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EFFECT OF EPA ETHYL ESTER ON FATTY ACID PROFILE IN HEMODIALYSIS PATIENTS WITH LOW EPA/AA RATIO

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Background: Large amounts of n-3 polyunsaturated fatty acids are known to lower the risk of cardiovascular events (CVE). Serum eicosapentaenoic acid (EPA) / arachidonic acid (AA) ratio may potentially be a predictor of CVE which is the most common cause of death in hemodialysis (HD) patients. Therefore, we estimated the effect of EPA ethyl ester on fatty acid profile in HD patients.
Subjects & Methods: Fatty acid profile and high sensitivity CRP (hs-CRP) were measured in 131 patients receiving maintenance HD. Among these, 64 patients (F:M=25:39) with both low EPA/AA ratio (≦0.4) and negative CRP were enrolled in this randomized study (Group A, EPA administrated group, n=30; Group B, EPA non-administrated group, n=34). The mean age of the patients was 66.5 ± 11.9 years old and the duration of HD was 8.4 ± 7.9 years. The serum levels of EPA, AA, docosahexaenoic acid (DHA), and dihomogammalinolenic acid (DHL-A) were measured by gas chromatography (SRL, Tokyo, Japan).
Results: The mean levels of EPA/AA ratio, DHA/AA ratio, DHL-A, non HDL-C and GNRI (Geriatric Nutritional Risk Index) were 0.28 ± 0.13, 0.62 ± 0.15, 22.7 ± 8.4 μg/ml, 112.2 ± 31.0 mg/dl and 93.6 ± 5.5, respectively. After one month of treatment with EPA in group A, EPA/AA ratio was significantly increased (0.30 ± 0.15 vs. 0.95 ± 0.45, $p < 0.0001$) and DHL-A significantly decreased (22.7 ± 7.4 vs. 15.7 ± 6.8, $p = 0.0003$), but DHA/AA ratio, serum non HDL-C and phosphate levels did not change. EPA/AA ratio was significantly higher and DHL-A lower in group A compared with group B after one month of the start of study.
Conclusions: Medication of EPA for one month increases EPA/AA ratio, and decreases DHL-A level without the change of serum phosphate level in HD patients with low EPA/AA ratio.

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ASSOCIATION OF CALCIFEDIOL LEVELS WITH VERTEBRAL FRACTURES, VASCULAR CALCIFICATIONS AND MORTALITY.

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The best biomarker of Vitamin D status is calcifediol [25(OH)D]. We investigated the relationship between serum calcifediol levels and vertebral fractures (VF), vascular calcifications (VC) and mortality in hemodialysis patients. Within a multicenter, cross-sectional study in 18 hospital based dialysis centers in Italy, we included 387 hemodialysis patients (143 F, 37% ; 244 M, 63%), mean age 64 ± 14 (SD) years, median dialytic age 49 months, BMI 25 ± 4 Kg/m^2. We determined total 25(OH)D using the LIASON® 25 OH Vitamin D kit (DiaSorin Inc., Stillwater MN, USA). We evaluated VF with a computerized analysis of scanned L-L vertebral X-rays (T4 to L5). Reduction of > 20% of vertebral body height was considered a VF, while reductions between 15% and 20% were considered borderline fractures (BF). Fracture severity was estimated as mild, moderate or severe (reduction: 20–25%, 25–40% or >40%, respectively). VC assessments were also centralized. Witteman's method (Lancet, 1994) was used for blinded assessments in duplicate. VC were quantified by measuring the length of calcific deposits along the anterior and posterior wall of the aorta (mild 0.1-5 cm, moderate 5.1-10 cm and severe >10 cm). We also evaluated the presence or absence of calcifications of the iliac arteries in the same radiograph (mild 0.1-3 cm, moderate 3.1-5 cm and severe >5cm). Any differences in VC were resolved by consensus. Follow up was 2.7 ± 0.5 years.

Bone markers were: Ca 9.15 ± 0.68 mg/dl, P 4.8 ± 1.28 mg/dl, median ALP 83 U/L and median PTH 244 pg/ml. We found a median 25(OH)D level of 28.9 ng/ml. Nine (2.3%) patients had vitamin D deficiency (< 10 ng/ml), 198 (51.2%) patients had vitamin D insufficiency (between 10-29.9 ng/ml) and 180 (46.5%) patients had normal levels (>30 ng/ml). We found that 55% of patients had VF and 30.9% of patients had BF. Prevalence of VC was 80.6% (mild 20.1%, moderate 30.8%, severe 29.7%) in the aorta and 55,1% in the iliac arteries. Males had more VF than Females (60% versus 48%, P=0.019). No associations were found between VF and biochemical parameters including calcifediol levels (p=0.662), while we found an association between low calcifediol levels and a higher prevalence of severe aortic calcifications (36.8 *vs* 28.2, p=0.0044). Furthermore, we found a OR 1.85 (1.04-3.29 CI, p=0.0367) for Aortic Calcification in patients with calcifediol levels lower than the median value of 29 ng/ml. During follow-up (2.7 ± 0.5 years) mortality was of 19.9%. No association was found between mortality and calcifediol levels (p=0.5394). In conclusion, despite good control of bone and mineral metabolism parameters, hemodialysis patients showed high prevalence of VF and VC. Our study suggests that high calcifediol levels could be protective against progression of severe aortic calcification

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KETO-ANALOGUES IN PRE-DIALYSIS CHRONIC KIDNEY DISEASE PATIENTS: REVIEW OF OLD AND NEW DATA

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Recently revealed high prevalence of Chronic Kidney Disease (CKD) raises concerns all over the world; evidence based strategies to delay progression were set up. Dietary approach is largely mentioned, but strong evidence is lacking.

The reduced dietary protein intake has been reported for more than a century to improve uremic symptoms and even to postpone the initiation of renal replacement therapy (RRT); however, the nutritional intervention in uremia is still under debate.

Different dietary protein regimens have been proposed for the CKD patients: (1) conventional low protein diet (LPD), with 0.6 g/kg per day; (2) very low protein diet (0.3 g/kg per day) supplemented with essential amino acids or (3) very low protein diet (0.3 g/kg per day) supplemented with an isomolar mixture of essential amino acids and nitrogen-free keto-analogues (SVLPD).

Available data support SVLPD to be effective in ameliorating nitrogen waste products retention, acid-base and calcium-phosphorus metabolism disturbances and insulin-resistance and in delaying the RRT initiation, with no deleterious effect on the nutritional status in CKD patients.More recent studies report that SVLPD could also slow down the rate of decline in renal function, preserving the nutritional status and associating better outcome after the start of RRT.

The possible delay of RRT initiation through nutrition could have major impact on patients' quality of life. On the other hand, postponing RRT could have also a serious economic impact, particularly important in countries where the dialysis facilities still do not meet the needs. The nutritional intervention, particularly the SVLPD could be a new link in the RRT integrated care model.

However, a careful selection of motivated patients who could benefit from such a diet, close nutritional monitoring and dietary counseling are highly required.

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NUTRITIONAL STATUS AND INTAKE PATTERN IN A GROUP OF ESRD SPANISH PATIENTS

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Introduction: The nutritional status of the ESRD patients is a crucial issue in the disease progression, that's the reason why the patient nutritional education is so important.Our objective is to evaluate the change in the nutritional status in a group of ESRD patients after a personalized nutritional education program. Method Longitudinal case study of 103 patients who took part in a nutritional educational program over six months (personalized diet, education and oral supplementation).
Results: See below Table 1.

Table 1.

	WELL-NOURISHED		UNDERNOURISHED	
	Before	**After**	**Before**	**After**
N(%)	58,3%	79,6%	41,7%	20,4%
Albumin (g/dl)	3,79 ± 0,2	3,79 ± 0,3	**3,3 ± 0,5**	**3,5 ± 0,4***
Prealbumin (mg/dl)	32,86 ± 5,2	33,85 ± 5,6	28,1 ± 5,2	28,6 ± 3,3
Potassium	4,8 ± 0,7	**4,6 ± 0,4***	4,8 ± 0.67	4,6 ± 0,5
Cholesterol (mg/dl)	181,6 ± 50,72	**167,02 ± 41,02***	177,37 ± 38,8	175,1 ± 37,1
Energy intake (kcal)	**1859,0 ± 324,1**	**1571,5 ± 219****	1794,1 ± 482,1	1797,7 ± 414,3
Protein intake(g)	**69,7 ± 15,3**	**55,6 ± 12,8, ****	**69,7 ± 18,3**	**54,26 ± 10,6, ****
Weight (kg)	**77,5 ± 12,3**	**74,2 ± 11, ****	65,7 ± 13,9	65,6 ± 12,4
BMI	**29,3 ± 4,5**	**28,1 ± 4,1, ****	25,76 ± 5,17	25,75 ± 4,6

Conclusion: The undernourished patients percentage (reflected by the albumin and prealbumin increase) decrease after the nutritional program. The well-nourished patients drop his weight and protein intake

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TOTAL BODY WATER DETERMINATION: HAVE WE TO ADAPT ITS DETERMINATION TO THE PATIENT CLINICAL STATUS?

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Introduction: The correct assessment of the total body water (TBW) is a crucial issue of the renal replacement therapy due to it represents the urea distribution volume, used for the determination of the dialysis adequacy Kt/V. Our objective was to study the correlation between the TBW estimated by Watson formula and with BCM-body composition monitor (Fresenius Medical care®).

Methods: We study all the patients in hemodialysis in the Hospital La Paz Unit and Madrid El Pilar center, before the dialysis treatments.

Results:

Weight (kg)	70,05 ± 13,12	**ICW(l)**	16,02 ± 3,73
BMI(kg/ m2)	26,86 ± 9,8	**Albumin(g/dl)**	3,87 ± 0,48
FM(%)	37,97 ± 10,52	**Prealbumin (g/dl)**	28,22 ± 8,18
FFM(%)	43,09 ± 12,54	**CRP**	11,34 ± 23
ECW(l)	16,8 ± 3,51	**TBW w(l)**	35,76 ± 6,15
		TBW bcm(l)	32,92 ± 7,31

Regarding the nutritional status, a 36.8% patients were undernourished by Chang criteria (19.3% sleigh, 15.8 % moderately and 1.8% severely). A 50.9% were obese by the %MG and a 61.4% had some criteria of muscle atrophy. We analyze the TBW differences by linear regression, adjusted by: BMI R2 = 0,076 p = 0,038, %FFM R2 = 0,553 p < 0,001, % FM R2 = 0,615 p < 0,001 y CRP R2 = 0,228 NS.

Conclusion: There is a good concordance between both methods in the determination of the TBW. The Watson formula overestimates the TBW in patients with high %FM and underestimates in those with high FFM. In the clinical practice, it is necessary to adapt the determination of TBW to the patient situation.

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HANDGRIP STRENGTH AS A SIMPLE INDICATOR OF MALNUTRITION IN HEMODIALYSIS PATIENTS

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Background: Handgrip strength is a simple, easily performed bedside test that has been shown to correlate with lean body mass in patients close to inception of dialysis.

Objective: To assess the usefulness of handgrip strength (HGS) as a simple screening instrument for assessing malnutrition among patients on Maintenance Hemodialysis and correlate it with Subjective Global Assessment score (SGA).

Methods: 50 subjects on Maintenance Hemodialysis were randomly assessed using SGA scores and their Hand Grip Strength using the HGS instrument once after the dialysis.

Results: The study comprised of subjects in 3 different stages of CKD, stage III (22%), stage IV (44%), stage V (34%) among which 78% (39) were men with mean age of 51.46 ± 13.21yr and 22% (11) were women with mean age of 60.36 ± 14.62yr. The SGA classification showed that all the subjects (6) in severely malnourished category were of stage V whereas Very mild risk to well nourished category (15) comprised of stage III and IV. Similarly, the HGS scores were found to be 25.18 ± 5.036 kg and 18.87 ± 5.365 kg in CKD stage III and CKD stage V respectively. HGS was found to be directly correlated with SGA score, with statistical significance of $p < 0.01$.

Conclusion: HGS is a complementary tool for screening malnutrition in patients on Maintenance Hemodialysis.

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USING SECOND LIFE VIRTUAL COMPUTER WORLD AS A TRAINING TOOL FOR THE SUBJECTIVE GLOBAL ASSESSMENT (SGA).

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The SGA is a clinical tool used to assess protein energy wasting. Although well validated, it is still not widely incorporated into clinical practice. A barrier to use may be the physical assessment section. Therefore, the purpose of this project was to develop a free and effective tool to train clinicians on performing the SGA. Second Life (SL) is a free virtual reality program accessed through the internet using human-like "avatars." A museum environment was created with panels presenting SGA background information through text, images, and videos of SGA being performed. Users are able to navigate the information by logging onto a provided avatar. After the initial panels, this avatar is able to interact with avatar bots and perform animations which mimic each body assessment within the SGA. Two trial periods were conducted to assess the efficacy of this training tool. The alpha trial consisted of 3 hospital dietitians and 3 nutrition students. These subjects came to the investigators' facility to test the program. Subjective responses were collected and used to improve the training tool. Feedback was positive regarding the information, delivery, and direction of the project; however, they did complain of difficulty with controlling the avatar. The beta trial consists of users accessing the module remotely. These users include academic and clinical dietitians. Responses are being collected via 5 surveys covering each portion of the module. While 16 dietitians responded to the beta trial, only 4 have completed the training. Current survey responses state: the use of SL is easy and enjoyable; all SGA information was clear and in a desirable format; tactile comparison objects were beneficial for understanding; the in depth description of each assessment is beneficial; the animations that the avatars perform on the bots needs improvement; a patient avatar on which users could perform the full SGA is desirable; the use of SL in the learning process is beneficial, but it can also be distracting; the module increased the users' familiarity, confidence, and desire to employ the SGA, amongst both current users and those new to the SGA. In summary, this training tool provides clinicians a free and effective way to learn the SGA.

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