Research Article

Prevalence of malnutrition in hemodialyzed chronic renal failure patients and its relation with the patient outcome

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Abstract
Malnutrition is a major issue in patients with chronic kidney disease (CKD), adversely affecting morbidity, mortality, functional activity and patients' quality of life. Our knowledge of the pathogenic mechanisms of malnutrition in patients with CKD, including endstage renal disease, has been improved. This has led to the development of clinical practice guidelines for nutritional care in CKD which provide a framework for the nutritional issues facing patients and physiccians. Extensive research in the field of nutrition in patients with CKD has resulted in the formation of general guidelines, although some uncertainties still exist on some of the best therapeutic or preventive options in uremic malnutrition. It is important to search actively for malnutrition since early diagnosis and treatment can improve the prognosis for CKD patients and reduce the monetary costs connected with treatment.
Keywords: Malnutrition, chronic renal failure, hemodialyzed

Introduction
Malnutrition is a major issue in patients with chronic kidney disease (CKD), adversely affecting morbidity, mortality, functional activity and patients' quality of life. Our knowledge of the pathogenic mechanisms of malnutrition in patients with CKD, including endstage renal disease, has been improved. This has led to the development of clinical practice guidelines for nutritional care in CKD which provide a framework for the nutritional issues facing patients and physiccians. Extensive research in the field of nutrition in patients with CKD has resulted in the formation of general guidelines, although some uncertainties still exist on some of the best therapeutic or preventive options in uremic malnutrition. It is important to search actively for malnutrition since early diagnosis and treatment can improve the prognosis for CKD patients and reduce the monetary costs connected withtreatment.

Malnutrition is usually defined as poor nutritional status resulting from poor nutrient intake. However, complex factors other than inadequate intake are the main cause of the nutritional and metabolic derangements in uremic patients. In these patients, serum and tissue proteins tend to be low despite dietary protein and energy intake that is based on standard nutritional guidelines [Pupim, L.B., Cuppari]**.** In addition, some CKD patients have low levels of protein stores regardless of their weight, with some actually being overweight. Although there is no totally adequate definition for such a status in CKD patients, "uremic malnutrition" is the commonly used term. [Stenvinkel, P., Heimbürger**].** Because of the many different diagnostic tools used in unrelated studies, the prevalence of malnutrition varies widely among different reports, ranging from 20% - 50% at different stages of CKD [Savica V., Santoro].

Once patients of chronic kidney disease have been shifted from pharmacological treatment to renal replacement therapy, the extent of malnutrition becomes more severe. One research work reported serum albumin concentrations of less than 3.7 g/dl in 25% of their patient population, which included more than 12,000 hemodialysis patients (Levey AS, Bosch JP, Lewis JB).

In the national cooperation dialysis study (NCDS), approximately 25% of patients on renal replacement therapy were found to have insufficient dietary protein and energy intake, as well as up to 40% of the patient population exhibiting levels in body fat and muscle index lower than those predicted by total-body nitrogen (TBN**)** (Jafar T, Schmid C, Lanada Mn, GiatrasI, Toto R, Remuzzi G).

Protein-energy malnutrition is a common feature in end- stage renal disease (ESRD) patients [Heimburger O, Qureshi], which becomes even more common after patients start on either peritoneal dialysis (PD) [Young GA, Kopple JD, Lindholm]. Although it is well established that malnutrition is one important predictor of survival in ESRD patients [Qureshi AR, Alvestrand], less is known about malnutrition and its impact on clinical outcomes in patients with a modest degree of chronic kidney disease. As noted by Mitch [Mitch WE.] the use of the word malnutrition has previously often been used incorrectly in the renal literature. Literally, the word "malnutrition", derived from Latin malus, means "not correctly nourished" and includes any disorder of nutrition (i.e. both under- and overnutrition). In the following text, we will therefore refer to cachexia, defined as a state of undernutrition deriving from both anorexia, i.e. insufficient food intake, and low serum protein levels and the loss of muscle mass as the result of a catabolic state. All of these factors occur in the ESRD patient, usually as the consequence of a number of interrelated mechanisms stimulated by renal insufficiency. Indeed, the aetiology of the cachexia in ESRD is very complex and may include numerous factors including loss of appetite, delayed gastric emptying, impaired protein assimilation, hormonal derangements, inadequate control of acidosis, co-morbidity, inflammation, depression and other psycho-social factors **[**Mitch WE.].

Therefore, it is not likely that wasting in ESRD can be adequately treated by only one single therapy; instead we propose the concept of an integrated therapy of wasting consisting of both dietary and pharmacological components .

Aim of the study

1- Estimate the effect of malnutrition in end stage renal disease patients on hemo-dialysis.
2- Relation between malnutrition & serum level of albumin; total cholesterol & transferrin and arm circumference in end stage renal disease patients on hemodia-lysis.

Patients and Method

We will study patients undergoing maintenance hemodialysis more than three months divided into two groups; group A patients with malnutrition, and group B patients with normal nutrition .

Inclusion criteria:

* Chronic renal failure patients on hemodialysis more than three months
* Age group 18-60

Exclusion criteria:

* Inflammatory bowel disease.
* Decompencated liver disease.
* Malignancy.
*chronic renal failure patients on hemodialysis less than three months

Method:

1- History (age, anorexia, protien diet, Epigastric pain, constipation, diahrea)
2- Full clinical examination (general and systemic examination)
3- The blood sample will be tested for:
*serum albumin
*total protein
*total cholesterol
*Transferrine
*BUN (Blood urea nitrogen)
*Renal function tests (urea, creatinine)
*Complete blood count
*Liver function tests (ALT, AST)
*serum calcium
*Phosphate
*PTH
4- Estimate BMI
5- Arm circumferernce

Results

		Normal nutrition N=99	Malnutrition N=66	P value
Age	*Range* *Mean ± SD*	(19-78) 52.4±14.1	(21-83) 46.8±17.3	***0.030****
Sex	*Male* *Female*	51(51.5%) 48(48.5%)	32(48.5%) 34(51.5%)	*0.703*
BMI	*Range* *Mean ± SD*	(22.4-44.9) 30.1±4.9	(17-18.5) 17.9±0.4	***<0.001****
Arm circumference	*Range* *Mean ± SD*	(25-38) 31.1±2.8	(20-23) 22.3±0.8	***<0.001****
Duration of dialysis	*Range* *Mean ± SD* *Median*	(0.5-15) 4.5±4 3	(1-30) 6.6±5.5 6	***0.003****
HCV	*-Ve* *+Ve*	54(54.5%) 45(45.5%)	31(47%) 35(53%)	*0.340*
Protein diet restriction	*No* *Yes*	53(53.5%) 46(46.5%)	22(33.3%) 44(66.7%)	***0.011****
Bowel habits	*Normal* *Constipation* *Diarrhea*	84(84.8%) 14(14.1%) 1(1%)	57(86.4%) 6(9.1%) 3(4.5%)	*0.214*
SBP	*Range* *Mean ± SD*	(90-170) 126.1±16.9	(90-180) 125±20.5	*0.728*
DBP	*Range* *Mean ± SD*	(60-100) 80.4±8.7	(50-100) 79.1±11.1	*0.418*

- **Independent samples T test for parametric quantitative data between the two groups**
- **Mann Whitney test for non-parametric quantitative data (expressed as median) between the two groups**
- **Chi square test (if expected value pre cell > 5) and Fisher exact test (if expected value per cell < 5) for qualitative data between the two groups**
- ***: Significant difference at P value < 0.05**

		Normal nutrition N=99	Malnutrition N=66	P value
Urea before dialysis	*Range* *Mean ± SD*	(118-148) 133.1±6.2	(116-148) 131.6±6.9	*0.150*
Urea after D.	*Range* *Mean ± SD*	(55-96) 66.3±5.9	(56-77) 64.9±5.1	*0.110*
BUN	*Range* *Mean ± SD*	(56-74) 66.2±3.3	(58-74) 65.8±3.5	*0.392*
Creatinine	*Range* *Mean ± SD*	(4.5-6.5) 5.7±0.4	(4.55-6.3) 5.1±0.4	***<0.001****
URR	*Range* *Mean ± SD*	(40.6-58.3) 50.3±3.4	(41.4-56.8) 50.6±3.3	*0.523*
Residual renal function	*Range* *Mean ± SD* *Median*	(30-1000) 237.7±233.7 100	(50-1500) 165.2±203.6 100	***0.048****

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Discussion

The pathogenic mechanisms of malnutrition in heamodialyzed patients are complex and involve an interplay of multiple pathophysiologic alterations including decreased appetite and nutrient intake, hormonal derangements, metabolic imbalances, inflammation, increased catabolism, and dialysis related abnormalities. Malnutrition increases the risk of morbidity, mortality and overall disease burden in these patients. (Franca, 2018).

The prevalence of malnutrition in the population studied varied a lot (from 12.1% to 94.8%), depending on the method used for diagnosis.

Our study shows high prevalence of malnutrition in the patients of hemodialysis unit in Minia university (40%) in comparison with other studies as in Morocco prevalence of malnutrition among patients on hemodialysis was (29%) (Kadri et al., 2012).

Malnutrition was significantly higher in elderly CKD patients compared to younger and middle aged patients in this study. This finding was similar to (Franca, 2018).

This pattern is not surprising because aging is associated with malnutrition in the elderly even without renal failure (Hickson M, 2016)

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