



The effect of consuming oral Vitamin C on exhaustion of hemodialysis patient caregivers

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ARTICLE INFO

Article type:
Original article

Article history:
Received: 5 Nov 2012
Revised: 9 Apr 2013
Accepted: 23 Apr 2013

Key words:
Oral Vitamin C
Hemodialysis Patient
Fatigue
Caregivers

ABSTRACT

Aims: Due to increasing the number of Hemodialysis patients and also the necessity of consistent and continuous cares by family members to patients, we have been up to doing a test in order to find out the effects of oral Vitamin C on tiredness and exhaustion of hemodialysis patient caregivers according to researches that have been done on the effect of oral Vitamin C on fatigue.

Methods: This research is a before-after one-group semi experimental study of a that has been done in 2012. The samples were 25 caregivers who have been coming to the selected hospital in Tehran and they had been chosen randomly and purposively. At first The Multidimensional Fatigue Inventory MFI-20 Questionnaire was completed by research samples before intervention and after a month of using oral Vitamin C the Questionnaire was completed once again. After collecting the data by descriptive statistics and paired t-test the data had been analyzed by SPSS 17 software.

Results: The samples were 48% male with the age average of 44.4 and 72% married. In general exhaustion and fatigue, physical fatigue, mental fatigue and reduced activity dimensions significant difference ($p < 0.05$) had been observed but there was no significant difference in the reduced motivation dimension.

Conclusions: According to the results, using oral Vitamin C can be recommended for reducing the fatigue of caregivers and thereupon increasing the quality of care given to Hemodialysis patients.

Please cite this paper as:

Pourebrahimi M, Rahimi A, Tayebi A, Ebrahimi H. The effect of consuming oral Vitamin C on exhaustion of hemodialysis patient caregivers. Iran J Crit Care Nurs 2013;6(2):95-100.

1. Introduction

Chronic kidney failure is irreversible impairment of kidney function [1]. In the past, chronic kidney disease was considered merely a health issue, but now it has become a problem

and global health threat. More than one million people lose their lives every year due to end-stage renal disease [2]. It is while, the statistics of patients with chronic renal failure is increasing dramatically in the world [3].

The number of patients with end stage renal disease is doubling every 7 years [4]. The amount of prevalence of global chronic kidney failure is 242 cases in one million people and

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annually 8% will be added to this rate. According to the Department of Health Management Center for Transplantation and Special Diseases of health Ministry the Annual growth of chronic renal failure in Iran is about 11% and in 2009 it reached almost to 40 thousand people. The annual incidence rate of the disease is 53 cases for every one million people and according to the statistics in Iran 1200 to 1600 people per year are affected by this disease [5,6].

These patients without renal replacement therapy are unable to survive, at the end of 2005 1 million and 900 thousand people in the world were treated by alternative therapies that among these people 68% of them were treated by hemodialysis, 8% by peritoneal dialysis and 23% by transplantation continued their lives. About 53/7% of patients with chronic renal failure in Iran are undergoing hemodialysis and 45/5% of them did the transplant [7].

End stage renal failure is a chronic disease that the family should do supportive functions for dialysis patients both at home and in outpatient care centers such as dialysis units in hospitals. Due to continuous and repeated visits of these patients to hemodialysis centers, the greater responsibility for the care of these patients is up to the family members. These caregivers are faced with major problems such as fatigue. Caregivers of renal patients often spend a lot of time for medical interventions and they endure a significant fatigue and suffering [8].

Moreover, family social and psychological functions of hemodialysis patients may be affected by fatigue. Caregivers do not have their previous energy, do less activities and for minimal daily activities they put greater efforts into work, so this issue will affect their quality of life and self-esteem [9]. The average time for hemodialysis patients in hospital is 14 days a month. These factors can lead to fatigue and pain for Caregivers and Caregivers of these patients as well as other caregivers of chronic patients; have excessive emotional involvements [10].

Fatigue is a subjective feeling of weakness, lack of energy and tiredness [11]. The North American Nursing Diagnosis Association defined fatigue as weakness and decreased capacity for physical and mental activity [9]. Fatigue is a natural and important response to excessive physical activity, prolonged mental stress and sleep deprivation; it can also be a sign of a physical or mental disorder of non-specific. Fatigue does not only significantly impair the performance of a person it also can have a negative impact on the health and quality of life [12].

In 2000, Harris et al. had some findings about fatigue index in caregivers of patients with end stage renal which represents increased fatigue in them [13]. This common complaint, which is a vague and unpleasant symptom and is described with the range from regular fatigue to the full discharge of energy, is arising from difficult situations that require the capabilities more than a person's ability [14]. Fatigue is one of the most important side effects of vitamin C deficiency [15]. Decreased antioxidants and increased oxidative products are among effective factors in activation of the destruction of red blood cells and Hemolysis which at the end provides a background for anemia [16].

However, vitamin C is necessary for converting tyrosine into chemically mediated neuronal Norepinephrine and amino acid tryptophan into the precursor of Serotonin, a chemically mediated neuronal and any problems for producing these necessary compounds may cause Fatigue [17]. Recent studies have shown that oxidative stress is effective in clinical symptoms and pathology of chronic fatigue syndrome and antioxidants potentially have a therapeutic role in reducing oxidative stress injuries [18].

Jung et al. research findings In 2005, which had been done on 31 patients with chronic fatigue In Seoul indicated that prescribed B-Complex with Vitamin C intravenously for a month, decreased Fatigue mean significantly from 5.2 to 3.3 [19]. Since fatigue is one of the most

important side effects of vitamin C deficiency [8] Researcher decided to assess the effects of vitamin C pill on caregivers’ fatigue of patients receiving hemodialysis treatment.

2. Methods

The present study is a single-group quasi-experimental study and with the method of before and after which was conducted in 2011 in Baqiatallah hospital of Tehran. The subjects in this study were 25 caregivers of patients undergoing hemodialysis who had been admitted to the dialysis unit. Sample size had been estimated 30 people by counting 5% Alpha and test power of 80% by using Altman Nomogram and the least expected difference in the averages and by counting 15% loss.

These caregivers must have lived in the home with hemodialysis patients and were accompanied hemodialysis patients at least two times a week to a medical center for doing hemodialysis. Also for inclusion criteria it can be pointed to lack of cooperation of the caregivers in any stages of the research and lack of consumption of vitamin C pill completely. The sampling method was nonrandom and purposive.

A multidimensional Fatigue questionnaire-20 was used as research tools [20]. The questionnaire consists of five distinct dimensions of general fatigue, physical fatigue, mental fatigue, reduced activity and reduced motivation.

Each dimension consists of four questions and

Table 1: Demographic characteristics of subjects

Percentage	Frequency		Variable
48	12	Male	Gender
52	13	Female	
20	5	Undergraduate	Education
48	122	Diploma	
8	5	Associate	
29	1	BS	
4		Masters	
72	18	Married	Marital status
28	7	Single	
8	2	Military	Job
8	2	Employee	
16	4	Retired	
16	4	Free job	
44	11	Housekeeper	
8	2	Unemployed	
32	8	Low	
48	12	Moderate	
20	5	Well	

Table 2: Comparison of fatigue before and after the intervention

Sig	Paired T statistics	after the intervention The mean (\pm SD)	Before the intervention The mean (\pm SD)	Dimensions of fatigue
0.001	3.952	10.16 (\pm 3.05)	13.76 (\pm 2.78)	General fatigue
0.004	3.187	8.04 (\pm 2.63)	10.76 (\pm 3.21)	Physical fatigue
0.014	2.636	7.68 (\pm 3.36)	11.92 (\pm 8.37)	Decreased activity
0.217	1.268	7.68 (\pm 2.54)	8.52 (\pm 2.83)	Reduction in Motivation
0.001	3.727	8.20 (\pm 2.73)	11.56 (\pm 3.77)	Mental fatigue

answers that are collected in a 5-choice spectra, therefore the total score for each domain is between 20-4 and the total score of fatigue that is determined by summing the scores of domains, will be between 100-20. Higher scores indicate more fatigue. Validity and reliability of the questionnaire have been determined in English [20,21]. After informed consent of the subjects of the study questionnaire of fatigue was completed by them before the intervention and in the next stage the tutorials for consuming 250mg vitamin C pill for one month were given to the caregivers and sufficient numbers of Vitamin C pills were distributed among them. After a month the fatigue questionnaire was completed again by the subjects. After data collection, they were analyzed and measured by using descriptive statistics and paired t-test method and by using spss17 software.

Initially, Quantitative variables such as dimensions of the fatigue questionnaire were examined by Kolmogorov - Smirnov test in terms of distribution, which was normal because of $p < 0.05$.

3. Results

. 48% of these samples were male with a mean age of 44.4 and 72% of them were married (table No.1). In this study, the mean reduction in fatigue after the intervention in compare with before the intervention had a significant

difference in dimensions such as general fatigue, physical fatigue, mental fatigue and reduced activity ($p < 0.05$) it is while, the reduction in motivation dimension had no significant difference before and after the intervention (table No.2).

4. Discussion

Fatigue is considered a debilitating symptom or side effect for many caregivers of hemodialysis patients that can have several effects on physical, cognitive and emotional areas of the patients. End stage renal failure is a chronic disease which the family should do supportive functions for dialysis patients both at home and in outpatient care centers such as dialysis units in hospitals [8].

Considering repeated and continuous reference of these patients to hemodialysis centers the greater responsibility for the care of these patients is up to the family members (caregiver). These caregivers are faced with major problems such as fatigue. Our findings showed that in caregivers of patients undergoing hemodialysis general fatigue, physical fatigue, mental fatigue and reduced activity were evident. in the study of Zahri et al. in 2006 with the title of assessing the problems of the main caregivers of patients with Alzheimer's disease showed that 62 percent of caregivers are experiencing fatigue, which is also consistent with our study [22].

In another research by Yuhuang in 2004, results showed that the caregivers of patients with Alzheimer's disease are to the risk for fatigue and depression [23]. All this content reflects the high prevalence of fatigue in the caregivers. In this study it was shown that there was significant difference in the fatigue of subjects before and after the intervention which was consistent with the findings of Jung et al. Study in 2005.

Jung et al. Research in 2005, which was done on 31 patients with chronic fatigue In Seoul, indicated that prescribed intravenously Vitamin C with B-complex for a month, decreased Fatigue significantly from 5.2 to 3.3 [19]. In 2006 Weissinger et al. in a trial study prescribed oral 250 mg of vitamin C three times a week for hemodialysis patients to determine its effects on oxidative stress and exhaustion and higher doses of this vitamin were suggested in further researches [24]. In our study, it was shown that oral vitamin C supplementation was effective in reducing fatigue in study subjects which is consistent with Farmahini et al study (2009).

The title of the study was Effects of oral vitamin C on fatigue in patients with chronic renal failure undergoing hemodialysis, Fatigue level were compared with before the intervention and after the intervention , which showed that the sample group's fatigue level compared to the fatigue level of the control group, had significantly decreased after the intervention [9]. Among the limitations of this study it can be pointed to being low size of the samples and also being a single group.

5. Conclusions

In this study, considering the presence of fatigue in dialysis patient's caregivers, the results confirm the research hypothesis that is the effect of vitamin C on fatigue. So we believe that considering the evidence in the similar studies and lack of doing research with this title on caregivers of HD patients in our

country, the necessity to do this study in higher doses and allowed forms of oral vitamin C in the long term is more tangible and the results of this study considering the effects of fatigue as a common complaint in caregivers of HD patients on Individual psychological and social aspects, can be generalized for utilization and can be used in future studies.

6. Acknowledgments

We Thank and appreciate to those who helped us in all the stages of this research and special thanks to the personnel of hemodialysis unit and hemodialysis patient's caregivers.

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