SERUM AMINO ACIDS BEFORE AND AFTER ORAL SUPPLEMENTATION IN HEMODIALYSIS PATIENTS FP785

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OBJECTIVES

Protein-energy wasting is still a problem in patients with chronic kidney disease, especially during replacement renal therapy.Variations in serum amino acids (AA) patterns in relation to malnutrition and metabolic disturbances are often observed in dialysis patients.
The recent studies showed that the concentration of essential and non-essential AA is a good indicator of protein metabolism abnormalities. In dialysis patients both the plasma essential AA concentration and the ratio of essential AA to non-essential AA get decreased. Characteristic for these patients is serum decrease of tryptophan (TRP), tyrosine (TYR), histidine (HIS) and valine (VAL) and also the increase of sulphur AA.

The aim of the study was to determine serum concentration of amino acids (AA) before and after oral supplementation in malnourished hemodialysis (HD) patients.

METHODS

To study the influence of oral supplementation on amino acids profile and nutrition status; 30 hemodialysis patients with protein-energy malnutrition characteristics were enrolled in the study. Malnourished hemodialysis patients were prescribed Renilon 7.5 at an oral intake dose of 125 mL twice a day for three months.
The nutritional status was characterized based on:
-body mass index (BMI),
-Subjective Global Assessment (SGA)
- serum albumin and prealbumin concentrations.
The body composition was measured by BIA method (BCM Fresenius SA). The adequacy of dialysis treatment was estimated by Kt/V.

Serum concentration of 22 amino acids (AA) was measured by OPA precolumn derivatization method on Hitachi–Merck HPLC equipped with C-18 reversed phase column and methanol/acetate buffer gradient.

The basic characteristic of the studied group

PARAMETERS	HEMODIALYSIS PATIENTS n=30
Age (years)	57.3 ± 16.6
M/F	13/17
BMI (kg/m^2)	26.5 ± 4.3
Kt/V (per one dialysis session)	1.3 ± 0.1
Diabetes mellitus	n=9

RESULTS

AMINO ACIDS PROFILE

The mean concentration of the sum of amino acid before supplementation was 222.5 [nmol / 100µL], and after increased to 232.9 [nmol / 100µL]. The increase was not statistically significant. After 3 months of supplementation increased of histidine, glutamic acid, ornithine, serine, arginine, asparagine, aspartic acid, threonine (see Table), and decreased of glutamine, glycine, methionine, thryptophan and aABA was observed. Statistical analysis showed no relationship between AA concentrations and nutritional status, BMI, inflammation or dialysis adequacy. Statistically significant ($p < 0.05$) relationship was observed for lean body mass and histidine ($r = -0.43$),tryptophan ($r = -0.49$) and taurine content ($r = -0.43$).

The concentration of selected AA after oral supplementation

AA	BEFORE supplementation	AFTER supplementation	p
SUM OF AA	222.5	232.9	0.12
HIS	4.8 ± 0.6	4.7 ± 0.6	0.01
GLN	9.4 ± 3.4	17.8 ± 5.7	0.01
ORN	7.9 ± 4.3	15.8 ± 5.9	0.01
ARG	7.8 ± 3.2	10.3 ± 3.6	0.05
ASP	5.1 ± 1.7	6.0 ± 1.3	0.05
ASN	1.5 ± 0.5	2.2 ± 0.6	0.05
THR	2.2 ± 1.8	5.0 ± 2.1	0.01
SER	5.8 ± 2.4	8.9 ± 9.8	0.00

NUTRTIONAL STATUS

Upon SGA examination after three months, the mean SGA values were the same. However, an improvement in appetite level was noticed in 11 patients (40,7%). After three months of supplementation, malnourished patients had an increase in prealbumin and albumin concentration
Anthropometric parameters (body weight, BMI, LBM and %F) were stable during the observation period

The markers of nutritional status after oral supplementation

Parameters	BEFORE supplementation	AFTER supplementation	p
SGA (points)	4.8 ±0.6	4.7 ±0.6	0.67
nPCR (g/kg/d)	0.93±0.2	1.04 ±0.2	0.07
BMI	23.7 ± 3.8	24.1 ± 3.7	0.72
Albumin (g/dl)	36.9 ± 2.3	38.3 ±.4.0	0.02
Prealbumin (mg/dl)	6.9 ± 8.8	12.6 ± 8.1	0.03

CONCLUSIONS

The results indicate an improvement in the nutritional status of hemodialysis patients prescribed an oral supplementation.
Improving the concentrations of amino acids may result from the supply supplement and may be associated with the presence of a mixture of several compounds in the preparation Renilon 7.5 which could indirectly increase the bioavailability of histidine, glutamic acid and ornithine supplied from the diet.

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