Critical Care Nursing
Journal home page: www.inhc.ir
Iran J Crit Care Nurs. 2015;8(2):109-116

The relationship between quality of life with dialysis efficacy and laboratory parameters in Shahroud' hemodialysis patients

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ARTICLE INFO

Article type:
Original article

Article history:
Received: 9 Feb 2014
Revised: 14 Jun 2015
Accepted: 27 Jun 2015

Key words:
Hemodialysis
Quality Of Life
Dialysis Adequacy
Laboratory Parameters

ABSTRACT

Aims: Identifying and modifying factors such as inadequate dialysis and consequently disability and mortality that may influence hemodialysis patients' quality of life can cause more appropriate level of health in these patients. This study is done with the aim of "determining relationship of quality of life with dialysis adequacy and laboratory parameters in hemodialysis patients".

Methods: In this cross-sectional study, 99 hemodialysis patients were investigated through convenient sampling in 2013. The tools of the study included: quality of life questionnaire specialized to dialysis patients, KT/V for determining dialysis adequacy and albumin, Hemoglobin, Fasting Blood Sugar (FBS), creatinine, Bilirubin, Potassium, Sodium, Calcium and Phosphorus laboratory parameters. After collecting data, the relationship between them was determined. SPSS16 software, Pearson correlation and ANOVA statistical tests were used for data analysis.

Results: Quality of life and dialysis adequacy of the subjects of the study were not in an appropriate level. There was a significant difference ($p<0.05$) between quality of life and dialysis adequacy. Also there was a significant statistical correlation between the score of quality of life and albumin, hemoglobin, bilirubin, creatinine, potassium, calcium and phosphorus parameters ($P<0.05$). But there was no significant correlation between FBS and Sodium with the score of quality of life.

Conclusions: More appropriate level of quality of life can be achieved for these patients through planning and implementing nursing interventions regarding increase of dialysis adequacy and improvement of some parameters.

Please cite this paper as:
Ebrahimi H, Sadeghi M, Khatibi MR. The relationship between quality of life with dialysis efficacy and laboratory parameters in Shahroud' hemodialysis patients. Iran J Crit Care Nurs. 2015;8(2): 109-116.

1. Introduction

Chronic renal failure is an important health problem. High percentage of these patients would need renal alternative treatments; among these treatments, hemodialysis is one of the most common treatments and it causes decrease of symptoms and maintains life of these patients [1].

The prevalence and incidence of advanced renal failure in the world is reported 242 in one million people and 8% is annually added to this amount [2]. According to the available reports,

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the prevalence of this disease is increasing in Iran. The annual prevalence of this disease in Iran is about 29000 people that 14000 of them are being treated by hemodialysis [3]. Controlling hemodialysis patients is hard and their complications and problems are defined as a global problem. These patients have low quality of life and survival and fundamental changes occur in their life style [4, 5]. In addition to the changes in their physical status, these patients are encountering with several other stressors such as emotional, psychological, socio-economic and family stressors [6]. From the other side, several studies indicate that inadequate dialysis is important in increased mortality and pathogenicity of hemodialysis patients [7, 8].

Hemodialysis influences these patients' lifestyle, health status and their individual roles [9]. Different costs of treatment and limited coping skills with various life situations lead to low quality of life in hemodialysis patients [10]. Hemodialysis patients experience different problems and it may have a negative impact on their quality of life; so that quality of life of these patients is remarkably lower than the ordinary people [11, 12]. Quality of life is something beyond the concept of health since health is only one aspect of quality of life and other factors influencing quality of life include one's own satisfaction, family, social, economical and more important psycho-emotional status [6]. Quality of life is a gap between people's expectation and their experiences of life. Typically patients with similar clinical conditions report different quality of life [13]. Quality of life also includes the feeling of physical and mental well being and it helps logical development and maintenance of patients' physical, emotional and intellectual performance [14]. Symptoms, complications and treatment of disease have an important impact on hemodialysis patients' quality of life of, which is a strong and independent predictor of morbidity and mortality in these patients [15, 16].

Quality of life is influenced by and associated with many factors. For example results of the study of Aghakhani et al. (2012) showed that there is a significant relationship between quality of life and physical, emotional and social status of these patients [17]. From the other side, it has been shown that adequate treatment with dialysis can decrease complications and costs of dialysis in these patients [7, 18]. Considering inadequate studies in this regard and the importance of improvement of clinical status in these patients, this study is done with the aim of determining relationship between quality of life and quality of dialysis and some laboratory parameters in hemodialysis patients.

2. Methods

This cross-sectional study was done on the older than 18 years old patients who came to Imam Hosein hospital of Shahroud in 2013 for hemodialysis. This hospital was selected for doing the study since having access to the samples of the study was easy there; all the patients who were able to read and write or speak and were coming to the hospital for hemodialysis regularly were included in the study. Among 118 hemodialysis patients only 102 patients had the inclusion criteria; three patients were excluded from the study, one because of lack of willingness to cooperate and two other ones because of exacerbation of physical conditions during the study and finally 99 patients participated in the study.

Ethical considerations including taking permission of the relevant authorities, introducing the researcher to the subjects of the study, explaining the aims and the nature of the study, taking written consent from the patients and finally reassuring the patients that their information will remain confidential were respected. The tools of the study included two parts; the first part was the form of collecting

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Table 1: Demographic information related to disease in patients suffering from diabetes type 2

Feature of the study		Number/percent
Average age (year)		50.92±10.98
Gender	Male	61(61.6%)
	Female	38 (38.4%)
Education level	Elementary	42 (42.4%)
	Secondary	35 (35.6%)
	Diploma and higher	22 (22.2%)
Dialysis experience	Less than 2 years	36 (36.3%)
	2-4 years	41 (41.4%)
	More than 4 years	22 (22.3%)
Number of dialysis per week	Two times	29 (29.3%)
	Three times	64 (64.6%)
	4 times	6 (6.1%)

demographic data and Kidney Disease Quality of Life questionnaire (KDQUL); this questionnaire is a multi-dimensional, valid and reliable tool [19] and it benefits high degree of internal consistency and correlation [20] and it provides deeper and broader interpretation of the variables related to quality of life of hemodialysis patients [21].

The second part, which was about information, was collected through checklist. KT/V index, which was confirmed and recommended by America Kidney National Studies Association, was used for determining dialysis adequacy. This association has reported that the KT/V dialysis adequacy guideline is more than or equal1.2 [22]. Patients were categorized in three groups including: lack of adequacy dialysis (KT/V between 0.70 to 0.89), relatively appropriate dialysis adequacy (KT/V between 0.9 to 1.29) and completely appropriate dialysis adequacy (KT/V between 1.3 to 1.6); as you can see this classification has been done according to KT/V amount.

Another part of this checklist was the laboratory parameters including; Albumin, hemoglobin, FBS, bilirubin, creatinine, potassium, sodium, calcium and phosphorus; their amounts were extracted from the patients' files. The tests were done in the laboratory of Imam Hosein hospital. After data collection, relationship between data and quality of life was analyzed by using spss16 software and Pearson correlation coefficient statistical tests and ANOVA.

3. Results

99 patients participated in this study. The average age of the patients was 50.98±10.98 years old; most of them were male, with primary education, most of them had 2-4 years of dialysis experience and they were undergoing dialysis three times a week (table1). Total average of quality of life was 56.34±16.76 and the study of the done dialysis adequacy for the patients showed that the average of KT.V in all the patients was achieved 1.12±0.89, which was lower than the

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recommended amount; there was a significant difference between quality of life and dialysis adequacy, patients with higher quality of life had more appropriate dialysis adequacy (table 2).

Also there was a significant statistical correlation between total score of quality of life and albumin, hemoglobin, bilirubin, creatinine, potassium, calcium and phosphorus parameters; so that there was a negative correlation between quality of life and albumin, FBS, bilirubin, creatinine, potassium, sodium and phosphorus laboratory parameters, and there was a positive correlation between hemoglobin and calcium with quality of life, but there was no significant correlation between FBS and Sodium with the score of quality of life (table 3).

4. Discussion

In this study, quality of life and dialysis adequacy of the subjects of the study were not in an appropriate level and there was a significant difference between quality of life and groups of dialysis adequacy; patients with higher dialysis adequacy had more appropriate quality of life.

In Iran, quality of life of hemodialysis patients is lower than other countries [25, 26]; it can be due to improper nutrition, deficit in self-care activities or inadequate dialysis in these patients.

In order to improve quality of life of hemodialysis patients, it is necessary to recognize factors that cause low quality of life in these patients [23, 24]. If hemodialysis patients understand the reasons of reducing sodium, phosphorus, potassium and fluid from their dietary, they would have more appropriate quality of life for several years [25].

Also total average of KT.V was lower than the least recommended amount and it shows that dialysis adequacy is not appropriate in most of

Table 2: relationship of quality of life and dialysis adequacy in hemodialysis patients

KT.V level				P-Value
Variable	Lack of adequacy	Relatively appropriate	Appropriate	(*One-Way ANOVA*)
Quality of life (μ±SD)	48.57±16.36	55.48±16.63	59.81±16.72	p<0.001 t=0.39

Table 3: relationship of quality of life and laboratory parameters in hemodialysis patients

	Laboratory parameters and Pearson correlation coefficient p value								
	Alb	Hb	FBS	Bilirubin	Creatinine	Potassium	Sodium	Calcium	Phosphorus
Quality of life	r=0.26 p=0.05	r=0.51 p<0.001	r=-0.02 p=0.19	r=-0.39 p=0.01	r=-0.13 p=0.04	r=-0.66 p=0.001	r=-0.17 p=0.11	r=0.57 p<0.001	r=-0.49 p<0.001

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the patients. This result is in consistent with other studies, which have been done in Iran, for example in the study of Raiesifar et al. (2007) in Abadan, KT.V was 0.9 and most of the patients had inappropriate dialysis adequacy [27]. Also in the study of Delavari et al. (2008) in Kordestan, the average of KT.V was 0.94 [28]. Some factors such as stenos of the end of veins of arteriovenous fistula, poor and weak fistula, lack of following the schedule of dialysis by the patient, cardiovascular diseases, hemodynamic instability, infections, malignancies, re-circulation, reuse of dialysis filter, etc can be the important causes of low dialysis adequacy [29].

Several studies have shown that if dialysis is not done to the required and adequate level, uremia complications will be increased [30-32], which can influence different aspects of life. Results of different studies indicate that better dialysis adequacy leads to better situation of life and higher life expectancy, and the impact of uremia complications on different systems of the body and patients' mortality rate will be decreased [33].

Also results of a study showed that uremia complications such as; it chy skin and vascular infection due to inadequate dialysis will influence hemodialysis patients' quality of life [34]. Therefore adequate dialysis decreases hemodialysis patients' complications and problems and improves their quality of life.

In studying relationship between the score of quality of life and the amounts of laboratory parameters, results showed that there is a significant and positive correlation between the score of quality of life and hemoglobin level, which means that increase of quality of life leads to increase of hemoglobin level. Different studies have shown that anemia is a risk factor for morbidity, mortality and hospitalization [35-38]. Study of Moreno (2000) in this regard showed that dialysis patients with more appropriate (higher) hematocrit and hemoglobin levels have more appropriate quality of life [39].

Also results showed that there is a direct and significant correlation between the score of quality of life and serum albumin level; so that increased quality of life leads to increased serum albumin. Although Ohri-Vachaspati and Sehga in their study showed that inadequate protein intake, which is reflecting low levels of serum albumin and low-protein catabolic rate is related to low quality of life in hemodialysis patients [40], results of several studies indicate that there is a relationship between quality of life and serum albumin [41,42].

Also in the study of Kalantar-Zadeh et.al, there was a significant relationship between quality of life and albumin serum; so that patients with lower level of albumin had lower level of quality of life [24]. In the study of Lopes et.al (2007) also there was a significant relationship between Hypoalbuminemia and quality of life [43]. Results of the above studies are in consistent with the present study.

There was a significant and negative correlation between creatinine and quality of life in the present study. Serum creatinine is a very important factor that influences patients' quality of life [44]. In the study of Namadi vosoughi and Movahedpou, most of the people who had normal creatinine had a very good quality of life [45]. In the study of Kalantar-Zadeh et.al, also there was a significant relationship between the score of quality of life and creatinine level [24], which is in consistent with the results of the present study.

In the present study, there was a significant and positive correlation between calcium level and quality of life and there was a significant and negative correlation between potassium and phosphorus with quality of life. Although there is no study in this regard, an extensive study in America showed that high level of phosphate is one of the very important factors of the complications and mortality in hemodialysis patients [46].

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Among the limitations of this study, it can be pointed out to low number of the study subjects and sampling at particular time and place; it is recommended to conduct some studies with larger sample size for better assessment of the casual relationships in hemodialysis patients.

5. Conclusions

Results showed that improvement of dialysis adequacy and most of the laboratory parameters lead to improvement of quality of life in these patients. Specific situations of hemodialysis patients are counted as a threat to the health of these patients in terms of different aspects of life, and improvement of clinical situations through improvement of dialysis adequacy and necessary interventions such as improvement of dietary can be very important in controlling disorders due to the disease process and consequently preventing the risk of many complications in these patients.

6. Acknowledgments

The present study is a part of an approved project with No. 9116 of the research deputy of Sharoud Medical Sciences University; the researchers thank and appreciate the deputy's financial and spiritual support.

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