

The Effect of Gender and Age on Nutritional Status of Hemodialysis Patients

Wu HC¹, Lin WC², Wu PY³, Yang SH^{1,4}

^{1,2,3}School of Nutrition and Health Sciences, Taipei Medical University

⁴Nutrition research center, Taipei Medical University Hospital

Introduction

The prevalence of malnutrition is high in dialysis patients. Malnutrition increases the morbidity and mortality. However, elder hemodialysis patients have less dietary intake. Poor dietary intake is one of the major cause of malnutrition among dialysis patients. Besides, women eat less dietary energy and protein than men which may contribute to increase malnutrition risk.

Objective

This study purpose is to find out the effect of gender and age on nutritional status of hemodialysis patients.

Subjects and Methods

One hundred and seven chronic hemodialysis(CHD) subjects were recruited from Wanfang Hospital and Taipei Medical University Hospital in Sep. 2010. All subjects had hemodialysis treatment at least 3 months. Subjects were divided into tertile groups by age, ≥ 50 years, 51-70 years and > 70 years.

The data of demographic, anthropometric and laboratory were collected. Serum albumin, creatinine, and GNRI (geriatric nutritional risk index) score were used as nutrition status marker. All subjects wrote 3-day dietary records, and analyzed their dietary energy and protein intake.

All values presented as mean $\pm$ SE or number. We used *t* test to compare data between male and female subjects, and one way ANOVA or chi-square test to compare with different age group. When *p* value less than 0.05 was considered as significantly different.

Results and Discussion

Comparing to male hemodialysis patients, the female patients had similar level of all nutrition status markers (*p* > 0.05 , table 1). No significantly different in characteristic data and dietary intake between gender. Subjects who were more than 70 years had significantly lower BMI (body mass index), GNRI score, serum albumin and creatinine than those fifty and less (*p* < 0.05 , table 2). Therefore, elder subjects may have poorer nutritional status than younger subjects. Previous studies showed that elder people loss their body weight more than 0.68kg per year, and most of lost body weight is muscle mass. Ageing caused lower serum albumin level and maybe one of the malnutrition risk factors of hemodialysis patients.

However, we did not find elder subjects had significantly decreased dietary energy and protein intake. Maybe inadequate dietary energy and protein intake were not major contributors of malnutrition in these patients.

Conclusion

There was no significantly malnutrition different in CHD patients between gender, but significantly different among age groups, especially older than 70 years old.

Table 1. Data of demographic, anthropometric, laboratory and dietary between male and female.

	Male (n = 53)	Female (n = 54)	<i>p</i>
Age, years	64.3 $\pm$ 1.9	62.5 $\pm$ 2.1	0.545
BMI, kg/m ²	23.0 $\pm$ 0.5	23.1 $\pm$ 0.6	0.889
Hemoglobin, mg/dl	10.7 $\pm$ 0.2	10.3 $\pm$ 0.2	0.071
Albumin, g/dl	4.0 $\pm$ 0.0	3.9 $\pm$ 0.1	0.175
Creatinine, mg/dl	10.9 $\pm$ 0.4	10.0 $\pm$ 0.4	0.111
Potassium, mEq/L	4.5 $\pm$ 0.1	4.6 $\pm$ 0.1	0.325
Phosphate, mg/dl	5.3 $\pm$ 0.2	5.0 $\pm$ 0.2	0.229
CaxPO ₄ , mg ² /dl ²	49.7 $\pm$ 1.6	46.3 $\pm$ 2.1	0.197
Kt/V	1.54 $\pm$ 0.05 ^b	1.71 $\pm$ 0.03 ^a	0.005
GNRI	99.5 $\pm$ 0.8	97.9 $\pm$ 1.0	0.227
Dietary calorie, kcal/kg	24.6 $\pm$ 1.1	24.2 $\pm$ 1.1	0.792
Dietary protein, g/kg	0.97 $\pm$ 0.05	0.97 $\pm$ 0.04	0.982

Variable are expressed as mean $\pm$ SE. BMI: body mass index; BUN, blood urea nitrogen;; CaxPO₄, calcium phosphate product; Kt/V; GNRI, geriatric nutritional risk index; Values with different superscripts are significantly different at *p* < 0.05 by Student's *t* test.

Table 2. Data of demographic, anthropometric, laboratory and dietary among subjects were ≤ 50 years, 51-70 years or > 70 years.

	≤ 50 years	51-70 years	> 70 years
BMI, kg/m ²	24.1 $\pm$ 0.7 ^a	23.4 $\pm$ 0.6 ^{ab}	21.7 $\pm$ 0.5 ^b
Male, n(%)	17(48.6)	17(48.6)	19(51.4)
Albumin, g/dl	4.1 $\pm$ 0.1 ^a	4.0 $\pm$ 0.1 ^{ab}	3.8 $\pm$ 0.1 ^b
GNRI	100.8 $\pm$ 1.2 ^a	99.5 $\pm$ 0.9 ^{ab}	95.9 $\pm$ 1.2 ^b
Hemoglobin, mg/dl	10.6 $\pm$ 0.3	10.6 $\pm$ 0.2	10.3 $\pm$ 0.2
Creatinine, mg/dl	13.0 $\pm$ 0.4 ^a	9.4 $\pm$ 0.4 ^b	8.9 $\pm$ 0.4 ^b
Potassium, mEq/L	4.9 $\pm$ 0.1 ^a	4.4 $\pm$ 0.1 ^b	4.5 $\pm$ 0.1 ^{ab}
Phosphate, mg/dl	5.8 $\pm$ 0.2 ^a	4.9 $\pm$ 0.2 ^b	4.7 $\pm$ 0.2 ^b
CaxPO ₄ , mg ² /dl ²	55.3 $\pm$ 2.5 ^a	45.3 $\pm$ 2.1 ^b	43.5 $\pm$ 1.9 ^b
Kt/V	1.64 $\pm$ 0.05	1.62 $\pm$ 0.05	1.63 $\pm$ 0.05
Dietary calorie, kcal/kg	23.1 $\pm$ 1.2	25.3 $\pm$ 1.5	24.7 $\pm$ 1.3
Dietary protein, g/kg	0.85 $\pm$ 0.1 ^b	1.00 $\pm$ 0.1 ^{ab}	1.05 $\pm$ 0.1 ^a

Variable are expressed as mean $\pm$ SE or number. BMI, body mass index; BUN, blood urea nitrogen; CaxPO₄, calcium phosphate product; GNRI, geriatric nutritional risk index; Values in the same column with different superscripts are significantly different at *p* < 0.05 by chi-square or ANOVA test.