The Relationship of Physiological factors and Fatigue in Elderly Patients with Chronic Kidney Disease

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Abstract. The purpose of this study was to identify the relationship between Physiological factors and fatigue in elderly predialysis patients with Chronic Kidney Disease (CKD). The subjects of the study were 136 elders over 65 years of age who visited the nephrology outpatient department of a tertiary hospital in Seoul between December 24th and December 31th, 2012 and consented to participate in the study. The physiological factors included hemoglobin, albumin, karnofsky performance scale (KPS) and glomerular filtration rates (GFRs). The data were analyzed using the SPSS v.12.0 program. There were negative correlations between fatigue and hemoglobin, albumin, KPS and GFRs. In addition, gender, age, hemoglobin, albumin and KPS predicted value accounted for 43.7% of the variance on fatigue. As a conclusion of these findings, it has been recommended that these variables should be considered when planning an approach towards managing the fatigue in elderly predialysis patients with CKD.

Keywords: predialysis, physiological factors, fatigue

1 Introduction

The theoretical frameworks for understanding fatigue include the theories of : unpleasant symptoms, peripheral and central fatigue, and a multidimensional fatigue experience in patients with ESRD [1]. Physiological causes include anemia, malnutrition, uremia, hyperparathyroidism, coexisting chronic illnesses, sleep disorders, depression, and side effects of medications [2]. Physical inactivity has been associated with greater levels of fatigue [3].

Studies of predialysis patients with chronic kidney disease (CKD), reported significantly improved fatigue symptoms in patients with higher hemoglobin levels [4]. It is believed that uremic syndrome may manifest as fatigue and weakness, the association between fatigue and such biochemical markers as albumin, creatinine and urea reduction ratio. Uremia may lead to protein and energy malnutrition, nausea, and loss of appetite, which can all contribute to fatigue [5].

The aim of this study is to explore the association between fatigue and physiological factors in elderly predialysis patients with CKD.

2   Methods

2.1   Research objects and method

The subjects of the study were 136 elders over 65 years of age who visited the nephrology outpatient department of a tertiary hospital in Seoul between December 24th and December 31th, 2012 and consented to participate in the study. Those who agreed to answer the questionnaire were given it. Regarding GFRs, serum hemoglobin and albumin, Electronic Medical Record (EMR) was referred.

2.2   Research tools

The fatigue of subjects was assessed using the Fatigue severity scale. The anemia and nutritional status of subjects was assessed using the serum albumin and hemoglobin. The physical function of subjects was assessed by the KPS.

2.3   Data analysis

Collected data were statistically analyzed with the SPSS WIN (ver. 12.0) program. Analysis include descriptive statistics, Pearson correlation and multiple regression.

3   Results

3.1   General characteristics of the patients

The general characteristics of the patients are shown in Table 1. Participants included 61.8% male and averaged 71.7 years of age. Unemployed was identified in 71.3%, below middle school graduate in 47.1% of the participants.

Table 1. General characteristic of subjects

		N=136
Variable		N(%) or Mean±SD
Gender	Male	84(61.8)
	Female	52(38.2)
Age		71.7±6.8
	65-74	96(70.6)
	≥75	40(29.4)
Occupation	Yes	39(28.7)
	No	97(71.3)

Educational level	≤Middle school	64(47.1)
	High school	37(27.2)
	≥College	35(25.7)

3.2 Fatigue and related factors of elderly predialysis patients

The fatigue level showed a maximum score of 63 with a mean score of 38.5<Table 2>. The mean level of hemoglobin, albumin, KPS and GFRs were 11.0, 3.7, 76.7 and 21.3 respectively.

Table 2. Fatigue and physical factors of elderly predialysis patients

	N=136
Variable	Mean(SD)
Fatigue	38.5(16.8)
Physiological factors	
Hemoglobin, g/dl	11.0(2.0)
Albumin, g/dl	3.7(0.5)
Karnofsky performance scale	76.7(9.6)
Glomerular filtration rates, mL/min/1.73m²	21.3(13.6)

3.3 Fatigue according to physiological factors of elderly predialysis patients

There were significantly positive correlations between fatigue and age(r=.273, p=.001), female(r=.247, p=.004)<Table 2>. There were significantly negative correlations between fatigue and hemoglobin(r=-.271, p=.001), albumin(r=-.252, p=.003), KPS(r=-.591, p<.001) and GFRs(r=-.292, p=.001).

Table 3. Fatigue according to physical factors of elderly predialysis patients

	N=136
Variable	Fatigue r(p)
Demographic factors	
Age	.273(.001)*
Gender	.247(.004)*
Occupation	.126(.58)
Educational level	-.106(.60)
Physiological factors	
Hemoglobin, g/dl	-.271(.001)*
Albumin, g/dl	-.252(.003)*
Karnofsky performance scale	-.591(<.001)*
Glomerular filtration rates, mL/min/1.73m²	-.292(.001)*

*p<.05

3.4 Factors of affecting the fatigue in elderly predialysis patients

Factors of affecting the fatigue in elderly predialysis patients are shown in Table 4. Age(p=.001), gender(p=.001), Hemoglobin(p=.041), Albumin(p=.034) and KPS(p<.001) predicted value accounted for 43.7% of the variance on fatigue(F=14.38, p<.001).

Table 4. Factors of affecting the fatigue in elderly predialysis patients

N=136

Factor variables	Standardized Beta	t	p	Adj R²²	F	p
Constant				.437	14.38	<.001
Age	.185	3.51	.001			
Sex	.122	3.65	.001			
Hemoglobin	.050	-3.16	.041			
Albumin	-.037	-3.45	.034			
KPS	-.490	-5.89	<.001			
GFRs	-.105	-1.14	.253			

4 Discussion

This study was to identify the relationship between fatigue and physiological factors in elderly predialysis patients with CKD.

As a conclusion of these findings, it has been recommended that these variables should be considered when planning an approach towards managing the fatigue in elderly predialysis patients with CKD.

References

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