one of these diseases that during the last five years increases by 8% per year. Every year in United States approximately 258000 patients undergo treatment due to this disease (Smeltzer and Bare, 2004). Although treatment by hemodialysis increases the life time patients but it cannot change the advancing of renal disease, So many of these patients are suffering from physical and mental-psychological problems (Hamissi and Hamissi, 2011). In many studies fatigue, depression and sleep disorders are reported as the most prevalent problems in these patients. For example 50-80% of these patients are suffering from sleep disorders (Tsaya and Chen, 2003). Burmann-Urbaneck *et al.* (1995) showed that 67% of hemodialysis patients suffer from sleep problems; 42% have a problem on falling sleep, 39% on remaining in sleep and 25 in both; 45% reported periods with hyperactivity with legs syndrome and 32% irritable legs syndrome; and during sleep 36% had snore and 19% had sleep Apnea syndrome Burmann-Urbaneck *et al.* (1995). Tsay *et al.* (2003) found that 50-80% of hemodialysis patients suffer from sleep disorders (Tsaya and Chen, 2003). Iliescu *et al.* (2003) indicated that 73% of hemodialysis patients have not good quality of sleep (Iliescu *et al.*, 2003). Pattern of sleep Disorders have influences on daily activities and cause disturbance in social behavior and finally lead to decrease in performance and quality of life in hemodialysis patients. Results of many studies have shown that hemodialysis patients with sleep disorders have a lower quality of life and more severe disease compare to the other patients (Iliescu *et al.*, 2003; Sanner *et al.*, 2002; Inonu and Kokturk, 2010). So, monitoring the sleep disorders in these patients must be seen as a emergent and successful treatments must be administered to promote the quality of their life (Burmann-Urbaneck *et al.*, 1995). Many treatments such as use of sleeping medications, positive air way pressure during sleep, bronchodilators etc are administered on hemodialysis patients and the effectiveness of these method have been reported; however, most of the time these methods are not available or are expensive. So, it is essential to use new treatment methods to promote quality of sleep in these patients (Tsaya and Chen, 2003). Today's complimentary treatments such as acupuncture and acupressure which confirmed by Food and Drug

Organization in 1997 are used in curing different disturbances. Regarding the increase in prevalence of blood transmitted disease such as AIDS from 1981, tendency of general population have been changed toward acupressure (Craven and Hirnle, 2003; Reza *et al.*, 2010). In different studies the effects of acupuncture and acupressure have been verified somewhat on pain, asthma, gynecologic pains, vomiting, fatigue and sleep (Tsaya and Chen, 2003; Hung and Chen, 2011). In systematic review by Sok *et al.* (2003) the effect of acupuncture on old adult's sleep have been evaluated by Meta-analysis method and the useful effects of acupuncture on improving the quality of sleep are demonstrated in old adults Sok *et al.* (2003). In acupressure which has come from acupuncture, the same points in acupuncture are pulling by finger (Smeltzer and Bare, 2004; Craven and Hirnle, 2003). effectiveness of acupressure on quality of sleep in old adults and respiratory disorders during sleep have been indicated by Chen *et al.* (1999) and Wang *et al.* (2003). As the patients undesirability to use invasive treatments goes further, the general tendency toward compliment treatments have increased rapidly (Frisch, 2001). Only in 1997, the Americans of United States have paid 21.2 milliard dollars for complimentary treatments; and this had an increase of 45.2% compared to 1990 (Craven and Hirnle, 2003). As worldwide concerns on use of non-drug treatments have increased, there are arguments on addition of non-drug treatment methods to nursing subjects. Although, in advance of this addition the efficiency and safety of selected non-drug treatment methods must be confirmed; and these methods must be in nursing domain (Timby, 2001; Smeltzer and Bare, 2004; Craven and Hirnle, 2003). Acupressure is one of these methods and also the nurses have an excellent situation for use of this method (Frisch, 2001). The safe method of acupressure don't have any side effects and could be administered by patients or the others; moreover, this method do not need special experience or equipments and only needs the use of trained fingers and hands (Tsaya and Chen, 2003; Schlager *et al.*, 2000). Training of acupressure is simple so it can be used for treatment of many disease (Chen *et al.*, 1999). The majority of hemodialysis patients have sleep disorders and use of sleeping drugs will increase their dependency and side effects of drugs. We decided to study the effect of acupressure on improving the quality of sleep in hemodialysis patients in order to suggest a low expense and safe curing method to promote the quality of sleep in these patients. So, the main purpose of this study is to evaluate the effectiveness of acupressure on quality of sleep in hemodialysis patients.

MATERIALS AND METHODS

This is a randomized clinical trial study. There was no sampling frame and the samples entered by census. This sample comprised of 62 hemodialysis patients that were under treatment in Razi hospital in Rasht, Gulan, Iran. The sample randomly divided into experimental and control groups. The inclusion criteria were: have been diagnosed as a patients with renal failure by patient's medical records, capable to participate in study, do not have diabetes, cancers, cerebral infarction and skin disease, undergoing hemodialysis for 3 times per week, at least 3 months have a history of hemodialysis, her/his age greater than 18 years and finally having the low quality of sleep with the score of more than 5 by means of Pittsburgh Sleep Quality Index. The data collection was a questionnaire, comprised of questions on demographic information, Pittsburgh Sleep Quality Index and sleep log. The collected demographic information were gender, age, marital status, number of children, salary, location of habitation, job, having history of dialysis treatment, treatment's shift (morning, evening, nights), take tea, coffee and milk, do exercise and cigarette smoking. The Pittsburgh quality of sleep questionnaire comprised of 19 question in 7 area including sleep quality, time needed to falling sleep, duration of sleep, the usual sleep efficacy, sleep disorders, use of sleep drugs and having disturbance with daily activities. Each area have a score of 3 so the summation of them at most is 21. The patients who received the score greater than 5 have been classified as having low quality of sleep. The results of administered sleep log showed a consistency of 87% with polisomnograohy. The sleep log have 3 question on times of awaking from sleep in each night, time needed to falling sleep again and subjective of quality of sleep, respectively. The scores assigned to them were between 0-10 such that the more the score the better were the quality of sleep. The content validity of the data collection devise were measured by test re test for sleep log and cronbakh alpha for Pittsburgh Sleep Quality Index. The validity coefficient for two equipment were 89 and 81.5%, respectively. The data have been collected by Pittsburgh sleep quality questionnaire before and after intervention and by sleep log during 35 days by patients. The intervention were the use of acupressure for 4 weeks which administered 3 days per week. So the intervention were applied 12 times (sessions) by the researcher and his cooperater one hour after starting dialysis and after telling readiness by patients. The following steps was done during in each session. First of all, the patient sleeps on

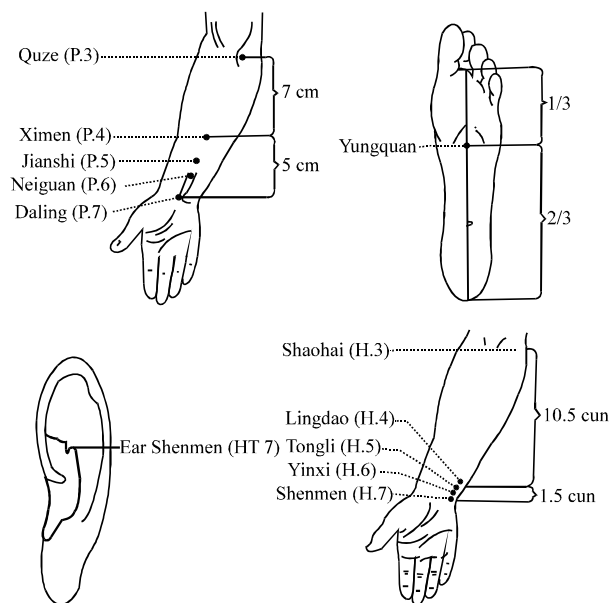


Fig. 1: Steps done during the session

back and breathes deeply five times with nose and expiration them by mouth. After that 4 points were pressured on ear (ear shenmen), wrist (hand shenmen and neiguan) and foot (yung chung). were pressed by finger for 5 min; this pressure was continuous and its force was between 3-4 kg which was done with finger circularly and its rate was about 1-2 per second. The force of finger pressure were practiced using a scale of 20 g to 6 kg. The force of pressure consistency (reliability) for each hand of researchers were confirmed by applying 40 replications on scale (Fig. 1). These points and procedure were selected based on previous studies specially Shio-Luan Tsay studies in this field (Tsaya and Chen, 2003; Schlager *et al.*, 2000; Cerrone *et al.*, 2008).

RESULTS

The mean age of subject was 48.68±13.49 in experimental group and 47.81±11.55 in control group. the gender distribution in experimental and control groups were 61.3 and 58.1%, respectively. Moreover, 77.4% in experimental and 80.6% in control group were married. 35.5% from experimental and 32.3% from control group were graduated from primary school. Less than half percent (45.2) of participants in experimental group were unemployed; this was 51.6% in control group. The received salary for nearly all patients (90.3%) in both groups were under 250, dollars per month. The majority of

participants had a private sleep room (90.3% in experimental and 87.1% in control group). regarding treatments shifts, most of patients were under treatment in both morning and night shift in both groups. The mean duration of dialysis treatment was 4.65±3.29 year in experimental group and 4.94±3.73 years in control group. regarding effective drinks on sleep consisting tea, milk and coffee, the highest rank were assigned to consumption of tea with mean of 2 cups per day. The cigarette smoking was 16.1% in both group; the mean cigarette was 1.17 and 1.09 in experimental and control groups, respectively. Approximately most patient were lived in city (74.2% in experimental and 71% in control group) and do not exercise (only 25.8% in experimental group and 29% in control group do exercise). No statistically significant difference between two groups were seen on demographic variables.

Table 1 shows the result of sleep quality by Pittsburgh quality of sleep index before intervention. The mean of final score in experimental group was 11±2.60 and in control group was 11.12±2.57; there was no significant difference between two groups based on independent t-test. Moreover, in areas no significant differences were seen by Mann-Whitney test. The other results before intervention showed that there was no significant differences between two groups on awaking duration in each night (times awaking each night multiplied by awaking duration each time) and subjective of quality of sleep.

Table 1: Compare means of PQSI scores in both group before intervention

Components	Group				Statistical test
	Study		Control		
	Mean	SD	Mean	SD	
Sleep quality	1.61	0.558	1.65	0.798	NS
Sleep latency	1.68	1.077	1.65	1.112	NS
Sleep duration	1.70	0.824	1.55	0.850	NS
Habitual sleep	2.02	0.752	2.23	0.617	NS
Sleep disturbance	2.02	0.605	1.65	0.608	NS
Sleep sufficiency	1.02	1.224	1.23	1.407	NS
Sleep medication	1.00	0.577	1.16	0.583	NS
Global PSQI	11.09	2.620	11.12	2.575	NS

Ns: Not significant

Table 2: Compare means of PQSI scores in both group after intervention

Components	Groups				Statistical test
	Study		Control		
	Mean	SD	Mean	SD	
Sleep quality	1.16	0.523	1.52	0.677	p = 0/042
Sleep latency	1.06	0.727	1.68	1.013	p = 0/007
Sleep duration	0.84	0.820	1.35	0.755	p = 0/017
Habitual sleep	1.52	0.769	2.35	0.661	p = 0/0001
Sleep disturbance	1.45	0.568	1.84	0.638	p = 0/024
Sleep sufficiency	0.71	1.101	1.03	1.110	NS
Sleep medication	0.68	0.541	1.19	0.654	p = 0/002
Global PSQI	7.42	2.74	10.96	2.960	p = 0/001

Ns: Not significant

The results after intervention on quality of sleep showed that the mean of final score in experimental group was 7.42±2.74 and in control group 10.96±2.96 (Table 2). This result were significant by independent t-test (p = 0.001). moreover, the quality of sleep in all areas except area number six have increased; this results were assessed by means of Mann-Whitney test.

The results showed that the sleep quality have increased gradually. Acupressure improved sleep quality immediately after starting treatment and this improvement continued until one week after treatment.

DISCUSSION AND CONCLUSION

The findings of this paper showed that the quality of sleep in experimental group have been increased significantly compared to control group. The areas of quality of sleep such as subjective of quality of sleep, time needed to fall sleep, overall duration of sleep, the usual sleep efficacy, sleep disorders and usual practice disorders have improved in experimental group. Although the mean use of sleeping drugs in experimental group (0.71±1.10) was lower than control group (1.03±1.11) but there was no significant difference between them; this result indicates that quality of sleep has increased in experimental group.

It seems that the acupressure could be a useful method for improving the quality of sleep in hemodialysis patients. In this regard Chen *et al.* (1999) in studying the effect of acupressure on improvement the quality of sleep in old adults indicated that acupressure causes improvement in quality of sleep on duration, sufficiency and sleep disorders areas from Pittsburgh quality of sleep index and also rate of awaking from sleep at night and stay awaking in night was decreased in experimental group (Chen *et al.*, 1999). In another study by Wang *et al.* (2003) the effect of acupressure on treatment of Apnea syndrome during sleep were assessed. The findings of this study showed the significant decrease in Apnea measure and Hypopnea measure in experimental groups (p<0.01) and mean of artial oxygen pressure in experimental group have increased and poly somnographical parameters have improved in this group (p<0.01). However, no significant changes were found in control group (Wang *et al.*, 2003). Samner *et al.* (2002) studied the effect of acupuncture on serotonin and tryptophan synthesis and movement activities in mouse. Their results showed that even after one session acupuncture the rate of serotonin in biopsies from mouse brain have been increased (Lee *et al.*, 2002). Moreover, in this regard Chen *et al.* (1999) and Tsay *et al.* (2003) said that the acupressure promotes the patient's sleep quality in beginning days (Tsaya and Chen, 2003; Chen *et al.*, 1999).

The current study showed that the acupressure is an effective way for promoting the quality of sleep in hemodialysis patients and its effects begins from first treatment session. This findings suggested a good, safe and low expense method for treatment of sleep disorders in hemodialysis patients. Training of this method is easy and it applicable by nurses and even by patients. In this study we used a simple questionnaire; however applying the more precise equipments such as Polysomnography and movement activities measure for assessing the quality of sleep is suggested for future studies. In addition as the quality of sleep influences on efficacy and quality of life in hemodialysis patients, we suggest more studies in this issue to confirm effectiveness of acupressure on quality of sleep, quality of life and efficacy in these patients.

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