Posters

Body composition

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TEN YEAR CHANGES IN ANTHROPOMETRIC CHARACTERISTICS OF ELDERLY EUROPEANS

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Objective: Assess longitudinal changes in height, body weight and circumferences in elderly Europeans.

Design: Longitudinal study including baseline measurements taken in 1988/1989 which were repeated in 1999.

Methods: Baseline and finale data were collected in 10 European research towns: Hamme/B, Roskilde/DK, Haguenau/F, Romans/F, Padua/I, Culemborg/NL, Vila Franca de Xira/P, Betanzos/E, Yverdon/CH, Marki/PL.

Using standardized methodologies data were collected from a random stratified sample of elderly men and women born between 1913 and 1918 including a total of 662 subjects in 1999.

Results and conclusion: At most sites stature had decreased by 1-2 cm. Mean weight changed by –1.2± 6.0 kg in men and by –1.7± 6.3 kg in women. Average serial changes in circumferences differed. Mean arm circumference slightly decreased over time, whilst circumferences of waist and hip increased. The meaning of these changes in relation to health and survival requires further analysis.

So far preliminary findings revealed increased mortality in underweight elderly SENECA participants.

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GEOGRAPHICAL VARIABILITY IN ANTHROPOMETRIC MEASURES IN ITALIAN ELDERLY. RESULTS FROM ILSA (ITALIAN LONGITUDINAL STUDY ON AGING)

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The aim of the study was to evaluate differences in anthropometric data for nutritional assessment in Italy. We used the cross sectional phase of a multicentre longitudinal study on ageing (ILSA by CNR). A sample of 5462 subjects aged 65-85 years was randomly selected from eight municipalities, representing North, Centre and South of Italy. For 3356 subjects (62%), besides information about health status, anthropometric measures were reported. All measures were described by sex and age groups. A sex and geographic location specific description was also performed. The comparison between anthropometric characteristics of our subjects and those of European population confirmed older Italians are in the middle or lower part of the distribution. Mean weight (kg) ranged between 74.6 (± 11.2) in the younger and 66.7 (± 10.7) in the older for men. In women the mean weight ranged from 66.2 (± 12.0) to 60.0 (± 11.7). Stature (cm) varied between 167.1 (± 7.5) and 162.7 (± 7.2) for men; in women the range was from 154.1 (± 6.7) to 149.3 (± 7.0). Mean BMI (kg/m^2) varied from 26.7 (± 4.2) to 25.2 (± 3.6) for men and from 28.0 (± 5.2) to 27.1 (± 5.8) for women. All the anthropometric measures significantly differed among the eight Italian municipalities in each sex. Stature showed a similar geographic trend from North to South both in men (169.0± 7.3 to 161.7± 6.6) and in women (156.8± 6.7 to 148.1± 5.7). Prevalence of undernutrition (BMI≤ 20) varied from 1.5% to 5.0% for men, and from 1.5% to 9.6% for women. Obesity prevalence (BMI≥ 30) ranged from 10.9% to 21.9% for men and from 17.7% to 45.5% for women. The geographical variations observed suggest that national reference data for nutritional assessment might be not representative of all populations.

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EVALUATION OF THE NUTRITIONAL STATUS IN CHRONIC HYPOXEMIC ELDERLY PATIENTS

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The purpose was to evaluate nutritional status in chronic hypoxemic patients from the Vega Baja Hospital, Alicante, Spain, who were ambulatory and clinically stable. Subjects consisted of 42 male patients, mean age 69± 10 yrs, with some type of ventilatory support. Hematological and anthropometric parameters were measured.

TP (g/dl)	*AL (g/dl)*	*TF (mg/dl)*	*CT (mg/dl)*
7.66± 0.33	3.96± 0.27	304± 69	1.07± 0.15
Height (cm)	*Weight (kg)*	*BMI (kg/m^2)*	*TS (mm)*
163± 7	79± 15	29.7± 5.6	20.47± 9.34

The results indicate that total proteins (TP), albumin (AL), creatinine (CT) and transferrine (TF) were normal and that undernutrition in the protein-visceral compartment was not present. Furthermore, upon analyzing anthropometric data, this population could be defined as overweight (BMI > 27 kg/m^2) and obese, according to triceps skinfold data of the Spanish population (> 95th percentile).

Taking into account that underweight and overweight patients are both considered malnourished, some by deficit and other by excess, it is concluded that, contrary to the conclusions of prior studies, patients from the Vega Baja Hospital from the south of Spain are not undernourished, but rather are malnourished because of overweight and obesity.

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BODY FAT DISTRIBUTION IN PRE- AND POST-MENOPAUSAL WOMEN: METABOLIC AND ANTHROPOMETRIC VARIABLES

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The aim of the study was to compare body fat distribution and metabolic variables in pre- and post-menopausal women. The study was conducted in 55 obese female subjects (22 pre- and 33 post-menopausal) with body mass indices (BMI) from 27 to 35 kg/m^2. Body fat distribution was measured using waist and hip circumference and computerized tomography. Hormones such as estradiol, testosterone, androstenedione, dehydroepiandrosterone, insulin and leptin, as well as plasma lipids as triglycerols, total cholesterol, HDL-C, LDL-C, apoprotein A and B, were also determined. No significant differences were found between the two groups in BMI, percentage of body fat, waist circumference, triceps, biceps, suprailiac and abdominal skinfolds. Hip circumference, subscapular skinfold and subcutaneous abdominal adipose tissue area were significantly lower and waist-hip ratio, visceral area and visceral to subcutaneous area ratios significantly higher in post-menopausal women (P< 0.001). As was expected, basal plasma estrogen was significantly higher in pre-menopausal women, while insulin was lower (P< 0.01). When comparing plasma lipids, blood cholesterol and LDL-C values were significantly higher in the post-menopausal group (P< 0.05). In conclusion our data suggest that body fat distribution changes according to menopausal status, with central obesity more pronounced in post-menopausal women. Metabolic abnormalities are related more to visceral adipose tissue and estrogen plasma levels than to BMI.

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OVERWEIGHT IN ELDERLY MEXICAN WOMEN OF A MARGINAL COMMUNITY

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Obesity is a main risk factor in the development of diseases which are causes of death in elderly population. Socio-economic characteristics had an impact in the prevalence of obesity. The purpose of this study was to estimate the prevalence of obesity in elderly Mexican women living in a marginal community and compare their results with those of women of urban and rural areas in Mexico. The study has a cross sectional design. The measurements were carried out by standardised nutritionist. The international techniques recommended were used to measure weight and height. To estimate the proportion of overweight and obesity, the body mass index (BMI) was used following the WHO categories. A total of 249 elderly women were examined. The mean age was 71.6 (sd 7.8). No difference in age was found in the three communities visited (p< 0.05). The mean BMI in the urban women was 26.7 (sd 4.6), in the rural 24.5 (sd 3.9), and in the marginal group 28.6 (sd 5.5) (p< 0.0001). The proportion of overweight and obese women was in the urban group 60.7%, in the rural 36.2% and in the marginal women 76.5% (p< 0.0001). The results of this study indicated the presence of a high prevalence of overweight and obesity in elderly women of urban and particularly in the marginal areas. Marginality seams to be a risk marker of obesity in elderly women in Mexico. Intervention programs aimed to decrease the prevalence of obesity and improve nutritional condition in this group are urgent.

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MINI NUTRITIONAL ASSESSMENT IN FREE-LIVING AND INSTITUTIONALIZED SWEDISH ELDERLY

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Objectives: The nutritional status in free-living elderly with home help service (FHHS) and with home nursing care (FHNC), and in elderly in assisted accomadations, i.e. service flats (SF), old peoples homes (OPH), group living for demented (GLD) and nursing homes (NH) was studied.

Methods: Out of 1589 subjects, 1308 were assessed according to the Mini Nutritional Assessment (MNA) scale (0-30 points), which consists of 18 point-weighted registrations, e.g. body mass index (BMI, kg/m^2).

Results: The average age in the populations ranged from 82± 7 to 84.5± 8 years. The table shows the percentage malnourished, risk for malnutrition and well-nourished subjects in the various populations.

MNA	*FHHS (n= 356)*	*FHNC (80)*	*SF (349)*	*OPH (261)*	*GLD (96)*	*NH (166)*
< 17 (malnourished)	6	3	21	33	39	71
17-23.5 (risk for maln.)	43	62	49	57	51	29
≥ 24 (well-nourished)	51	35	30	10	10	0

BMI < 20 was found in 15-34% of free-living elderly and in 18-33% of those in assisted housing.

Discussion: More than half of the elderly with various forms of community support were assessed as having suspected or confirmed malnutrition. Further studies are necessary to assess to what extent these nutritional disturbances are reversible.

Nutritional routines in old peoples care within the community may need more focus.

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CHANGES IN BODY COMPOSITION DURING ELDERLY

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Body composition is crucial to evaluate nutritional status. The aim of the present work was to assess changes in body composition during elderly, in both males and females.

The study was carried out in 54 institutionalized old persons (18 males and 36 females). Weight was measured using an electronic weighing scale, height using a stadiometer, arm circumference (AC) using an antrophometric tape and tricipital (TS) and abdominal (AS) skinfold thickness using a Holtain caliper. Arm muscle circumference (AMC) and total body fat (TBF; %) were calculated according to Frisancho and Durning & Womersley respectively.

	Males		*Females*	
	65-79 y (n= 6)	*+79 y (n= 12)*	*65-79 y (n= 13)*	*+79 y (n= 23)*
Weight (kg)	72,5± 16,0	64,2± 8,8	64,0± 6,1	62,6± 9,5
Height (m)	1,64± 0,07	1,60± 0,05	1,47± 0,05#	1,48± 0,05#
TS (mm)	13,63± 8,14	10,83± 3,30	22,93± 5,88#	19,05± 5,14*#
AT (mm)	18,00± 7,88	18,08± 7,29	25,77± 7,00#	24,30± 4,61#
TBF (%)	29,14± 8,86	28,05± 3,99	38,51± 3,92#	35,53± 4,01*#
AC (cm)	30,77± 4,99	27,11± 2,35	30,39± 2,16	28,67± 2,78
AMC (cm)	26,49± 3,19	23,71± 1,72*	23,66± 1,89#	22,69± 2,26

Significantly different from males; * Significantly different from people aged 65-79 years, P< 0.05

When comparing females aged more than 79 years with those aged 65-79 years a significant decrease in total body fat, due to peripheral fat but not to central fat, was observed. In males total body fat was maintained but muscular mass was reduced, reaching similar values than those shown by females aged more than 79 years.

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NUTRITIONAL CHARACTERIZATION OF INSTITUTIONALIZED VENEZUELAN ELDERLY

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In order to characterize anthropometrical and biochemical variables of elderly population, according to age, sex, and nutritional status, 31 men and 32 women, aged 60 or more years (77.2± 7.4 y), from a geriatric home from Valencia, Venezuela, were evaluated.

Weight, height, circumferences (AC), skinfolds (TSK), fat area (FA), muscle area (MA), and body mass index (BMI) were determined. Hemoglobin, lymphocyte count, albumin, transferrin and serum cholesterol were measured. According to age, two groups were built: < 80 y and > 80 y. By BMI, three groups were identified: low weight: < 22.0, normal: 22.0 a 26,9 and overweight: ≥ 27.0 kg/m^2. Descriptives statistics, student t test and ANOVA were performed.

60.3% of the elderly were < 80 y old, and 47.3% were male, while 39.7% of the elderly were older than 80 y and 52% were male, with no significant differences in distribution by sex. 32% of the elderly were classified as low weight and 38% as overweight, with 75% of male as low weight and 79% of women as overweight (Chi^2:13.6, p< 0.001). Men had significantly lower values of BMI, AC, TSK and FA (p< 0.001). Proportion of elderly with abnormal biochemical parameters were 9.5% for hemoglobin, 9.5% for lymphocyte count, 31.7% for albumin and 17.4% for cholesterol and transferrin respectively.

These results show the great variability among anthropometric and biochemical variables, indicating that as aging advances, nutritional risk increases. More research is needed in this area with the aim of obtaining representative information on this population group.

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WEIGHT REPRESENTATION IN ELDERLY

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In the present study we have examined how elderly and non-elderly subjects evaluate their weight. The subjects were divided in four groups: overweight elderly, obese elderly, overweight non-elderly and obese non-elderly. Subjects were asked to refer both their height and weight. By using these values we calculated the referred BMI (rBMI). The rBMI was confronted with the real BMI (BMI).

The subjects were also required to indicate which weight they hoped to reach. By using this last value we calculated the desired BMI (dBMI). The results showed that rBMI was significantly lesser than BMI in all the groups. However no diferences in underestimation were found among the groups. As to dBMI, the 50% of overweight elderly and 85% of overweight non-elderly desired to reach a normal weight; and 12% of obese elderly and 43% of obese non-elderly desired to reach a normal weight. These findings suggest that normal weight represent more frequently the target to reach in non-elderly than in elderly.

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MENOPAUSE: HORMONAL REVOLUTION OR FEMALE ELDERLY START?

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Objective: To evaluate body composition in fertile and menopause women.

Patients: 100 healthy women were selected; then women were divided into two groups: fertile (50; mean age 47.7± 4.8 and menopause (50; mean age 47.0± 5.0). The groups had smilar BMI (28.3± 0.2) and weight (68.3± 0.2 Kg).

Methods: Our data were homogeneous in every group. We observe a different body composition between fertile then menopausal group; the mean total water, in fact appears higher in fertile than menopausal group (32.9 Kg vs 32.4 Kg); of greater interest seems to be water distribution between intracellular and extracellular compartment: the intracellular compartment in fertile group is higher than menopausal group (20.2 Kg vs 19.1 Kg), while the extracellular was less (12.7 Kg vs 13.3 Kg). The intra/extracellular water ratio was higher in menopausal than in fertile group (23.7 Kg vs 23.2 Kg). The lean mass, cellular mass and muscle mass were reduced in menopausal group than in fertile group.

Discussion: We suppose the different water compartimentation in fertile and menopausal group was related to cell wall and/or receptorial system modification to sex hormone.

We also believe that different water distribution in fat and lean body compartment at menopausal time was hormone-related. Our data point out that there is a relevant modification of the female body from the fertile status to menopausal passing throw a perimenopausal condition distinguished by dramatic change of cell membrane.

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AUSTRALIAN LONGITUDINAL STUDY OF AGEING: I. PROSPECTIVE EVALUATION OF ANTHROPOMETRIC INDICES IN TERMS OF MORTALITY IN COMMUNITY-LIVING OLDER ADULTS

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The Australian Longitudinal Study of Ageing (ALSA) aims to identify factors that contribute to & predict the health & social well-being of older Australians. Analyses were performed to determine the predctive value of anthropometric measurements in older Australians for 4-year mortality.

Weight, height, skinfolds (triceps, abdominal, supra-spinale, sub-scapular, medial calf, front thigh, metacarpal) & girth (arm, waist, hip, calf) measurements were performed on a randomly recruited, community-living sample of 772 men & 624 women aged ≥ 70 years.

Waist: Hip, % weight loss, corrected-arm-muscle area (CAMA) & BMI were calculated. These measures were categorised into quartiles & also according to commonly adopted definitions of nutritional status.

Cox regression analysis was undertaken to assess the predictive value of the independent anthropometric variables for 4-year mortality, adjusting for potential confounders (age, gender, marital status, smoking, alcohol status, self-rated health, ADL & co-morbidity).

Risk of 4-year mortality increased with weight loss > 10% over two years (HR= 2.53, CI= 1.37-4.67) & CAMA < 21.4 cm^2 (M), < 21.6 cm^2 (F) (HR= 1.93, CI= 1.03-3.60). A metacarpal SF (mm) in the 3rd & 4th quartiles was associated with reduced risk of 4-year mortality (HR= 0.41, CI= 0.22-0.75 & HR= 0.56, CI= 0.32-1.00, respectively).

These results indicate that selected anthropometric indices (weight loss, CAMA & metacarpal SF) independently predict increased risk of 4-year mortality & highlight their potential use for nutrition screening in community living older Australian adults.

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ESTIMATING STATURE FROM KNEE-HEIGHT: IMPLICATIONS FOR AN ALTERNATIVE RELATIVE MASS INDEX

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It is well documented that obtaining an accurate measure of BMI in older or disabled individuals can be difficult due to difficulties in measuring height. This study evaluates the use of knee-height (KHt) for estimating stature in Australians & an alternative relative mass index (RMI) to BMI, using KHt as a measure of skeletal size. A cross-sectional study of Australian adults (n= 679; 488 males; 18-90 years mean (SD) age 58 (17)) measured weight (kg), height (m), knee-height (m). Estimated stature was determined using a series of published equations (1-3) compared with actual height using 95% limits of agreement. Multiple stepwise-regression was used to develop similar but Australian-specific equations & alternative RMIs.

The mean bias for estimating stature from KHt for the group ranged from –1 to +1.5 cm, but at the individual level, actual height may be under or overestimated by 5.8 to 12.4 cm. Australian developed equations had an adjusted R^2 0.68 & 0.50, SEE 0.039 m & 0.044 m, males & females respectively. This error is considered unacceptable for clinical assessment of an individual. A RMI of weight/KHt was the best estimate of BMI (adjusted R^2 0.882; SEE 1.46 Kg/m).

The magnitude of error for estimating stature from KHt for an individual is significant, even with the use of geographic-specific equations. The resulting error in calculating BMI can have significant implications for nutritional assessment. The alternative RMI (weight/KHt) may be of greater practical use. However, further evaluation in terms of its prognostic value & its relationship to body composition are needed.

1. Chumlea et al (1985) J Am Geriatrics Society. 33(2): 116-120.

2. Chumlea et al (1998) J Am Diet Assoc. 98: 137-142.

3. Ross Laboratories (1990) «Estimating stature from knee-height», Columbus: Ohio.

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NUTRITIONAL STATUS OF SOME ELDERLY IN EGYPT

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In Egypt due to the increasing number of elderly people, attention starts to be paid to geriatric health care. The present study aimed to assess the nutritional status of a group of Egyptian elderly people. Also differences among age categories in the indicators were studied within the groups of the elderly.

Sixty-one healthy Egyptian elderly subjects leading an active life were selected for this study from two homes for elderly in Cairo governorate.

Anthropometric measurements that included body height, weight, body mass index (BMI), body surface area (BSA m^2), body fat (B.F), fat free mass (FFM), arm muscle circumference (AMC), corrected arm muscle area (CAMA).

Food intake was estimated by using the 24-hour dietary recall method and the nutrients intake were calculated from the food composition tables for the Middle East, and the nutritional status was evaluated together with the anthropometric: parameters.

The results obtained showed that all subjects have had an adequate level for most of the nutrients intake except for calcium, vitamin A and C as compared by recommended dietary allowances.

Females had higher body mass index (weight/height^2) than males and fat free mass, while corrected arm muscle area was significantly higher in males. Arm muscle circumference decline with age.

Posters

Nutrition, physical activity and performance

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LACK OF ADAPTATION TO MALNUTRITION IN THE ELDERLY

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Introduction: Fat-free mass (FFM) is lower in healthy elderly subjects than in younger ones, while resting energy expenditure (REE) as a ratio to FFM, is similar, thus supporting the concept of physiological age related-sarcopenia. The aim of this study was to assess REE and body composition in elderly malnourished patients.

Patients and Methods: 48 elderly patients (28F, 20M), aged 77 ± 1 years (mean ± SEM), were evaluated and compared with 38 young patients (20F, 18M), aged 27 ± 1 years. All suffered from chronic protein-energy malnutrition. All were in stable condition, with no infection or cancer, and all were studied after correction of possible hydration disorders. Patients were separated into three groups: lean (body mass index > 18.5 kg/m^2), moderately malnourished (BMI between 16 and 18.5), and severely malnourished (BMI < 16 kg/m^2). Body composition was measured with bioelectric impedance analysis, and REE was measured by indirect calorimetry.

Results:

BMI group	*> 18.5*		*16-18.5*		*< 16*	
Age group	*Young*	*Old*	*Young*	*Old*	*Young*	*Old*
Number	10	10	13	19	15	19
FFM (%)	81.1 ±2.9	72.6± 1.6*	85.0 ±1.8	67.6 ±2.2*	86.4 ±1.5	59.3 ±1.7*
DER/FFM (kcal/kg)	30.9± 1.4	31.2 ±0.9	31.5 ±1.2	37.6 ±1.3*	31.0 ±1.7	47.0 ±1.8*

* p < 0.01 compared to young patients.

Conclusions: Malnutrition in the elderly involves a preferential loss of metabolically active FFM, contrasting with the homogeneous decrease of FFM and fat mass in young patients. This reflects a lack of adaptation to malnutrition. The high REE/FFM values measured in elderly malnourished patients may reflect a wasting process or more probably a preferential loss of muscular FFM, with a stable visceral mass.

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CHANGES IN PHYSICAL PERFORMANCE IN ELDERLY EUROPEANS. SENECA 1993-1999

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Objetive: To assess longitudinal changes in physical performance in elderly Europeans, quantified by subjective and objective measures.

Design: Longitudinal study including measurements taken at SENECA follow-up (1993) which were repeated at SENECA finale (1999).

Methods: Data were collected in a research towns across Europe. In total 444 men and women, born between 1913 and 1918 participated both in the follow-up survey and in the finale. Questions on Activities of Daily Living (ADL) was applied at SENECA baseline (1988/89) to measure self-reported physical perfomance. At SENECA follow-up tests of simple functions (7-item Physical Performance Test, chair stand, tandem stand) were added as objective measures of physical performance.

Results: Both subjective and objective measures of physical performance showed significant increases in the help needed to perform an activity as well as in the time needed to perform the activity. Significantly differences were found between the genders and the research towns in the ability to perform the tests.

Discussion: Measures of physical performance are important in the assessment of disability in elderly people. Whether nutrition, physical activity or socio-economic status can minimise or postpone disability have to be tested further.

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ASSESSMENT OF NUTRITIONAL STATE AND HEALTH CONDITION OF ELDER PEOPLE

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Population of Poland is 38.667.000. Among them 6.333.600 are 60 years old or more. 0.21% all population lives in social welfare homes. From the Cracow population of 710.000 citizens, 2.171 (0,31%) live in 17 welfare homes (15 supported by the government, 2 privately owned).

In 1998, chosen group of 89 dwellers of Welfare Homes in Cracow, aged 60-90 years, were assessed for the state of nutrition and the general health condition.

The assessment of the state of nutrition was based on anthropometric measurements, i.e., height, weight, thickness of four skinfolds. The health condition was assessed on the grounds of the written set of standardised Questionnaire and physical examination.

In the examined group, obesity was found in 30%, overweight in 28% and malnutrition in 4% of subjects. The most common chronic diseases were: hypertension, ischemic heart disease, peripheral vessels diseases, digestive tract diseases (ulcers, cholelithiasis). The most common complaints were: joint pains, abdominal pain, nausea, vomiting, constipation, headaches, thoracic pain, insomnia and low level of physical activity.

General health disturbances observed in the examined group were the typical disorders of the elder age. All pensioners of welfare homes will be covered by a prevention programmes including rehabilitation of their motoric functions.

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CHANGES IN RISK FOR MALNOURISHMENT IN OLDER EUROPEANS AS ASSESSED WITH THE MINI NUTRITIONAL ASSESSMENT SCREENING TOOL

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Background and purpose: SENECA's data set included all items of the Mini Nutritional Assessment (MNA) a tool to evaluate the risk for malnourishment and to identify those elderly who could benefit from early nutritional intervention. The purpose of this study was to examine 5 year changes in mean scores on the MNA and to study the relation with self perceived health.

Design and setting: Longitudinal study with an observation in 93/94 and '99 in 7 European towns: Haguenau & Roman (F); Padua (I); Culemborg (NL); Vila Franca de Xira (P); Bentanzos (E); Yverdon (CH).

Subjects and methods: A total of 427 records were collected from subjects who were born between 1913 and 1918. The MNA includes 18 items and assigns points on nutritional adequacy with a maximum of 30 points: > 24 points is well nourished, 17-23.5 is at risk for malnourishment and below 17 is malnourished.

Results: In 1999 the SENECA participants scored on average 2.4 points lower on the MNA than in 1994 (p. <0.001). There was not much difference in MNA scores and change in MNA scores between men and women, but the average change in scores varied between towns from –1.5 (V/P) to –3.7 (B/E). According to the MNA in '99 only 1% of the participants were undernourished, 14% at risk for malnourishment and 85% well nourished. Participants scoring low at the MNA also had poor subjective health, however about 40% of the well-nourished subjects reported fair or poor subjective health.

Conclusion: The over 80 years old participants in SENECA's FINALE may have been the rather well nourished survivors. However there was a difference in MNA scores between towns.

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NUTRIENT INTAKE AND PHYSICAL ACTIVITY OF ELDERLY WOMEN LIVING IN A NURSING HOME

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Objectives: Nursing home residents are at high risk for malnutrition. The aim of the present pilot-study was to assess the energy and nutrient intake of 47 elderly women (median age 85 y), who are able to eat without help, and of 20 female residents (median age 87 y) needing total feeding assistance. Further, the frequency and amount of physical activity of the self-feeding seniors was determined.

Methods: On 3 different days all foods provided were weighed. Foods not consumed by the elderly were also assessed. In contrast to common methods to measure diet e.g. FFQ or records, this (weighing)- method allows to calculate the net-nutrient intake of elderly people objectively. Moreover anthropometric variables, medication and weight-changes were assessed. Hand grip strength was measured by dynamometer and the level of physical activity was determined by means of a questionnaire.

Results: Median energy intake of self-feeding elderly women was 1620 kcal (850-4450), more than one third of the subjects consumed less than 1700 kcal/d. The intake of vitamins and minerals remained below 30-50% of the recommended level. Eating-dependent seniors are at high risk of protein-energy-malnutrition consuming an average of 1130 kcal/d and 34 g protein/d. The level of physical activity was very low. Only 34% of the seniors were active for more than 2 hours per week (walking, gymnastics) and 30% were totally inactive.

Conclusion: Not only optimizing the quality of delivered foods but also increasing the level of activity should aim at improving the nutritional status of the elderly. It is often ignored that immobility represents a major risk factor for the development of undernutrition. Inactivity accelerates the loss of muscle mass. This loss of metabilically active tissue decreases the energy requirements thus leading to a loss of appetite and reduced food intake. In conclusion an adequate strength training plays an important role to prevent undernutrition.

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ACTIVITIES OF DAILY LIVING IN THE SPANISH ELDERLY. ASSOCIATION WITH THE MORTALITY

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The ability to manage basic activities of daily living (ADL) is a significant predictor for being housebound, placement in a nursing home and death. The aim of the study was to assess the capacity to perform activities of daily living in the Spanish sample (30 men and 49 women aged 80-85 y) from SENECA's Finale study (1999) and the changes of it respect to the same sample ten years ago.

The total ADL score (assessed by 16 questions) and the partials (mobility ADLm and self-care ADLc) in the sample is presented in the following table.

	1989		*1999*	
	Men	*Women*	*Men*	*Women*
ADL c	7.9± 1.7	7.8± 1.2	9.0± 3.73	9.8± 4.0**
ADL m	4.6± 1.6	5.7± 2.3	5.9± 3.1*	6.8± 3.3*
ADL t	18.8± 4.4	19.9± 4.8	23.9± 10.2*	25.3± 9.6***

* p< 0.05 **; p< 0.01; *** p< 0.001.

The ADL score from deceased subjects whose participating in 1989 was significatively worse (p< 0.01 in men and p< 0.001 in women) than ADL score from survivor subjects.

ADL t 1989	*Men*	*Women*
Deceased (n= 67)	24.3± 8.0 (n= 38)	27.1± 10.9 (n= 29)
Alive (n= 105)	19.3± 4.7 (n= 41)	20.8± 7.4 (n= 74)

Activities of daily living as a measurement of functionality decline with increasing age and in our study a better ADL score is found as survival factor.

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PHYSICAL ACTIVITY IN EUROPEAN SENIORS: ATTITUDES, BELIEFS AND LEVELS

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Objectives: To identify in the elderly European population, the attitudes to physical activity (PA) and health, in order to define adequate strategies of promotion.

Design: Cross-sectional survey using a face-to-face interview-assisted questionnaire.

Methods: This project belongs to the multicentric Pan-EU Survey on consumer Attitudes to PA, Body Weight and Health under the leadership of the Institute of European Food Studies –Dublin– with the cooperation of members from all EU countries. 1903 European citizens, aged ≥ 65, were interviewed The data's descriptive analysis, was followed by univariate

analysis to characterise the study's sample. Results will be presented at the European level as well as for each country.

Results: PA was not viewed by the elderly as a major health determinant as it ranked only 5th (18%), following food (42%), smoking habits (40%) and alcohol (24%). 41% of elderly were not engaged in any type of PA, but 50% dedicated more than 3,5 hours/week on various activities. At EU level the most common activities included walking, gardening, cycling, and swimming. 64% of the elderly thought that they do not need to do more PA, and 37% were in the pre-contemplation stage as they were currently not very physically active and they didn't intend to become physically active in the next 6 months. A large variation in attitudes, and behaviours in relation to PA, was found amongst European countries.

Discussion: Programmes to promote PA need to be tailored to the different countries in order to increase/maintain PA in the elderly.

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LIFE SATISFACTION IN RELATION TO PHYSICAL CAPABILITY OF ELDERLY PEOPLE

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Introduction: Demographic data in Novi Sad indicate incrising participation of old people in general population. The average age of population is 38, 4 years, ageing index is 0,794, proportion of people aged 60 and above in general population is 16,8% and according to biological population type Vojvodina belongs to regresive one.

Objectives: Aged people (60 and above) take significant place in the structure of population with incrising life expectancy. The aim of this paper was to analyse life satisfaction of old people related to mobility and self-care capability, as the important components in quality of life.

Design and methods: This study was conducted in the territory of Novi Sad, including both urban and rural population aged 60 and above, using random sample method (N= 240) from the list of inhabitants. The instrument was modified McMaster Health Index questionnaire sent by post.

Results: The most of inquired persons (95%) are able to walk out-of doors by themselves, 68% have no difficulty walking as far as a kilometer, half of them are able to run short distance about 100m and quarter of them are able to take part in some sports. Some of them (10%) have physical difficulty travelling by bus; almost 5% aren't able to walk out-of doors and 0,8% can't walk at all. As for the self-care, 75% of inquired persons are able to do light housework, but 5% have difficulties feeding themselves, 8% dressing themselves and 7,3% have difficulties washing themselves. 37,8% estimate their health as a good, but 27% describe themselves as unhappy or very unhappy persons. Multiple regression method showed significant correlation ($p< 0,01$) between life satisfaction and preserved mobility and self-care capability.

Conclusion: Elderly people who are in better physical shape are more sattisfied with their lifes, and according to that have a better quality of life.

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ELDERLY PEOPLE, INFLUENCE OF OSTEOARTICULAR PATHOLOGY (OAP) ON THE QUALITY OF LIFE

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In elderly people it is difficult to define and to evaluate the quality of life, because not only health status but also the ability to perform the daily tasks and social activities, financial position, emotional status and the absence of aches and pains play a role in quality of life. Given that the OAP is, together with the cardiovascular pathology, the most common among old people, the aim of this study was to evaluate the degree of incapacity and the aches and pains caused by OAP and to ascertain to what extent this affects the quality of life. The subjects studied were a group of non disabled elderly people, 59 men and 104 women (52-94 years) from a geriatric home depending on the Generalitat Valenciana.

Data obtained from the individual clinical histories and personal interviews make it possible to evaluate: their global health status (Rosser and Kind matrix); physical capacity, vision, hearing, appetite, mastication and manual ability; psychic health; chronic pathologies; medication; ability to perform daily tasks and social activities; quality of the geriatric home and their nutritional status.

OAP affected 61% and 25% of the interviewed women and men, respectively. The global health of 51% of these OAP sufferers as rated by the Rosser and Kind test was «regular or bad», while only 29% of the people who were not suffering OAP received this rating. From a subjective point of view OAP does not seem to affect the health and quality of life of people suffering it, except insofar as it diminishes manual capacity. People affected by OAP have a significantly higher fat mass than the rest. When health care and social services are good, many of our subjects, like those of the Euronut- SENECA study (1988-89) feel that their health and quality of life are also good in spite of their numerous chronic diseases.

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NUTRITION STATUS IN THE ELDERLY LIVING AT HOME: MULTIDIMENSIONAL GERIATRIC ASSESSMENT

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Objective: The objective of the present study consist in determining the factor related to the nutritional status in elderly. The social functioning, family support, ability to perform basic activities of daily living, cognitive impairment or socioeconomic status in interaction with other factors are considered the fundamental elements to assessment in the treatment and care the elderly people.

Methods: A cross-sectional study was performed in a rural Primary Health Service (2237 sanitary card). The elderly over 80 year of age living in the community were studied (n= 60). The sociofamiliar support, drug consumption, physical (clinical status, body mass index, oral status) functional (Katz I) and mental status (Pfeiffer I) were evaluated.

Results: The population aged 65 and over was 14,78%, 80 and older 2,6% (63,3% female), their average age was 84,9 (80-93). In the population of 80 and older the 75% had hypertension, lipid disorder 31,1%, diabetes mellitus 21,05, 67,34% had overweight, cognitive disorders 16,6%, those under prescriptions of three drugs and over were 63,3%, with independent functional status 60%. Edentulous patients 29,09%, some dental pieces 9,09% and complete denture-wearing patients 61,81%. The study of clinical status showed association the overweight with HTA (81,25%), lipid disorder (33,3%) and DM (24,2%). Among the patients 90,8% live in family settings and the 15,5% receive help from primary care physicians at home.

Discussion: The rural population studied above, has been included in a geriatric evaluation program and that fact explains the high overweight prevalence within this range of age where all possible cases have been therefore detected. The high incidence of diabetes mellitus and overweight within the Canaries establishes a relevant relationship with the development of hypertension. The family support in the rural canarian population, sustain a better life quality of the elderly while at home explaining the high level of independent functional status previously demonstrated and why any malnutrition case was detected. The multidimensional geriatric assessment has been demonstrated as priceless tool for the detection of all the physical, social, mental and functional factors that conditions the health status and the life quality of the elderly.

Posters

Interactions

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RELATION BETWEEN PLASMA HOMOCYSTEINE AND COFFEE AND TEA CONSUMPTION

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Within the longitudinal study on nutrition and health status in an ageing population of Giessen, Germany (GISELA) we investigated the effect of coffee and tea consumption on plasma levels of homocysteine.

In a sample of 138 females (age 69.2 ± 5.3 y, BMI 26.6 ± 4.1 kg/m^2) and 67 males (age 69.9 ± 4.9 y, BMI 26.7 ± 2.8 kg/m^2) total plasma homocysteine levels were analysed by HPLC. Blood was taken after an overnight fast. Coffee and tea consumption was assessed by a 3-day-food record especially developed and validated for our study. All participants were at least 60 years old, non-smokers and did not take vitamin supplements.

The mean plasma homocysteine level of the women and men was 8.47 ± 2.78 µmol> mol/L and 9.58 ± 3.17 µmol/L, respectively. The mean coffee and tea intake of the women was 412 ± 217 ml/d, that of the men 473 ± 248 ml/d. No correlation (Spearman) between plasma homocysteine concentration and coffee and tea intake could be found in both sexes. The mean homocysteine concentration did not differ significantly between tertiles of coffee and tea intake in women and men.

Our results show no effect of coffee and tea consumption on plasma levels of total homocysteine.

Posters

Mental health

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ASSOCIATIONS BETWEEN NUTRITIONAL INTAKE AND COGNITIVE FUNCTIONS IN A HEALTHY AGING SAMPLE

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Objetive: To examine the association between nutritional intake and cognitive performance.

Subjects: 96 free-living elderly (aged 64-93 years). Participants were free of significant cognitive impairment.

Method: Nutritional intake was evaluated by a three-day food record and cognitive performances by the Mini Mental State (MMS), the Symbol Digit Modalities Task from the Weschler Adult Intelligence Scale (WAIS) and a timed cancellation task.

Results: Performance on cognitive tests in 1997 was related to both past (1993) and concurrent (1997) nutritional intake. Concurrent vitamin C intake was significantly associated with MMS and WAIS score (r_s= 0.21-0.28). Past vitamin C intake was significantly correlated with the MMS and WAIS scores (r_s= 0.21-0.23) and with the cancellation task score (r_s= 0.24). Past vitamin B1 intake was associated with MMS (r_s= 0.22). The general diet quality, evaluated by a healthy diet indicator (HDI) was also associated with better cognitive performance. Subjects with a higher HDI in 1993 had significantly better MMS and cancellation task scores in 1997 than those with a lower HDI.

Conclusion: Although associations were relatively weak in this healthy sample, these results support a relation between the quality of diet and cognitive performance.

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EATING BEHAVIOUR DISORDERS ARE CORRELATED WITH AUTONOMY IN ALZHEIMER PATIENTS

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Objectives: Eating behaviour disorders are common in Alzheimer's Disease (AD). The aim of this study is to examine associations between eating behaviour disorders evaluated by Blandford scale and other parameters (study funded by the European Commision).

Design: Cross-over study with 223 patients with AD (age: 76.6± 8.1, MMS: 15.3± 6.8, Blandford: 2.8± 3.5) living at home with a caregiver, in 3 European countries.

Methods: Several parameters (cognitive function: MMSE, autonomy: ADL and IADL, nutritional state: MHA, behaviour troubles: Cohen-Mansfiel scale, mood: Cornell scale and BMI) have been assessed in the patients during an evaluation. Caregivers were asked for their age, BMI, nutritional and Alzheimer knowledge (assessed by two questionnaires), burden feeling (assessed by the Zarit scale) and quality (spouse, child...). Blandford total score, score of categories and score of each item were correlated to the other parameters. The Kruskal-Wallis test and the Spearman test were used.

Results: Table: Correlation between Blandford total score and the other parameters

	R (Spearman test)
Patient age	0.15
Patient BMI	0.0012
MNA	–0.303***
Cohen-Mansfield scale	0.353***
Cornell scale	0.332***
ADL	–0.378***
IADL	0.34***
MMS	–0.12
Zarit scale	–0.02
Carer age	–0.205**
Carer BMI	–0.178*
Nutritional knowledge	–0.248**

*** p< 0.001; ** p< 0.005; * p< 0.05.

Moreover, more than 50% of the items are associated with IADL (74%). ADL (71%), MMS (62%) of Cohen-Mansfied scale (58%).

Discussion: Eating behaviour disorders (total score, items, categories) are overall associated with autonomy and behaviour. Nutritional state and mood are two well correlated with eating behaviour disorders. On the other hand, Blandford total score is not associated with MMSE whereas 62% of the Blandford items are correlated with it. Caregivers could play a role in eating behaviour disorders because a lot of carers characteristics are linked with Blandford scale even if burden feeling by the carers is not correlated with eating behaviour disorders.

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RELATED FACTORS WITH MINI NUTRITIONAL ASSESSMENT IN PATIENTS WITH ALZHEIMER DISEASE

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Background: Weight loss and behavioral feeding problems are frequent among patients with Alzheimer disease. The origin of this weight loss is still poorly understood and could be multifactorial. Weight loss accelerates disease course, decreases patient's quality of life and increases the caregiver's burden.

Objective: Relate the nutritional status impairment with cognitive functions, behavior, autonomy, and depression.

Design: As part of a multicentric interventional study on the impact of caregiver educational program, we analyzed, at the entry of study 225 Alzheimer disease patients: 76.7± 8.1 years old, with a mean Mini Mental State (MMS) score of 15.4± 6.8 and a mean Mini Nutritional Assessment

(MNA): of 23.3± 3.5. We determined relationships between nutritional status (MNA) and Cognitive functions (MMS), depression (Cornel scale), behavioral problems (Cohen-Manfield scale), autonomy [Activity of Daily Living (ADL) and Instrumental Activity of Daily Living (IADL) scales] and feeding behavior (Blandford scale).

Results: Patients were separated in two groups according to their MNA score higher (patients well nourished) or lower (patients at risk of undernutrition or undernourished) than 23.5.

Univariate analysis found that MNA was related with cognitive functions, behavior, autonomy, and depression.

Multivariate analysis using step by step regression found that MNA was only related with Cornel scale (depression) and with IADL (autonomy).

The risk of a nutritional status impairment (MNA ≤ 23.5) increased by 14% when Cornel scale score worsen by 1 point (OR 1.14, IC 95% 1.06-1.23) and increased by 8% when IADL score worsen by 1 point (OR 1.08, IC 95% 1.04-1.12).

Discussion and Conclusion: In Alzheimer disease patients, nutritional status is in relation with depression and autonomy; it could be improved by taking into account the depression and adapting environment to maintain patient autonomy as long as possible.

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MENTAL STATE AND ACTIVITIES OF DAILY FIVING. RELATIONSHIP IN A SPANISH OLDER GROUP

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Objectives: To analyse mental state, cognitive and affective, and physical functionality in order to assess repercussions in each one of other.

Design: This study is part of European multi-centre longitudinal survey SENECA.

Subjects and methods: 31 men and 48 women, of 82.4± 2.0 and 82.3± 1.7 years old, respectively. Cross-sectional study, in 1999. Standardised techniques are used:

1. Mental state or psychical funcionality: cognitive (Mini-Mental State Examination: MMSE) and affective (Geriatric Depression Scale: GDE).

2. Phisical functionality (Activities of Daily Living: ADL).

Results and discussion: Cognitive state, higher (p< 0.05) in men (24.2± 4.3) than in women (21.3± 5.4), get worse respect 1993 Seneca's population. This psychic aspect is in women under functional limit (MMSE= 23). The mean of affective state is similar in men (2.8± 3.3) and women (4.1± 3.5), and in total Seneca of previous period, 1993. The last functionality does not overcome the value that signs a depressive status (GDE= 5). Cognitive functionality in women improves when the affective functionality does it as well (r= 0.405, p< 0.01).

Physical functionality is similar in men (23.2± 9.9) and women (25.0± 9.7). An increase in it is observed when in women mental state, cognitive (r= 0.545, p< 0,001) and affective (4= 0.385, p< 0.01), grows up. In this way, physical and affective functionalities in men get better at the same time (r= 0.383, p< 0.05). In sum, physical and mental functionalities are, in general, positively associated in the elderly.

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ASSESSMENT AND NUTRITIONAL INTERVENTION IN PATIENTS WITH MODERATE-SEVERE DEMENTIA

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Demenu Group.

Aims: To analyse the nutritional status of patients with dementia living in nursing-homes and the efficiency of nutritional supplement in order to modify cognitive and functional status and morbi-mortality parameters.

Methods: Prospective study (follow-up one year) of patients with moderate-severe Alzheimer's disease (FAST: 6-7). Basal study includes the following data: cognitive (MMSE), functional (Blessed), anthropometric and biometric assessment. The follow-up study includes: morbility, mortality, infections, hospital admissions and length of stay in bed. Were established two groups: A) Control group without nutritional supplement (n: 75, mean age 85,6± 4, women 78%) B) Intervention group with Pentaset Intensive® (N. 30, mean age 84,7± 3,9, women: 75%). Date base SPSS, statistical measurement of common tendency and dispersion and quantity comparative data t Student (interval confidence 95%).

Results: The patients of interventional group improve antrophometric and biometric parameters. We dont find cognitive and functional modifications.

Parameters	*Group A*	*Group B*
Proteins	6,1± 0,6	6,6± 0,5
Albumin	3,32± 0,4	3,81± 0,5
Beta-carotene	0,71± 0,4	1,47± 0,5
Vitamin E	7,1± 1,3	8,2± 1,8
Mortality	21	17
Stay in bed	12,6± 3,4	7,4± 2,9
Infections	67	40

Conclusions: 1. Anthropometric and biometric parameters improve in the interventional group. 2. Global mortality, infections process and length of stay were lower in interventional group. 3. Differences were not observed in the cognitive and functional evolutive process.

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LIFE STYLE CHARACTERISTICS ASSOCIATED WITH NUTRITION STATUS ˙A T RISK¨ IN ELDERL Y SUBJECTS AGED 80-85 YEARS

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The study objective was to determine the extent of associations between diminished self-care ability, cognitive impairment, living alone status, and at-risk nutrition status in persons aged 80-85 years. Subjects were 627 individuals who participated in all three data-collection phases of the Seneca study in 1988-89, 1993, and 1999. Diminished self-care ability was defined as not being able to perform all 7 self-care items on the ADL instrument. Respondents were deemed to have possible cognitive impairment if they scored ≤ 23 on the MMSE test. Residence situation was categorized as either living alone, with spouse/partner, or with others. Nutrition status was categorized as being well nourished or at risk of malnutrition, using an 18-item mini-nutritional assessment questionnaire.

There was wide variation between study locations in the percents of respondents who were found to have possible cognitive impairment and to have diminished self-care ability. Differences between genders were noted for most variables. In 1999 women were more likely than expected to live alone or to live with others and less likely than expected to live with spouse only, while the opposite pattern held for men. In 1999 only 31 percent of the women and 49 percent of the men were able to do all seven tasks, down from 61 and 78 percent in 1993. Those not able to do all 7 self-care tasks were more likely than expected to have MMSE scores of ≤ 23, and both men and women who were not able to perform all 7 self-care tasks were more likely than expected to be at risk of malnutrition. In addition, those who were not able to perform all self-care tasks were more likely than expected to live with others, and were less likely than expected to live with spouse only. Decreased cognitive and functional status is associated with both greater dependency relative to living situation and increased risk of malnutrition.

Posters

Energy balance

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INDIVIDUALISED PRESCRIPTION OF NUTRITIONAL SUPPLEMENTS IN OLDER ADULTS: A PILOT STUDY

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Systematic reviews of the effectiveness of oral nutritional supplementation have shown equivocal results. This may in part reflect failure of dietary intake plus supplement dose to meet energy requirements and hence improve nutritional status. This study pilots a pragmatic, individualised approach to nutritional supplementation in malnourished older adults, based on providing estimated energy requirements of the individual patient.

Individual energy requirements were estimated based on BMR, limited activity, trauma and weight gain (0.25 kg/week). The shortfall between dietetic assessment of patients' dietary energy intake and estimated requirements was used to determine the volume of nutritional supplement to be administered to each patient. This volumen was prescribed in the patients' medical records and administered as if medication in four equal doses/day for a total of three days.

Twelve patients (age range 73-92 years) received the prescribed nutritional supplement in doses ranging from 60 ml-180 ml. Nursing staff recorded that 7 of the 12 patients consumed > 75% of the supplement prescription over the three days whilst only: one patient consumed < 50% of the supplement prescription. The supplement was well accepted by patients, with only one reporting that the supplement had interfered with food intake. Nursing staff response was positive regarding the ease of administration, reduction of supplement waste and patient acceptability.

The individualised prescription and delivery of nutrition supplements to older adults appears to be practical in the clinical setting. Further studies are required to establish the utility of this approach with respect to meeting energy requirements and achieving adequate nutritional status in a range of patients. This may enhance the design of interventions in clinical trials that evaluate the impact of nutritional support on morbidity and mortality outcomes.

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RESTING METABOLIC RATE, BODY COMPOSITION, AND FAT DISTRIBUTION IN AN ELDERLY GERMAN POPULATION

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Within the longitudinal study on nutrition and health status in an aging population of Giessen, Germany (GISELA) the relationship between resting metabolic rate (RMR) and fat free mass (FFM), fat mass (FM) as well as fat distribution was investigated.

After an overnight fast in a sample of 164 females (age 67.7 ± 5.6 y, BMI 26.4 ± 3.7 kg/m^2, WHR 0.83 ± 0.06) and 98 males (age 67.1 ± 5.2 y, BMI 26.2 ± 2.9 kg/m^2, WHR 0,95 ± 0.06) RMR was assessed by indirect calorimetry and body composition by using bioelectrical impedance analysis. As a marker for fat distribution waist-to-hip-ratio (WHR) was used. Subjects were at least 60 years old, did not suffer from hypothyroidism, hyperthyroidism or edema and did not take thyroid hormones or diuretics.

Regression analysis for prediction of RMR [kJ/d]

	Regression equation	*P*	*r*	*r2*	*SE*
F	1688 + 102 FFM	0.000	0.73	0.54	444
	1737 + 78.6 FFM + 27.7 FM	0.000	0.76	0.57	428
	–492 + 96.6 FFM + 2876 WHR[1)]	0.000	0.77	0.60	415
M	1862 + 92.5 FFM	0.000	0.66	0.44	564
	1913 + 79.3 FFM + 25.7 FM	0.000	0.68	0.46	554
	–1485 + 91.5 FFM + 3601 WHR*	0.000	0.72	0.52	526

* Stepwise multiple regression analysis considering FFM, FM, and WHR FFM [kg], FM [kg]. F = Females, M = Males

Results show that RMR is not only dependend on FFM but also is influenced by FM, especially by fat distribution.

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ESTIMATION OF THE ENERGY REQUIREMENT OF GERIATRIC PATIENTS WITH THE HARRIS AND BENEDICT FORMULA

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In dietetic practice the Harris and Benedict formula is often used to calculate the daily energy requirement of patients. Accordingly a study to compare the energy requirement estimated with the Harris and Benedict formula and the energy expenditure in «stable» geriatric patients was carried out over a period of 4 to 24 weeks at the University Medical Center St. Radboud (UMC St. Radboud), Nijmegen, The Netherlands.

Subjects were 8 male and 7 female patients aged 68 to 87 years, Body Mass Index (BMI) 19 to 30 kg/m^2 residing in the geriatric ward UMC St. Radboud. Patients who were on tube feeding and patients who were confused were excluded from the study. The Resting Metabolic Rate (RMR) was measured with the Deltatrec Metabolic Monitor (DMM). In accordance with the literature the Physical Activity Rate (PAR) was set at 1.3. The factor 1.3 was checked by observing the activities of all patients for one day. The Total Energy Expenditure (TEE) was calculated as RMR x PAR. The Harris and Benedict formula with a 20% allowance represented the estimated energy expenditure at a very low activity level. The energy intake was measured with a three days observed weighed record.

On group level the measured energy expenditure (TEE) was 6611 ± 1364 kJ (1580 ± 321 kcal). The energy calculated according the Harris and Benedict formula was 6372 ± 1243 kJ (1523 ± 321 kcal). The difference between the estimated (TEE) and calculated energy was not significant. Body weight had not significantly been increased with 0.6%.

The Harris and Benedict formula can be very useful to estimate the energy requirement for geriatric patients. Energy intake 6247 ± 1548 kJ (1494 ± 370 kcal) is low and the supply of micronutrients is likely to become inadequate at this level.

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ENERGY INTAKES OF INSTITUTIONALISED AND FREE-LIVING OLDER PEOPLE

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Objectives: To compare energy and percentage of total energy from protein, fat, carbohydrate and alcohol between free-living (FL) and institutionalised (INS) older people.

Design: Cross-sectional study.

Methods: 23 FL volunteers (mean age 75 years, 48% male) and 16 INS volunteers (mean age 88 years, 20% male) were recruited. Food intake was measured using the 4-day weighed inventory method. Nutritional analysis was carried out using the computer program Dietplan 5 for Windows.

Results

Variable	*Settings*	*Mean*	*sd*	*Range*
Amount of food eaten (g/d)	FL	2.284	771	(1,278-4,811)
	INS	1.600**	748	(702-4,068)
Energy (kcal/d)	FL	1.820	419	(1,126-2,781)
	INS	1.277***	227	(866-1761)
% protein	FL	15	2.9	(11-21)
	INS	14	1.7	(12-18)
% fat	FL	33	6.1	(20-45)
	INS	40***	4.8	(32-48)
% carbohydrate	FL	49	6.9	(35-60)
	INS	45	4.2	(37-51)
% alcohol	FL	3	6.0	(0-26)
	INS	0**	0.1	(0-0.3)

Significantly different between FL and INS: ** p< 0.01, *** p< 0.001.

Discussion: Energy intakes were significantly lower in the INS group compared with the FL group, due to the lower amount of food eaten. The energy intakes in the INS group were below the Estimated Average daily Requirement (Department of Health, 1991). The energy derived from fat was higher and the energy derived from carbohydrate lower than the recommendations in the INS group. This research was fully sponsored by Reckitt & Colman Products.

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DAILY INTAKE OF MACRONUTRIENTS IN A GROUP OF ELDERLY PEOPLE INSTITUTIONALIZED OF LEON

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There is a great potential for nutritional intervention with the elderly to increase longevity and to improve physiological functions and life quality. Total energy intake is the only energetic parameter mentioned in the RDA, with no specification of the desired distribution between major macronutrients.

Method: Dietary consumption was evaluated in a group of 124 elderly people in institutions for the aged by in-person interview using «weight method» (50% males, 50% females, 79± 8 years old).

Results: The dietary intake/day was:

	All subjects	*Males*	*Females*	*P< 0,05*
Energy (Kcal)	2304.1± 848.0	2740.5± 728.3	1965.4± 96.0	*
Protein (g)	96.22± 25.13	116.16± 41.10	80.75± 15.44	*
Fat (µg)	94.49± 27.39	104.81± 52.44	86.48± 12.08	
Carbohydrates (g)	236.74± 109.13	261.34± 113.69	217.66± 36.18	
Fiber (µg)	23.72± 5.81	25.26± 13.37	22.52± 4.63	
Cholesterol (mg)	334.95± 101.94	382.88± 85.72	310.56± 65.30	

Mean± SD.

The conclusions from this study were:

1. Energy intakes were higher than RDA Spanish people.
2. The macronutrients intake were unbalanced.
3. Fiber intake was lower than RDA.
4. Daily intake of cholesterol was higher than recommendations.

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CALORIC INTAKE IN ELDERLY PEOPLE FROM EXTREMADURA, SPAIN

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Objetives: To evaluate the nutritional status of a group of elderly people of the Comunidad of Extremadura (students of the Older Citizens University of the UEX), and investigate their caloric intake and the relative contribution of the nutrients.

Design and Methods: A total of 122 subjects of mean age 62.5± 5.3 years (64 women, 57 men) responded to a survey on their food intake the day before. The nutrient and caloric intake was calculated using a computer program from the University of Granada (Nutrifarmacia, Alimentacion y Salud).

Results: The caloric intake (kcal/24 h) was 1801.8± 468.0 for all the subjects, (1744.4± 431.8 in women and 1869.8± 504.2 in men). The caloric contributions (% total kcal/24 h) were: carbohydrates 44.8± 8.0 total (46.1± 8.1 women, 45.4± 8.0 men); proteins 20.0± 4.5 total (20.5± 4.4 women, 20.3± 4.7 men); and fats 35.4± 7.2 total (35.6± 6.9, women 36.2± 7.7 men). The fat consumption for the total group (g/24 h) was: monounsaturated 24.4± 11.8; polyunsaturated 11.0± 5.0; and saturated 16.8± 8.5.

Discussion: We found no statistically significant differences by gender in nutrient intake. Relative to the RDA and caloric requirements of this age group (2400 kcal for men and 1900 kcal for women), our subjects intake was less than the recommended value. Relative to the recommended levels, the consumption of carbohydrates was lower, of lipids was slightly higher, and of proteins was higher.

Posters

Micronutrients

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DIETARY FOLATE SUPPLEMENTATION IN AGED RATS

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Folate supplementation or food fortification is being nowadays recommended because of its effect on the prevention of neural tube defects and the lowering of homocysteine levels. We have previously reported a negative effect of high dose folate supplementation on dietary protein utilization in pregnant and weanling rats (Achón et al, 1999; 2000).

Objectives: The present study was undertaken to determine the effects of such folate supplementation on nutritional and biochemical markers in aged rats.

Design and methods: Aged male Wistar rats were given free access either to a folate supplemented diet (40 mg/kg diet) or a control diet (1 mg/kg diet) for 29 days following a week adaptation period. Two critical periods were used for metabolic balance studies (experimental days 1-8 and 22-29), which involved the determination of digestive and metabolic protein utilization. Biochemical markers involved in the methylation cycle were also determined.

Results: Dat show that long term high folate supplementation reduces nitrogen digestive function in aged rats ($P< 0.03$) during the second metabolic period (days 22-29). However, supplementation did not alter metabolic protein utilization. Plasma homocysteine and serum vitamin B_6 levels, hepatic SAM and SAH concentrations –and thus methylation ratio, SAM/SAH–, were neither affected by folate supplementation.

Discussion: Folate supplementation at high doses may have a negative effect on diet utilization.

(1) Achón M, Reyes L, Alonso-Aperte E, Úbeda N, & Varela-Moreiras (1999) J Nutr 129:1204-1208.

(2) Achón M, Varela-Moreiras G. & Alonso-Aperte E. (2000) V Workshop on Methionine Metabolism.

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REDUCED SERUM. CONC. OF RIBOFLAVINE, PYRIDOXAL-5-PHOSPHATE, ASCORBIC ACD AND ERYTHROCYTE THIAMINE PYROPHOSPHATE IN GERATRIC PATIENTS WITH, AND WITHOUT PRESSURE SORES

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Malnutrion increases morbidity and nutritional deficiencies delay wound-healing. Pressure sores develop over the sacrum, heals and other pressure exposed areas. Factors as ischemia, drugs, and nutritional factors contribute to pressure sores.

We have therefore studied food intake, body core indice, conc. of the vitamins mentioned above, calcidiol, and zinc in 11 consequtive patients and 11 age- matched controls with the same primary diagnosis.

	*Reference**	*Controle Patients*	
		Mean– SD	
Riboflavine (ng/ml)	89-100	12± 14	14± 23
Vitamin C (ug/ml)	7.1-14	7.4± 5.4	4.2± 3.4
Pyridoxal-5-phosphate (ng/ml)	88-104	4 3± 13	51± 23
Thiamine di-phosphate (ng/ml)	91-104	4 7± 17	44± 19
Calcidiol (nmol/l)	25-85	23± 18	21± 17

* Reference values from 15 healthy employed, age 25-45 years.

Conclusion: There is significant reduction in serum cons. of a number of vitamins, compared to young healthy individuals, but vitamin C conc. is the only significantly reduced in the pressure sore group compared to those without pressure sores.

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GEOGRAPHICAL VARIATIONS IN VASCULAR RISK FACTORS: THE UK NDNS: PEOPLE AGED 65 YEARS AND OVER

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The ongoing UK National Diet and Nutrition Survey (NDNS) programme is commissioned by the British Government. Fieldwork for the NDNS of people aged 65 years and over was performed in 1994/5, and the official Report was published in 1998 (1). Participants were a representative, random selection of people aged 65+ years, living elther in the community or in long-stay institutions such as nursing homes.

From the community group, 1632 provided detailed demographic and other lifestyle information from a face-to-face interview; 1275 provided a complete 4-day weighed diet record, and 944 provided a blood sample, which was used for a wide range of status assays, principally for micronutrient indices.

Additional disease-risk indices were subsequently measured: total plasma homocysteine, cysteine and cysteinyl-glycine.

Cardiovascular disease rates are highest in Scotland and Northern England. Serveral major risk factors varied in parallel with the north-south gradient in disease risk: antioxidant nutrient indices, plasma vitamin C, plasma carotenoids and blood glutathoine peroxidase, most B-vitamin indices, and plasma homocysteine. Key Nutrient intakes varied in parallel: salt (sodium) intake was higher in the north. Socio-economic indices likewise varied, with lower family incomes and more manual workers in the north. In contrast, neither total nor HDL-cholesterol exhibited any detectable gradient.

We conclude that many micronutrient-related vascular risk factors vary north-south in the UK, paralleling the disease gradient. This has implications for health-promotion policies in the UK and elsewhere.

(1) Finch S, et al (1998) National Diet and Nutrition Survey: People Aged 65 Years and Over (2 volumes). London: The Stationery Office.

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BRAIN MICROVASCULOPATHY IN ELDERLY SUBJECTS AND PLASMA HOMOCYSTEINE, FOLIC ACID, VITAMIN B12 AND PYRIDOXAL PHOSPHATE CONCENTRATIONS

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Brain microvasculopathy (MV), including lacunar infarction (LI), is one of the main causes of vascular dementia in the elderly. Whereas cardivascular diseases and stroke have been shown to be related to homocysteinemia, the association between MV and homocysteine has not yet been studied.

Objective: to evaluate the association between MV and plasma total homocysteine (t-Hcy), folic acid, vitamin B_{12} and pyridoxal phosphate (PLP).

Design: elderly subjects (70 to 90 years old), without brain infarcts (> 5 mm) as diagnosed by brain CT and free from major health or neurological disorders, were asked to give a blood sample for analyses.

Methods: plasma vitamins and t-Hcy were analyzed by routine procedures. Brain scans were evaluated by a neuroradiologist and scored as specified in the following Table:

Brain tissue status	*n*	*t-Hcy*	*Folic acid*	*Vit. B_{12}*	*PLP*
Without ischemic lesions	16	14[a]	16[a]	360	30
Ischemic lesions (all)	10	29[b]	10[b]	330	31
Lacunar infarction (only)	6	36[b]	11[b]	230	36

Significant coefficients of correlation ($p< 0.05$) were found between t-Hcy and the logarithmic values of the three vitamins (folic acid, vitamin B_{12} and PLP).

Discussion: Brain MV, particularly LI, is associated with homocysteinemia and low vitamin status of the three vitamins involved in S-adenosylmethionine-homocysteine pathway. The study has been performed in a small group and should be extended in order to achieve valid conclusions.

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VITAMIN E STATUS IN A GROUP OF ELDERLY PEOPLE FROM MADRID

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The vitamin E status of a group of 120, independently-living elderly people was investigated. All included subjects (i.e., those for whom it was possible to determine vitamin E status) belonged to a sample of 158 elderly volunteers, subjects of a larger nutritional study. A 5-day food record (including a Sunday) was kept in order to monitor food intake. Serum levels of alpha-tocopherol were determined by HPLC.

Some 95.2% of subjects showed intakes below those recommended; 86.7% did not even meet 66% of the recommended values. At the serum level, subjects showed alpha-tocopherol values of 8.3± 3.6 mg/L, with no differences between men and women (8.5± 3.6 mg/L in men and 8.2± 3.6 mg/L in women). Some 51.7% (52.4% of men and 51.3% of women) showed levels below 7.8 mg/L; 17.5% (14.3% of men 19.2% of women) showed values of <5 mg/L.

The influence of the diet al the biochemical level can be seen in that those subjects with intakes lower than 50% of those recommended showed significantly lower serum levels (7.8± 3.4 mg/L) than those with greater intakes (9.3± 4.2 mg/L). This difference was independent of serum triglyceride and cholesterol levels.

Subjects with coefficients of vitamin E (mg)/polyunsaturated fatty acids (g) (E/AGP) below the 5th percentile (0.32) had significantly lower serum alpha-tocopherol levels (5.3± 1.1 mg/L) than did subjects with E/AGP≥ 0.32 (8.5± 3.7 mg/L).

Given the importance of vitamin E as an antioxidant, and its role in the prevention of a range of pathological processes, insufficient intakes (frequently detected in the group studied) should be corrected.

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HOMOCYSTEIN LEVELS IN ELDERLY PEOPLE OF MADRID: DIETETIC INFLUENCES

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Changes in serum homocystein levels, with respect to intakes of pyrodoxine, vitamin B_{12} and folic acid, were measured in a group of 130 elderly people. Sample subjects were recruited from one Madrid day centre, where independently-living people over the age of 65 spend some hours each day.

A dietetic study was performed using a 7-day food record. Foods consumed were transformed into energy and nutrient values and intakes compared with those recommended for the elderly.

Mean pyridoxine, vitamin B_{12} and folate intakes were 67.2± 16.8%, 392.8± 549.2% and 84.5± 28.3% of recommended values respectively. With respect to sex, differences were seen only for vitamin B_{12} levels (9.1± 12.7 µg/day in men, and 6.5± 8.8 µg/day in women). Some 93.6% of subjects showed pyridoxine intakes below those recommended, as did 17.6% with respect to vitamin B_{12} and 72.8% with respect to folic acid.

Homocystein levels were 12.4 µmol/l (12.6± 3.7 µmol/l in men and 12.2± 7.9 µmol/l in women) ($P< 0.05$). Only one man showed levels over 17.1 µmol/L. No significant differences were seen in homocystein levels between subjects with lower than recommended intakes of pyridoxine or vitamin B_{12} and those with better intakes. However, subjects with folic acid intakes below 200 µg/day showed higher homocystein levels (13.0± 6.7 µmol/l) than did subjects with more adequate intakes (10.9± 4.1 µmol/l) ($P< 0.05$).

Since raised homocystein levels have been linked to an increase in the risk of coronary, cerebral and peripheral vascular disease, modification of the diet to reduce them might be considered a helpful measure.

The diet of the study subjects might be improved, especially with respect to pyridoxine and folic acid. Raising the intake of the latter might be especially useful in controlling homocystein levels and the risk of cardiovascular disease.

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VITAMIN AND MINERAL INTAKES IN ELDERLY PEOPLE

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Objetive: To assess the dietary intake of vitamins and minerals in elderly Portuguese aged 81-86 years.

Design: Cross-sectional study in elderly born 1913-1918, who are participants of the SENECA study.

Setting: Vila Franca de Xira, small town located near Lisbon.

Subjects and Methods: Using standardized methodology data have been collected from a random stratified sample of 81 elderly subjects, 41 men and 40 women (aged 81-86 years). Dietary intake data were collected using 24-hour dietary recall method.

Results and discussion: The nutrient densities were higher than the values observed in 1993, except for vitamin A in both sexes and iron for

women, and they were lower than «Nordisk Recommended Nutrient Densities» only for vitamin A and calcium in both sexes and iron for women. However, the percentage of elderly below the Lowest European Recommended Dietary Intake (LRDI) increased, in relation to the 1993 study, for all the micronutrients in men and in women, except vitamins B1 and B6 in women. The highest percentage of subjects below the LRDI was detected for vitamin A, 78% for men and 73% for women. Regarding calcium, the percentage below LRDI was 39% for men and 45% for women, and for iron was 49% for men and 73% for women.

Conclusion: An increased risk of micronutrient deficiencies was detected.

Key words: Elderly, Portugal, vitamin intake, mineral intake, 24-hour dietary recall method.

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THE INFLUENCE OF VITAMIN B2 INTAKE ON THE ACTIVATION COEFFICIENT OF ERYTHROCITE GLUTATION REDUCTASE IN THE ELDERLY

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The influence of vitamin B_2 on the activation coefficient of erythrocyte glutation reductase (α-EGR) of a group of 133, independently-living elderly people was investigated. All included subjects (i.e., those for whom it was possible to determine α-EGR) belonged to a sample of 158 elderly volunteers, subjects of a larger nutritional study. Food intake was monitored over 5 consecutive days, including a Sunday. Riboflavin status was measured by determining the α-EGR.

Some 23.9% of subjects had riboflavin intakes lower than those recommended. At the biochemical level, 9.8% of subjects (7.7% of men and of 10.6% women) showed α-EGR> 1.2.

Those subjects with riboflavin intakes below 90% of those recommended showed significantly higher α-EGR levels (1.15± 0.16), an indication of a poorer riboflavin status at the biochemical level. Those with greater intakes showed lower α-EGR values (1.05± 0.10).

These results show the repercussion of intake at blood level. Although the mean dietary situation is acceptable and riboflavin intake is 125± 32.6% of that recommended, there remain some insufficiencies that require attention.

Given that milk products provide high levels of vitamin B_2, and bearing in mind that the mean consumption of these products by subjects is 341.1± 159.8 g/day (2.1± 1 servings/day), it would seem advisable to recommend they increase their intake of such foods. This would be especially important for subjects who take less than two rations per day. The data show that those with riboflavin intakes below those recommended took 204.7± 89.4 g/day of milk products (1.3± 0.5 servings/day) compared to the 384± 153.1 g/day (2.4± 1 servings/day) (P< 0.05) consumed by those with higher riboflavin intakes.

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MICRONUTRIENT STATUS OF INSTITUTIONALIZED VENEZUELAN ELDERLY

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Elderly population is a very high risk group for specific nutrient deficiencies. The aim of this study was to determine micronutrient status indicators of special importance during aging. 65 elderly individuals (> 60y), living in a geriatric home of Valencia, Venezuela were studied. Biochemical indicators used for evaluation were: serum level of Vitamin B12 and folic acid by radioimnunoanalysis, vitamin A and E by liquid chromotography, vitamin C by colorimetry and zinc by atomic absorption spectrophotometry. Results, as mean ± SD were: Vit B12= 332,4± 186,4 pg/mL, folic acid= 7,2± 4,5 ng/mL, Vit A= 68,5± 14,3 µg/dL, Vit C= 1,9± 1,0 mg/dL, Vit E= 809± 352,6 µg/dL, zinc= 72,4± 12,8 µg/dl.

Prevalence of deficiencies were: 18,5% for Vit B12, 3,1% for folate, 15,4% for Vit C, 78,8% for Vit E, 58% for zinc and there was no Vit A deficiency. Nutrient intake was adequate for Vit B12, Vit A and Vit C, being deficient for folate, Vit E and zinc. Studied elderly had nutritional deficiencies, that make them a vulnerable group for undernutrition and infection, with a deleterious effect on immune response. A dietary intervention is needed in order to provide an adequate and balanced diet.

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STUDIES ON IODINE CONTENT IN DAILY DIETS, PARTICULARLY IN DIETS OF ELDERLY PEOPLE

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Poland represents moderate degree of severity of iodine deficiency. National program has been introduced of obligatory iodine prophylaxis including the iodination of household salt in the amount of 30± 10 mg KI/kg.

In order to assess the extent of iodine consumption, the calculated assessment were carried out on iodine content in average Polish diets with regard elderly people's diets. The analytical studies of reconstructed average Polish diets were carried out for verification of the calculated assessment of iodine content.

The calculated assessment of iodine content in Polish diets was performed on the basis of the data of the household budgets and the data of iodine content in food products (without kitchen salt). Iodine concentrations in sample of Polish average diets were determined by radioactive neutron activation analysis (RNAA).

The calculated iodine content in average Polish daily diets (adults and children) ranged from 40.4 µg to 50,7 µg. The calculated iodine content in elderly peoples' diets was 76 µg/daily diets. The theoretical values accounted for 71% to 85% of the analytical ones. In all studied diets the amount of iodine coming from food products, not taking into account iodinated salt, was insufficient for the realization of Polish RDA for this element. It shows that iodination of kitchen salt in Poland is necessary. Moreover on the Polish market exist supplements including iodine (20-150 µg iodine in tablet).

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VITAMINS A AND E CONTENT IN DAIRY PRODUCTS AND THEIR CONTRIBUTION TO THE RECOMMENDED DIETARY INTAKES FOR ELDERLY

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Objective: To determine the vitamin A (retinol, ret. esters, pro-vit. A carot.enoids), E (a- & g-tocopherol) and individual carotenoid content in dairy products and to assess their potential contribution to Recommended Dietary Intakes (1) in elderly persons.

Methods: Dairy products commercially available and frequently consumed in Madrid were analyzed. These included: whole, semi-skimmed and skimmed milk, vitamin-fortified milk, dry powder milk, yoghourt, cream, smelted and grated cheese, custard, butter, margarine and dairy-based probiotic products. Analysis were performed by HPLC as previously described (2, 3). Accuracy and precision were assessed using Reference/Certified Materials.

Results: Vitamin A occurs as ester forms (mostly retinyl palmitate) whereas vitamin E is present as free form (mainly a-tocopherol). In supplemmented/fortified products, vitamins A and E are added as ester forms, namely retinyl and tocopheryl acetate, respectively. B-Carotene was the only

carotenoid quantifiable in most products and its content varied accodingly to the fat content of the products. Based on recommended intakes for dairy products in Spain (4), the consumption of three standard portions/day (200 ml whole milk + 125 ml yoghourt + 40-60 g cheese) provide about 16% and 3% of the RDI for vitamin A (1000 ug/d) and E (15 mg/d), resepctively. The same consumption but using fortified/ supplemented milk and yoghourt, may increase the contribution up to 39% (vitamin A) and 24% (vitamin E) of the RDI for elderly subjects.

Conclusion: The inclusion of fortified dairy products in the diet may be a practical, sustainable and cost-effective approach for improving vitamin intake and status in the elderly.

1) «Recommended Daily or Dietary Intake» Internet, 2000.

2) Olmedilla et al. Clin. Chem. 43: (1066-1077), 1997.

3) Granado et al. J. Food Com. Anal, 2000 (submitted).

4) Departamento de Nutricion, Universidad Complutense, 1996. Madrid.

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ZINC DEFICIENCY IS OF LIMITED CLINICAL IMPORTANCE IN THE ELDERLY (> 69 Y) OF OSLO

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Zinc is an important trace element as a cofactor in more than 200 enzymes, in DNA synthesis, cell division and protein synthesis. Zinc deficiency weakens immune response, alters smell and taste, and may cause impairment of memory.

As part of a nutritional study in the elderly (1) the presence of zinc deficiency (serum zink) has been evaluated and correlated to laboratory findings and clinical symptoms in 311 hospitalized patients, and in 106 randomly selected elderly at home.

Serum zinc concentration (umol/L) in the elderly.

	N	*Mean*	*SD*	*Number with s-zink <8 umole/L*
Hospital group	250	11.5	2.5	22
Home group	97	11.6	1.8	4

Conclusion: There is no significant difference in prevalence of zinc deficiency in hospital versus the home living group. The presence of zink-deficiency was significantly correlated to the presence of diarrhoea, but not to weight, body mass index, muscle strength, appetite, taste, tongue atrophy, skin atrophy, nausea, opstipation, alcohol intake or minimal mental score (MMS).

Ref. 1. Mowe M, Bohmer T, Kindt E. Reduced nutritional status in an elderly population (> 70 y) is probable before disease and possibly contributes to the development of disease. Am J Clin Nutr. 1994;59:317-24.

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MINERAL INTAKES OF INSTITUTIONALISED AND FREE-LIVING OLDER PEOPLE

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Objectives: To compare intakes of calcium, iron and zinc between free-living (FL) and institutionalised (INS) older people.

Design: Cross-sectional study.

Methods: 23 FL (mean age 75 years, 48% male) and 16 INS volunteers (mean age 88 years, 20% male) were recruited. Food intake was measured using the 4-day weighed inventory method. Nutritional analysis was carried out using the computer program Dietplan5 for Windows.

Results:

Variable	*Settings*	*Mean*	*sd*	*Range*
Amount of food eaten (g/d)	FL	2284	771	(1,278-4,811)
	INS	1600**	748	(702-4,068)
Calcium (mg/d)	FL	817	312	(429-1,901)
	INS	612*	111	(420-838)
Iron (mg/d)	FL	12.5	5.6	(4.8-25.7)
	INS	5.8***	1.0	(2.9-7.7)
Zinc (mg/d)	FL	7.6	1.9	(4.2-12.0)
	INS	5.7***	1.2	(3.6-7.8)

Significantly different between FL and INS: * p< 0.05, ** p< 0.01, *** p< 0.001.

Discussion: Mean daily intakes for all minerals studied were significantly lower in the INS group than in the FL group. One of the reasons for this lower intake is the fact that the INS group ate significantly less food than the FL group. It is of concern that all of the minerals investigated in the INS group were below the Reference daily Nutrient Intake (Department of Health, 1991).

This research was fully sponsored by Reckitt & Colman Products.

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VITAMIN INTAKE IN THE ELDERLY IN UKRAINE AND ITS CORRECTION

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The research undertaken in Pridneprovye region shows that under currently available living conditions accompanied with the increased need in vitamins in the dietary intake of the elderly, its amount in the factual dietary input makes up only 55-65% of the recommended daily dose.

The purpose of study was to research the adequacy of the vitamin intake and ground the ways to correct it when organizing meals for the advanced age individuals.

The study covered 25 healthy male individuals aged 60-65, residing in Dnipropetrovsk. In the beginning and the end of the monthly trial period the following blood levels were taken three times and included the levels of ascorbic acid, retinolum, folic coenzymes, nycotinamide coenzymes. TDF- and FAD-effects. The dietary correction was performed by way of the daily intake of 200 g bread enriched with Fantamin dietary supplement as well as 200 ml milk enriched with Laktavit mixture (manufactured by AGUA-MDT Corporation (Moscow).

It was established that against the backdrop of the factual dietary intake, the inadequate intake of the vitamins A, C, B_1, B_2, PP and folic acid was registered in 60-85% of the individuals under study. The optimized daily nutritional intake of the volunteers with consideration of the energy used by them allowed to reach 75-80% of the sufficient levels of the vitamin intake. The use of Fortamin and Laktavit supplements allowed to optimize chemical contents of the daily nutrition and as a result to optimize the amount of vitamins and their metabolites in blood.

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VITAMIN B12 ASSOCIATION WITH BONE MINRAL DENSITY, BONE MASS AND BONE CALCIUM IN ELDERLY MEN AND WOMEN

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Introduction: Van Dusseldorp et al (accepted, 2000) showed an association between low vitamin B12 status and reduced bone mass in macrobiotic-fed adolescents. Kim et al (1996) showed a stimulating effect of vitamin B12 on osteoblastic cells. Our objective was to investigate the asso-

ciation between vitamin B12 status and several bone parameters in a Dutch frail elderly population.

Subjects: The study population comprised of 217 free-living Dutch frail elderly. The inclusion criteria were: requirement of health care; age ≥ 70 years; no regular exercise; BMI ≤ 25 kg/m^2; no recent weight loss and no use of multivitamin supplements. Valid measurements were available for 156 subjects.

Methods: Information was obtained about age, sex, alcohol intake, smoking behavior and physical activity. Body weight and height were measured as well as several blood levels, including vitamin B12 and vitamin D, MMA, calcium and PTH. Bone mineral density (BMD), bone mass (BMC) and bone calcium were determined with DEXA.

Results: Plasma vitamin B12 concentration was significantly higher in women (288 pmol/l) than in men (238 pmol/l). Multiple regression analyses showed that in elderly men (n= 45) body weight and serum calcium explained partially BMD, BMC and bone calcium. In women (n=111) different explanatory variables were found for BMC and bone calcium: body weight, height, plasma vitamin B12 and energy intake. BMD was partially explained by weight, energy intake, plasma vitamin B12 and plasma PTH. Vitamin B12 explained 3% of the variance in BMD and 1.5% in BMC and bone calcium. All p-values were < 0.05, except vitamin B12 (p= 0.057) and PTH (p= 0.090).

Discussion: Plasma vitamin B12 contributes significantly to the variance of the bone parameters in women. This association was not found in men.

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TRACE ELEMENTS INTAKE IN ELDERLY PEOPLE OF CAMPANIA COUNTRY: AN EPIDEMIOLOGICAL APPROACH

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The trace elements are substances that from external place introduced in the biological system «man» can influence the functionality of entire system. Considering essential valuation of the trace elements action, we have interpreted an innovative nutritional epidemiology: a) publicising on regional daily «Il Mattino» a nutritional diary type «24 hours recall» provided of week frequency questionnaire; b) distributing in a large bands of people a nutritional diary «week recall».

Material and methods: Were analysed 18780 subjects 50 to 70 years old. Data are been inserted in a computer Pentium II with a program Food Meter and/or Win Food determining the transformation of the dietetic data in single components, then elaborated through Excell of Office 97 Microsoft.

Results and discussion: The trace of elements analysed in the Campania country are: F, Fe, Cu, Cr, I, Se, Zn. The distribution of trace elements in the single province is been elaborated from the program through insertion of the zip code as informatical button for geographical location. There are differences in the distribution of the single trace elements analysed in the five province of the Campania The valuation of consumption of the trace elements in the diet of large homogeneous groups of the population permits to point out the presence of deficit or excess. This permits to avoid state of diseases, with supplementation and alimentary education programs.

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IRON, FOLATE AND VITAMIN B12 DIETARY INTAKE OF AN ELDERLY LEON POPULATION

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Malnutrition is known to have a significant adverse effect on morbidity. More specifical, vitamin and mineral deficiencies which result in a reduced food intake and the consumption of foods which are poor in nutrient density. Micronutrient malnutrition impacts adversely on the elderly.

Method: Dietary consumption was evaluated in a group of 124 elderly people in institutions for the aged by in-person interview using «weight method» (50% males, 50% females, 79± 8 years old). Fasting blood samples were drawn for the determination of haematological parameters.

Results: The dietary intake/day and serum Ferritin level were:

	All subjects	*Males*	*Females*	*P< 0,05*
Energy (Kcal)	2304.1± 848.0	2740.5± 728.3	1965.4± 96.0	*
Iron (mg)	14.1± 8.4	17.04± 7.4	11.82± 1.5	*
Folate (µg)	206.61± 35.52	211.94± 47.03	202.48± 44.7	
B_{12} (g)	5.58± 1.47	8.59± 2.98	3.24± 1.78	*
Alcohol (µg)	20.3± 8.3	35.47± 10.6	6.54± 1.86	
Serum Ferritin (µg/L)	85.21± 25.18	94.43± 27.86	64.33± 20.25	

Mean± SD.

Average daily intakes of iron, folate and B_{12}, meat the recommended requirements for the spanish elderly population.

The conclusions from this study were: (1) energy intakes was higher than RDA spanish people; (2) the intake of iron, folate and B_{12} was higher than recommendations; (3) the dietary intake of the males was higher than the females; (4) the alcohol consumption in the men warrants further investigation.

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VITAMINS AND MINERAL INTAKE IN ELDERLY PEOPLE FROM EXTREMADURA

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Objectives: To evaluate the vitamin and mineral consumption of a group of elderly people of the Comunidad of Extremadura.

Design and Methods: 122 subjects 62.5± 5.3 years (64 women, 57 men), responded to a survey on their food intake the day before. The vitamin and mineral intake was calculated using a computer program from the University of Granada,

Results: We found no statistically significant by gender in the intake of the following vitamins: niacin (24.5± 10.1 vs 25.6± 9.7 mg/day), B1 (1.6± 0.6 vs 1.7± 0.6 mg/day), B6 (1.7± 0.6 vs 1.8± 0.5 mg/day), C (129.5± 82.1 vs 158.1± 97.6 mg/day), D (8.9± 41.2 vs 4.4± 7.6 µg/day), E (7.8± 4.1 vs 8.1± 3.8v mg/day), and folic acid (326.6± 164.0 vs 383.1± 215.3 µg/day). We did find statistically significant differences in the intake of the vitamins: A (582.2± 299.6 vs 771.8± 602.2 µg/day, p< 0.05), B12 (23.4± 20.3 vs 13.3± 12.1 µg/day, p< 0.001) and B2 (1.6± 0.4 vs 1.8± 0.5 mg/day, p< 0.05). With respect to mineral intake, we found no statistically significant differences by gender in the intake of the following minerals: calcium (1046.8± 276.9 vs 1088.9± 307.7 mg/day), iron (20.2± 6.6 vs 18.5± 8.6 mg/day), iodine (73.6± 37.9 vs 73.8± 41.1 µg/day), potassium (2804.6± 1088 vs 2837.5± 1035.8 mg/day), magnesium (405.4± 155.3 vs 366.5± 141.3 mg/day), phosphorus (1407.4± 408.6 vs 1317.2± 447.2 mg/day) and zinc (8.9± 3.3 vs 8.0± 2.7 mg/day). We found a statistically significant difference (p< 0.05) for sodium (2124.9± 1049.5 mg/day in men and 1728.4± 992.5 mg/day in women).

Discussion: Our results showed an intake less the RDA of vit. A, while the vit. B12 intake was greater than the RDA. The intake of the other parameters fitted the recommended values.

Posters

Food patterns

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DETERMINANTS OF DECREASED DIETARY INTAKE OF ELDERLY PEOPLE IN ISRAEL

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Background: Aging was found to be associated with weight loss and decreased dietary intake associated with increased morbidity and mortality.

Objetctives: To determine the dietary intake of older persons in Israel and identify the factors associated with decreased intake.

Methods: 1178 people were randomly selected out of the Negev population, 368 were over 65 years of age. Participants were interviewed for dietary intake using 24-h food questionnaire with additional questions regarding health and eating habits. Data regarding the US population was retrieved from the USDA data, 1994, CSSII data file, which include data on 736 people over 65 years old.

Results: Older people consumed lower calories than the younger age groups (1498.87± 622.89, 1772.35± 811.7, respectively) as well as most of the other nutrients including iron, zinc, vitamin C, B1 and B6. Energy and dietary intake of calcium, zinc, alpha-tocopherol, and folic acid were lower than 75% of the RDA for the elderly. The same trend was shown in the USDA data. The mean dietary intake of all the macronutrients was higher in the US database (energy intake: USDA- 1646.26± 731.95, NNS-1498.87± 622.89) as well as calcium and iron intake. In Israel dietary intake of people over 75 years was significantly lower than people aged 65-74 for most nutrients, while in the USDA the trend of decreased intake remained but was less pronounced. Decreased caloric intake after adjustment for age was associated with lower subjective health status ($p< 0.001$ for males, $p= 0.05$ for females), decreased appetite ($p=0.3$, $p<0.001$), swallowing problems ($p= 0.86$, $p= 0.02$) and lower education ($p= 0.06$, $p= 0.15$). In a multivariate model to predict caloric intake health status and education remained significant for males and decreased appetite and swallowing problems for females.

Discussion: The reduction in dietary intake in the elderly appears to be a global phenomenon. From a public health perspective, identification of nutritional high-risk behaviors may help in designing the appropriate intervention programs, which may prevent the health deterioration pattern associated with aging.

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MANAGEMENT OF INFORMATION ON HEALTHY EATING BY ELDERLY IN THE EU

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Objectives: To assess the most used and credible sources of information on healthy eating for elder European citizens.

Design: Cross-sectional survey using a face-to-face interview assisted questionnaire.

Methods: European citizens from Pan-EU Survey conducted by IEFS - Dublin**, n= 1843, aged ≥ 65, were interviewed. The data's descriptive analysis, was followed by univariate analysis to characterise the study sample. Results will be presented at the European level as well as for each country.

Results: Elderly get information on healthy eating specially from health professionals (31%) followed by the mass media (28.5%) (the main source used by other age groups). When the use of information coming from different sources is analysed, it is observed that the older age groups don't use written information as much as younger ones. Clearly, if access to sources of information is lacking (e.g. those who do not contact health professionals) information-seeking behaviour is likely to be frustrated or not even contemplated. 14,7% of elderly say they don't get any information on healthy eating, specially man and with low level of education. Data indicated less credibility on information coming from institutional levels (69.8% versus 80.8% in younger 15-24 yrs) and health professionals (88.6% versus 93% in younger 15-24 yrs) but decisions to act will be influenced also by the amount and type of information available and how it can influence the perception of risks and rewards involved in eating in a healthy way.

Discussion: European elderly seem to be a particular group in the way they search and use information. In a Europe changing in a fast way to a complex and technologically advanced communication system it is necessary to make food/nutrition messages accessible and adapted to the elderly, those more distant from this scenario.

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WHAT DO GERMAN SENIORS DRINK?

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The project aims at gaining information about the nutritional behaviour of the elderly. The data will be used as a realistic basis for modelling menu plans for healthy nutrition according to individual requirements.

The group studied comprised seniors between 65 and 75 years of age living in Baden-Württemberg in private households. 183 one- and two-person private household listed food and beverages consumed per day over a period of 2 x 6 weeks in autumn/winter 1993 and spring/summer 1994. The data obtained were analysed for meal structures and for the kind and frequency of food and beverages consumed.

The data concerning beverages are based on information from 82 one-person households. About 75% of 36 942 meals totally were accompanied by one or several drinks. The average frequency of drinking was 4.5 times per day. Coffee is on the top of the list of drinks (29%) followed by water/Mineral water (24%), tea (21%), juices/juice + mineral water (10%), wine/ sparkling wine (7%). 11% of the drinks consumed were alcoholic.

MIneral water, tea, juices and milk are consumed any time, while coffee is preferred for breakfast and in the afternoon. The calculated average fluid intake by drinks of 1.14 per day is below the daily fluid quantity recommended by DGE.

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ENERGY AND NUTRIENTS INTAKE OF ELDERLY PEOPLE LIVING IN THE WARSAW REGION, POLAND*

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Energy and nutrients intake of 298 persons, born in 1919-1924, randomly selected (144 men and 154 women) living in different areas of Warsaw region (city, small town and rural) were examined in spring 1999. The intake of basic nutrients, vitamins and minerals was determined by

the 3-day record method. General information about respondents (socio-demographic, economics and health data) was collected by personal interview. The intake of energy and nutrients was calculated for each subject and compared with the Polish recommended daily allowances. The significance of differences in mean values between subgroups was evaluated using an analysis of variance.

The average intakes of energy were 87-97% in men and 69-86% in women, comparing to the RDAs. In general, the examined groups of elderly consumed too little of the following nutrients: carbohydrates, fibre, plant protein, vitamin C, vitamins of group B (vit. B_2 in particular), calcium, magnesium, iron (in women), copper and zinc. The intake of fats, cholesterol, sodium and phosphorus was above recommend level. Many differences in nutrient intake were related to area of living. The lowest intake of energy, carbohydrates, fibre, vitamin C, calcium, magnesium, iron, copper and zinc was observed in women living in small town.

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THE NUTRIENT STATUS IN FREE-LIVING POPULATIONS OF ELDERLY WOMAN

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Objectives: To identify the nutrient status in a population of elderly woman.

Design: The study includes 135 retired woman, 63-86 yrs of age, single or non-single living.

Methods: Data according to nutrient and food intake was obtained by a 24-h dietary recall and a menu-book by interviewing the subjects in their home, repeatingly by a telephone interview, and by the subjects recording their food intakes during three consecutive days. Thus, a total of five days of data were analyzed.

Results: No significant differences were seen between the two assessment methods according to energy, selected nutrients or food intakes. The results indicate that the energy intakes are low in all age groups, but that the nutrient density in the diet in the age groups, respectively, is good according to the Swedish nutrient recommendations. The results showed that this population group distribute their food intake well throughout the day, including food items similar to those in younger age groups.

Discussion: The results from the present study indicate that elderly woman, still living at home are reporting a sufficient nutrient intake. However, the results indicate that woman > 83 yrs with a generally lower energy and nutrient intake, should be in focus in the general care of elderly, and in dietary councelling.

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HOW TO LOCATE GEOGRAPHICALLY NUTRITIONAL HABITS USING THE ZIP CODE AS INFORMATICAL BUTTON?

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It is well known that a difference in meal composition can or can't result in a different intake of nutrients. A very like method to establish nutritional habit of a people is the nutritional epidemiology. The currently used methods are: *a)* data of national statistical institute of reference (ISTAT in Italy); *b)* 24 hours and/or week nutritional recall cart, and *c)* frequency questionnaire.

Materials and methods: A few past years we published in a newspaper with big regional circulation «Il Mattino» a «24 hours recall dietary card» and inserting also a week frequency questionnaire. Contemporary, we distributed to all the patients who coming to our dietetic ambulance a «week recall dietary card» filled carefully reporting the weight of eaten food. Nutritional data were acquired in a Pentium II using FoodMeter e/or WinFood program by Bayer-Medimatica (Italy) that changed food in nutrient composition. All the data were located using Zip code as informatical button for geographical arrangement.

Results and discussion: In our studies, changes in meal patterns from one to other different geographical location are evident. Surprisingly, we found also changes between different district of the same town. Zip code, used as informatical button for geographical location, identifies exactly the life district of the subject. The aliments database of programs used is an oopen database. It is possible to modify the meal composition randomly, inserting new values of nutrient as new nutrients, vitamins or trace elements.

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CONSUMPTION OF FOOD PRODUCTS BY THE ELDERLY LIVING IN THE WARSAW REGION, POLAND*

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The objective of the study is to compare the intake of selected food products and groups of products by the elderly living in the urban and rural area of Warsaw region in Poland.

The study was carried out in April - June 1999 in a big city (Warsaw) and several villages. The study population consisted of 198 persons, 56 from Warsaw (32 men and 24 women) and 142 from the rural area (61 men and 81 women), born in 1919-1924. Mena BMI values were 27.3 for subjects living in Warsaw and 28.2 for persons from the villages.

Data on dietary intake of food products were obtained from 3-day food records.

The products were then classified into the following food groups: (1) milk and milk products, (2) eggs, (3) meat and meat products, (4) fish and fish products, (5) fats and oils, (6) cereal products, (7) vegetables, (8) fruit (9) sugar and confectionery, (10) beverages, (11) other products.

On the basis of the data, food patterns and frequency of food groups's consumption by the elderly from different living areas will be presented.

* The study was financially supported by the National Polish Science Funds (KBN) No 4P05D01713.

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FLUID INTAKE IN HEALTHY ELDERLY PEOPLE IN GERMANY

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Decrease of thirst is a known risk factor for dehydration in the elderly. Reliable data on fluid intake of older subjects in Germany are scarce. The aim of this nation-wide study was, thus, to assess total fluid intake (from beverages and food) of healthy, fairly independent elderly subjects living in private households.

From a random sample of 4020 German elderly, stratified into 3 age-groups (65-74 y, 75-84 y, 85+ y), 1372 subjects filled in a prospective, standardised dietary record on three consecutive days (Sunday-Tuesday). Fluid intake by beverages and food was calculated on the basis of the German nutrient data base BLS II.2, and given as average of the three days.

Median beverage consumption (5./95. percentiles) differed between the age-groups ($p< 0.001$): 1554 ml (667/2847 ml) for young elderly (n= 699), 1417 ml (628/2512 ml) for the age-group 75-84 y (n= 386), and 1300 ml (500/2307 ml) for the oldest old (n= 287). Men ingested 170 ml (median) more fluids than women (whole sample, $p<0.001$). Total water intake (whole study group: median 2305 ml [1263/3786 ml]) showed similar differences between age-groups/sexes. 67% of the elderly had a total water intake above 2000 ml per day. However, 2% ingested less than 1000 ml, 9% only 1000-1500 ml water per day, with highest prevalence among very olds: 4% <1000 ml, 14% 1000-1500 ml ($p< 0.001$).

In conclusion, median fluid intake by beverages and total water intake of the elderly met the actual recommendation for people aged 65 y and older (1310 ml/1990 ml). Only in the group of very old persons, a significant risk for dehydration is obvious.

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THE ¨FIVE-A-DA YS¨: SER VINGS OF FRUIT, VEGETABLES, AND POTATOES IN 12 SENECA CENTERS IN RELATION TO INTAKE IN GRAM, HEALTH VARIABLES, AND MEAL PATTERNS

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Objectives: Assessment of servings of fruit, vegetables and potatoes.

Design: Longitudinal study in men and women born 1913-1918 in traditional towns across Europe with field surveys in 1989, 1993, and 1999 (Eur J Nutr 50 Supl 2; 1996).

Methods: Servings of fruit, vegetables and potatoes were assessed on the first day of a 3-day food diary recorded by 1182 subjects in 12 study towns.

Results: Eighteen percent of the subjects had five or more servings per day and forty-two percent two or less. The mean numbers of servings in the different study towns correlated significantly to mean intake in gram. From the regression line we calculated the amount of one serving: 137 g for fruit, 135 g for vegetables and 196 g for potatoes.

Mean numbers of serving correlated significantly with antioxidant status whereas mean intake in gram did not. The mean number of servings was highest in towns, where lunch always consisted of a cooked meal, and in the Danish and Dutch town it was higher for subjects having a cooked meal at lunch than for subjects having a bread meal at lunch.

Discussion: As numbers of servings correlated to the antioxidant status, the easier method of counting servings seems appropriate for health recommendations.

The fact, that a cooked meal at lunch mediates higher consumption of fruit, vegetables, and potatoes, should stimulate more research on meal patterns.

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THE EVA-STUDY: MEAL PATTERNS OF WOMEN OVER 65 YEARS

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Objectives: What are the meal patterns of elderly women? How is eating and drinking integrated in every day life activities?

Design and methods: In a qualitative biographical study on eating behaviour of 60 elderly women (64 to 94 years) 43 women kept 3 days dietary records, activity and «mood» protocolls. A total of 592 meals were analysed in respect to meal patterns, duration of meals, timing of meals and nutrient content.

Results: On average each woman consumed 4.8 meals daily. The main meal is a cooked lunch (starch-vegetable-meat pattern). Bread with jam or honey is the most common breakfast pattern, bread with cheese and sausage is predominantly consumed at dinner. Duration of meals (averages): breakfast 33 min., lunch 36 min, dinner 34 min. Time of meals (averages): first breakfast 8:10, second breakfast 10:20, lunch 12:30, coffee 15:45, dinner 18:50, late evening snack 20:40. Nutrition related activities (producing, shopping, cooking, storing, cleaning etc.) sum up to a total of 4 hours 15 min daily (averages), which is an equivalent of 27% of total daily activity.

Discussion: Nutrition councelling and education of elderly women has to be based on the knowledge of their meal patterns and food related daily activities.

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THE EVA-STUDY: NUTRITION BEHAVIOUR IN THE LIFE COURSE OF ELDERLY WOMEN

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Objectives: How is eating behaviour aquired during the life course? Which biographical factors are detrimental for eating behaviour?

Design and methods: Sixty women (64 to 94 years) were interviewed using qualitative biographical methods. Interviewees lived in an urban area in proximity to Frankfurt/M, Germany, independently in their homes. All interviews were transcribed verbatim and analysed using descriptive hermeneutic procedures.

Results: Socialisation of eating in childhood was either conservative or liberal. Varieties of foods offered during childhood were splendid or scarce. Following the life course, four «eating types» were found: «conservative-splendid», «conservatine-scarce», «liberal-splendid», «libera-escarce». During the life course changes of the «eating type» did occur only: in case of marriage (if partner had a different eating type), in case of illnes (partner or self), in case of fear of illness.

Discussion: Distal influencing factors such as socialisation during childhood are shaping present today eating behaviour. Nutrition councelling of elderly women has to acknowledge their present «eating types» as well as life course events and subsequent influences on eating behaviour.

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EFFECT OF DIETS RICH IN MONOUNSATURATED OR SATURATED OILS ON 6-KETO $PGF_{1\alpha}$ AND THROMBOXANE B_2 FORMATION IN AGED WOMEN

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High intake of saturated fatty acids (SFA) is associated with arterial thrombi formation, while monounsaturated fatty acids (MUFA) are described to have no effect on arterial thrombosis. However, few related studies have been carried out in postmenopausal and aged women. Moreover, platelet thromboxane (TX) production is modulated by the lipoprotein concentration (mainly LDL), while prostacycline (PGI) production is related to the HDL level. The present study analyses the effect of dietary exchange of high oleic acid sunflower oil by palm olein on the urine excretion of TX and PGI in old (65-76 y) *vs* young (45-< 65 y) postmenopausal women. Both diets contained 46% of energy as fat. Other dietary compounds were matched. 10% of total energy exchange as palmitic acid for oleic acid significantly increased ($p< 0.05$) both the concentration of PGI_2 determined as 6-keto $PGF_{1\alpha}$ and TXB_2. The TXB_2/6-keto $PGF_{1\alpha}$ remained unchanged in the whole population. These results seem related with the controversial effect of palmitic acid on the total cholesterol and LDL and HDL lipoprotein fraction levels (Cuesta et al, 1998, Eur J Clin Nutr, 52, 675-683). Moreover, ANOVA two ways shows that diet and not age significantly affect the thrombogenic parameters studied.

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THE EFFECT OF PLANT AND FISH FAT ON THE CONTENT OF FREE AND TOTAL MALONDIALDEHYDE AND VITAMINE E IN LIVERS OF YOUNG AND ADULT RATS

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Objective: The aim of the study was to estimate malondialdehyde (MDA) synthesis and vitamin E concentration when plant or fish fats were given.

Materials and methods: The MDS synthesis was investigated in male Wistar rats which were given rapeseed oil and olive oil by intragastric intubation. Both oils were warmed during 15 or 30 min. at 200 °C. The MDA content was measured spectrophotometrically in liver microsomes and serum after reaction with 2-thiobarbituric acid. Animals used in that study were 5 and 9 months old. The influence of various fats, such as eybean oil, fish oil, evening primrose oil as well as mixtures of evening primrose oil and fish oil (8/15.5) and fish oil and soybean oil (8/15.5), were also studied. They were given for 6 weeks to young (5 month old) and

adult (12 month old) rats in the amount of 0.4 ml daily. The content of free and total MDS and α-tocopherol in liver was determined by HPLC.

Results and discussion: Received results show that there is a clear correlation between the kind and quantity of PUFA present in the diet and possibilities of synthesis of free or protein-bound MDA. The animals'age was possitively correlated with these alterations. An increase of the protein-bound MDA can be connected with the animals' age as well as with vitamin E concentration. However, in large degree it depends on the kind of fat. Fish oil appeared to have the weakest effect of all investigated oils on MDA gathering in organism.

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VALIDITY AND APPLICABILITY OF A FOOD RECORD TO MONITOR ENERGY AND FLUID INTAKE OF GERIATRIC PATIENTS BY NURSING STAFF

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A food record to monitor the energy and fluid intake of geriatric patients is used by the nursing staff of the geriatric ward at the University Medical Center St. Radboud, Nijmegen, The Netherlands. The validity and applicability of the food record was evaluated in january 2000.

Sixty food records of geriatric patients were kept by 37 nurses. Two dietitians simultaneously observed the food and beverage intake (weighed record) of the same geriatric patients. Nurses were asked (questionnaire) if the food record was user friendly. Results of the data (n= 60) observed by the nurses and the dietitians are as follows: The mean energy intake registered by nurses was 1183 ± 504 kcal and the fluid intake was 1285 ± 451 ml per day. The dietitians measured 1336 ± 495 kcal and 1395 ± 497 ml per day.

The correlation (Pearson) between the data on energy (r = 0.6) and fluid intake (r = 0.6) as registered by nurses and dietitians proved to be significant ($p < 0.01$). The difference (Student-t) between the two data sets gathered by the nurses and the dietitians was also significant ($p< 0.05$): energy (t = 2.5) and fluid (t = 2.9).

Food records kept by nurses show a lower energy and fluid intake than the records kept by the dietitians. The food record was shown to be insufficiently friendly to the user. Location and categorization of certain specific food items was difficult. Some items could not be allocated at all.

The food record has been redrawn according to the comments of the nursing staff and a user manual has been developed. The revised record will be reassessed in the near future. The system should eventually become extremely useful as an instrument to monitor the nutritional intake of the geriatric patient. Nurses will be aware of the nutritional status of their patients and ask for dietetic intervention at the right time.

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NUTRITION IN THE INSTITUTIONALIZED ELDERLY

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Objective: The main purpose of this study was to investigate the status of health and the effects of food consumption on elderly in Geriatric Center in Kragujevac because it is known that they do not have enough money to by supplementary food and medicine.

Design: Two hundred and sixty old people both sex investigated in direct interview but only some of them could cooperate because of most of them were immobile and sick In this interview participated 43 women and 19 men.

Methods: The data of every old people obtained using the inquired method and dietetic investigation with direct method of interview and the existing evidence in the object of nutrition was done as well. The standard two weekly manu was followed with daily rhythm of nutrition per meals and the biochemical and nutrients composition of food and meal rate in the structure of daily meal were also investigated.

Results: The results of investigation showed that average body weight for female was 68 kg, 70 ages that was 26% illiterate and only one had faculty (2%). The average body weight male was 72 kg and 68 ages and was 11% illiterate and one had faculty (5%). One man was refuges 24 ages old. Daily rhythm of nutrition was three meals except people with diabetes who had six meals. Energy intake was satisfactory but animal protein and some vitamins were insufficient because the lack of fresh meat, vegetables and fruits. Because of their ages, bad terms living and unproper nutrition they have a lot of diseases as diabetes, infarct, gastric-intestinal diseases, osteoporosis, anemia, hypertension and cardio-vacular diseases.

Discussion and conclusion: According to the given data it was concluded that nutrition of the old people was inadequate and the health was bad. However in last time during two months nutritionist was employed and could be expect better situation with elderly and it is reason what this investigation could be done.

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DAIRY PRODUCT CONSUMPTION OF ELDERLY PEOPLE OF BARCELONA, SPAIN

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Objectives: To assess lifestyle, food habits and dairy product consumption of the elderly (> 65 years) living in the city of Barcelona.

Design: A transversal study from a group of 270 females and 212 males from 65 to 100 years of age (in May-June of the year 2000) and living in the city of Barcelona. 218 of the people were nursing home residents and the rest, 264, were interviewed at the street.

Methods: The personal interview included a general questionnaire with questions including age, sex, family status, physical activity, medication, health, eating habits. The food consumption data were collected by a semiquantitative food frequency questionnaire of 46 items (8 of which were milk and milk products).

Results: Preliminary results show that the average age was 78.7 ± 8.9 years. 49,8% were following special diets (mainly low in sodium and sugar). 9.1% were taking nutrient supplements. Most of the people (95%) reported drinking milk daily. Regarding the type of milk they usually drink: 33.8% whole milk, 32.6% lowfat, and 28.6% skim/nonfat milk.

Discussion: Most of the elderly of Barcelona (82.1%) covered the recommended daily servings for milk and milk products (2-3 per day).

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ASSESSMENT OF DIETARY ADEQUACY FOR AN ELDERLY POPULATION BASED ON A MEDITERRANEAN MODEL

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Objective: To assess if at different energy levels, a varied diet based on Mediterranean Diet patterns would meet the RDIs for specific nutrients in a population > 65 y.

Methods: Based on RDIs for elderly persons > 65 y for PRO, FAT CHO, phosphorus, calcium, magnesium, iron, zinc, vitamin C, B6, folate and fibre, menu models based on Mediterranean diet food patterns were calculated for the following calorie levels: 1400, 1500, 1600, 1700 and 1800 kcals. 15 menu variations for each calorie level were then created based on the previously calculated models utilising the Program for Alimentation and Nutrition (PAN) database, nutritional analysis was carried out for all menus and the mean nutrient values for a 2 week period were calculated for each calorie level.

Results: Preliminary results show that at low energy levels, meeting nutrient needs is difficult and even at higher caloric intakes, contrary to what was expected, certain nutrients are found to be inadequate.

Discussion: This analysis confirms that the elderly are a population especially vulnerable to nutritional deficits, as energy intake declines with age but nutrient requirements remain unchanged.

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EFFECT OF MONOSODIUM GLUTAMATE ADDED TO FOOD, ON IMMUNOLOGICAL PARAMETERS OF INSTITUTIONALIZED ELDERLY

Posters

Other issues

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To evaluate effects of addition of a taste enhancer substance (Monosodium glutamate MSG) to food, on nutritional status and on immune response parameters, two groups (n=30) of institutionalised elderly (> 60 years) living in a geriatric home were studied. Complement fraction 3 (C3) and immunoglobulin A (IgA) were measured by nephelometry, tumor necrosis factor (TNF) by ELISA, lymphocyte percentage (Lympho %) by automated method, CD3, CD4, CD8 subpopulations by flow cytometry. CD4/CD8 ratio was calculated. Group A received 0.6% MSG in two food preparations at lunch (5 days per week) during three months. Group B received the same diet with no MSG addition, during the same period. Lunch contributed with 40% of the total calories per day, and protein intake was adjusted to recommendations. Age and sex distribution of the elderly was similar.

In group A, significant increases of C3 (t= –2,1, p= 0,04), IgA (t= –2,2, p= 0,03) and TNF (t= –2,2, p= 0,03) were noted at the end of the MSG administration period. There were no significant differences in Lympho%. Group B also showed higher values of IgA (t= –1,6, p= 0,01), TNF (t= –3,0, p= 0,01) and Lympho% (t= 3,8; p= 0,001). There was an increase of cellular immune response indicators among group A elderly and there were significant differences in CD3 (t= –2,6; p= 0,01) and CD4 (t= –1,9; p= 0,05) between the beginning and the end of the MSG period. In group B, increases for CD3 (t= –2,9; p= 0,006) and CD8 (t= –2,1; p= 0,04) were also seen in the elderly that were not receiving MSG.

In an institutionalised elderly population, introduction of a new menu with different food preparations may be, by itself, a very powerful stimulus to favour food intake. Immunological parameters were observed to increase independent of MSG addition to food. In both cases there was an improvement of the immune response. This must be evaluated in terms of its biological meaning in order to separate dietary influence from the real effect of the taste enhancer. Other studies controlling this stimulus are required. Funded by: CDCH, Universidad de Carabobo, Venezuela and International Technical Committee for Glutamate, Japan.

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THE REPRODUCIBILITY OF A DIETARY RECORD REOTINE IN GERIATRIC PATIENTS

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Objetives: Malnutrition in nursing home residents is an important clinical and public health problem. Knowledge is lacking about the reproducibility of dietary recording in geriatric patients. Few studies have described water intake in this age group. The aim of this study was to test the reproducibility of a 7-day dietary record routine in a clinical setting.

Design and methods: The dietary intake of 81 geriatric patients was recorded for 7 consecutive days by the ward staff and then repeated. The dietary record routine, which assesses both food and fluid intake, is based on standardised portion sizes and household measurements.

Results: The mean daily energy intake during the first period was 7.07 MJ and 6.84 MJ during the second period, with a mean difference of 4%. Corresponding values and the mean difference for water intake from food and beverages were 1781 g, 1702 g and 4% respectively. Age, gender, diagnosis, length of stay, diets or ADL function did not influence the results. The correlation coefficient for fluid intake between the periods was 0.84 for women and 0.72 for men.

Discussion: The 7-day dietary record routine seems to have a good reproducibility in assessing the intake of energy and fluids in geriatric patients.

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NUTRITIONAL ASSESSMENT OF ELDERLY PEOPLE IN NURSING HOUSE AND AT HOME IN TALLINN

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Introduction and Methods: Mini Nutritional Assessment (MNA) has been carried out with 51 elderly (aged 51-97 years) at the nursing home Merivälja and with 150 home-.living elderly (58-86 years old). In the nursing house the actual nutrition (by menus in 10 days intervals in January and April 2000) of 105 elderly was calculated with the ANKE-PC-program. It has been compared with the nutrition data of the same Merivälja-home in 1978 and home living retired (1995).

Results: showed that the total food energy was much more higher than recommended, depending on highly planned carbohydrate (from cereals and sugar) content - 57-63% of total food energy (in 1978-46%). In 1978 predominated more animal foodstuffs as main protein (60%) and fat sources (87%) than in 2000 (41-46% and 64-74%). P/S ratio has achieved 0.5 and dietary cholesterol has decreased (187 mg/d). Minerals and vitamins met recommended level, expect calcium and vitamin D.

The risk of malnutrition (MNA score < 17 or 17-24) was found with the same frequency as in the elderly living freely at home (26%) as in the nursing house (27.5%). Comparison of MNA results with BMI values showed that 10-22% of the elderly with high BMI (> 25) were at malnutrition risk estimated with MNA (by threshold value of risk < 24).

Conclusion: over 20 years interval there was only a modest improvement in choice of healthy foods for elderly at the nursing home. It is not enough to calculate dietary data for estimating real nutritional status of the elderly. MNA detected more often the risk of malnutrition than the BMI. Malnutrition risk has to be considered much more in provision of food and nursing of elderly in elderly houses and at homes as well.

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ACUTE-PHASE PROTEINS IN NUTRITIONAL ASSESSMENT OF ELDERLY OVER 65 YEARS

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Introduction: Protein-energetic malnutrition (PEM) is common problem in elderly. Albumin and transferrin are negative acute-phase proteins (APP) and are well documented in nutritional assessment of elderly. The role of the outers APP isn't clear. AIM: The aim of this study was to investigate the plasma levels of some APP in different nutritional stages in elderly over 65 years.

Method: In 50 elderly (age 76 ± 9.3) with primary PEM (according to clinical-athropometric criteria) were obtained (with turbidimetry): C-reactive protein (CRP mg/dl), α1-acid glycoprotein (α1AG g/l), fibrinogen (Fib g/l), haptoglobin (Hap g/l), C3 (g/l), C4 (g/l), albumin (Alb g/l) and transferrin (Tr g/l); and compared with 41 healthy elderly (according to SENIEUR protocol) age 74 ± 8.7).

Results and disscusion: Alb (2.85 ± 0.9), Tr (1.81 ± 0.4) and Fib (2.69 ± 0.9) were significantly lower in PEM than in SEN (4.73 ± 0.6, 2.84 ± 0.5 and 3.17 ± 0.8, respectively). CRP (0.0-7.1) and α1AG (1.93 ± 0.5) were significantly higher in PEM than in SEN (0.0-2.7, 1.09 ± 0.4, respectively) whitch suggested that in PEM there are some changes in acute-phase reaction. Some investigators suggested that geriatric cahexia is cytokin-induced. After correction for the level of CRP, there was a significant correlation between Alb ($r = -0.67$, $p < 0.05$), Fib ($r = -0.51$, $p < 0.05$), C3 ($r = -0.42$, $p < 0.05$) and Hap ($r = -0.38$, $p < 0.05$); and quantitative state (mild, moderate and severe) of PEM.

Conclusion: Various APP have different meaning in nutritional assessment of elderly over 65 years.

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EFFICACY AND TOLERANCE STUDY ON A COMPLETE NUTRITIONAL SUPPLEMENT SPECIFIC TO DIABETIC PATIENTS

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The elderly are a population group with a high risk of suffering malnutrition due to various causes. Incidence of type II diabetes is high in this group: it may impede administration of nutritional supplements and thus preclude an optimum nutritional state. And the diabetic product composition is changing following the international consensus update.

Objective: Evaluate whether use of a liquid, complete and specific nutritional supplement achievs better control of postprandial glycemia in elderly diabetics than use of a standard supplement.

Material and methods: This is a prospective, cross-over, double-blind study in 22 hospitalised patients (7 □ and 15 □), over 65 years of age (mean 81.5 years), type II diabetics under different treatments (9 ID, 8 NID and 5 diet).

Two liquid supplements were administered: supplement A, specific to diabetics (3 g monoinsat, 1.4 g polyinsat, 1.2 g sat, free of saccharose with fructose and starch and 4 g soluble fibre per 200 ml dose) and a standard, product B (1.2 g monoinsat, 3.0 g polyinsat, 0.8 g sat. with saccharose and without fibre). Each supplement was administered on one day in different weeks as a mid-afternoon meal; the remaining diet was comparable. The patients were randomised: one group took supplement A on the first day and B on the second; the other group took the supplements in reverse order.

Glycemia was monitored for patients before administration (baseline) and at one and two hours. The area under the curve was calculated. Gastric tolerance and organoleptic acceptance were also determined. Paired comparison of the different treatment groups was performed by the t Student test for paired data.

Results: One patient was excluded on their own decision. Baseline glycemia levels did not present statistically significant differences between the two groups (A: 168.80±41,84 and B: 197.28± 71.59; p= 0.07). Differences were found between the values at 1 hour (A: 195.80± 45.83 and B: 244.52± 63.08; p= 0.002) and at 2 hours (A:181.47± 39.00 and B: 226.42± 75.74, p= 0.004).

The glycemia area under the curve was, for A, 370.26± 80.21, and for B 456.38± 129.80, with a significant difference (p= 0.004). Tolerance and acceptance were good in 2 cases.

Conclusions: Use of specific supplements for type II diabetes patients allows for better postprandial glycemic control in the elderly, with optimum digestive tolerance and acceptance. This supplement type would be preferable if nutritional supplementation were required in elderly diabetics.

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RELIABILITY OF RESPONSES TO NUTRITION-RELATED QUESTIONS IN PEOPLE OVER 75Y

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Objective: To assess the test-retest reliability of responses to 101 nutrition-related questions which are under consideration for inclusion in a nutrition screening tool.

Design: Observational study of 29 men and 29 women over 75y selected from a general practice in Aberdeen.

Methods: The questions covered areas of motivation, diet and disability, including the EASY care Elderly Assessment System. They were administered by an interviewer in the subjects' homes, and repeated by the same interviewer 2-3 weeks later. Test-retest reliability was assessed by Kendall's Tau B for non-ordered variables and the intra-class correlation coefficient (ICC) for ordered variables.

Results: The reliability of most questions was good with 77 of the 101 questions having values for Kendall's Tau B or ICC more than 0.50, of which 33 were more than 0.80. Highest reliability was found for the overall EASY score and diet supplement use. Questions with poor reliability included some questions on motivation levels, appetite, weight loss and fruit and vegetable intake.

Discussion: Information on reliability was useful in the development stages of producing a valid nutrition screening tool. For some questions with poor reliability minor changes in the phrasing were made to improve clarity. The reliability of each question will be used together with its ability to predict biochemical deficiency of key micronutrients in the selection of appropriate questions for a nutrition screening tool.

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PREDICTIVE VALUE OF SERUM ALBUMIN IN PATIENTS ADMITTED TO THE MEDIUM-STAY UNIT (UME) WITH FRACTURE OF THE HIP

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Objective: To analyse nutritional biochemical parameters for functional recuperation in patients admitted to the UME with fracture of the hip, and the influence of these parameters on the results.

Material and methods: The study covered 212 patients, 34 male and 178 female, with an average age of 82. Various different biochemical parameters were determined at admission (haemoglobin, lymphocytes, total cholesterol, albumin and transferrin) and related to physical and mental disabilities recorded previously, on admission and on release, measured by the Red Cross scale. They were also related to the average stay and complications that required transfer to the hospital for acute patients. The statistical analysis was performed using SPSS.

Results: of all the data analysed, only albumin was associated with other variables. The average age of patients presenting less than 3.5 gr/dl was higher (p= 0.003). There was no difference in previous disabilities or disabilities on release, but on admission, patients having low abumin presented greater disability (p= 0.019). Of this group, more were transferred to the acute patients hospital (p= 0.02) and the average stay was longer (p= 0.02).

Conclusions: In patients treated for fracture of the hip, where albumin levels were low more time was required to achieve functional recuperation and there were more instances of transfer for intercurrent disorders.

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NUTRITIONAL RISK IN THE POPULATION COVERED BY THE HOME HELP SOCIAL SERVICE (SAD)

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Objective: To ascertain the risk of malnutrition in the population receiving assistance from the SAD and its relationship with other parameters of geriatric evaluation.

Materials and methods: Prospective survey based on a questionnaire and personal interviews with the nursing staff.

Details recorded were affiliation, socio-family resources, state of health and functional and mental condition, using Barber, Barthel, Lawton and Pfeiffer. The method used to study nutrtional risk was the one recommended by «The National Health Screening Initiatives» (determine your nutritional health). 103 questionnaires were completed and the data were analysed by SPSS.

Results: The average age of the subjects of the survey was 81 (St: 7.17), of whom 90% were women aged over the average (81.5 versus 75, p= 0.003). All except one were at risk according to the Barber test, with an average score of 3.55 (St: 1.56). The other averages were 83 for the Barthel scale (St: 21.5), 5.22 for the Lawton test (St: 2.56) and 1.4 for the Pfeiffer test. In the nutritional test over half (59%) were found to be at risk (36% moderate and 23% high), but here was no correlation with the age of the person concerned. Statistically significant values were found in the relationship between nutritional risk and Barber (p= 0.09), particularly the first 6 items, Barthel (p= 0.000), Lawton (p= 0.000) and Pfeiffer (p= 0.009).

Conclusions: Besides general risk, the population attended by the SAD presented a high percentage of nutritional risk, relating to ther functional and mental condition.

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HIGHER SENSITIVITY OF PPARα GENE EXPRESSION DUE TO NUTRITIONAL CHANGES IN LIVER OF SUCKLING RAT COMPARED TO ADULT RATS

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Peroxisome proliferator-activated receptor (PPARα) is a nuclear hormone receptor which, after fatty acid induction, acts as a transcriptional factor regulating the expression of genes related to lipid metabolism. To determine whether nutritional changes could affect both expression and activity of this receptor, different compounds were administered to rats: glucose, Intralipid, glucose plus Intralipid or medium alone. Further, in order to ascertain if the observed changes were aging-related, the experiment was carried out using both 10-day-old neonates and adult rats (3 months of age). Liver mRNA levels of PPARα and its putative target genes and plasma metabolites were measured. In neonates, the expression of PPARα was increased when the level of FFA in plasma was high, but such induction was attenuated when the level of insulin was also augmented. However, these profound nutritionally-induced changes were not detected in adult rats. The response of peroxisomal acyl-CoA oxidase (ACO) expression to the treatment was also greater in neonates than in adult rats. On the other hand, regarding the expression of phosphoenolpyruvate carboxykinase (PEPCK), a similar increase was found after administration of Intralipid or after 5 hours fasting in both neonates and adult rats.

Thus it may be concluded that the expression of the PPARα gene in adult rats seems to be less sensitive to hormonal and nutritional changes than in neonates.

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PATTERN OF HEALTH SERVICES FOR A POPULATION OF ELDERLY WORKERS

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Steel Mil «Huta Sendzimira», employed appx. 17.000 workers. Many of them worked whole their occupational live, sometimes more than 25 years, in poor hygienic conditions.

Recent recession in the metallurgic industry, leads to layout of many younger workers. Those in the span from 60 to 65 years (age allowing men in Poland to go retired) have possibility to receive special kind of temporary pension until 65-th year of age.

All the time, also after stopping regular work, they may seek medical advice at the County Industrial Health Centers. All the time they may claim for compensation due to suspected occupational diseases. During the years 1994 - 97, 1396 claims for compensation were registered. Eventually of this number 851 cases were diagnosed and approved as occupational-related disease. 481 cases (56.5%) were diagnosed as pulmonary diseases. In this group, 225 cases (46.7%) were diagnosed ad silicosis, 138 (28.7%) as chronic bronchitis, 36 subjects (7.5%) had asthman, 23 (4.8%) asbestosis and 59 cases suffered lung carcinoma. 1/3 of occupational-related cancer cases were diagnosed in sexagenarians, several years after stopping their work in industry.

Pensioners of «Huta Sendzimira» attend to the dedicated Health center where they are convered by several prevention programs. The most important are: intolerance of glucose, hipercholesterolemia, hipertriglycidemia and prostatic cancer.

Efforts are made to extend prevention set of diagnostic tests for occult blood in stool in order to establish basis for early diagnosis of gastrointestinal cancer.

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ANALYSIS OF DIAGNOSTIC PARAMETERS IN THE GROUP OF ELDERLY NONINSULIN DEPENDENT DIABETICS

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Insulin-independent diabetes mellitus (NIDDM) is common in older people. Some patients, despite many years of presence of illness never have diabetic complications. In the present study in the group of 10 patients (5 women and 5 men), 64 to 89 years old (mean 78.4± 8.1) with NIDDM without diabetic complication were investigated. Ten healthy subjects served as the controls.

28 parameters including Total Antioxidant Status /TAS/, albumin, bilirubin, uric acid, iron , glutathione peroxidase and selenium in blood plasma were measured.

In the group of diabetics significantly lower level of uric acid compared to controls has been observed, whereas no significant differences between albumin, TAS and bilirubin were detected. A significant correlation between uric acid level and TAS has been found. Pattern

recognition methods were used to analyse multivariate data i.e. to reduce dimensionality of the diagnostic parameter data set, extract the most relevant features and find correlation between various types of parameters. In the study group reduction of the original set of diagnostic parameters (28 parameters) was obtained by the principal component analysis (PCA). The most relevant were: urea, glucose, ALAT, LDL-cholesterol. Two outliners revealed by PCA had the extreme values of many original parameters. In the whole group (the study and control group combined) the only common parameters were: TAS, albumin, bilirubin, uric acid, iron. These parameters were used in PCA. This enabled us to find clear distinction (in newly created coordination system) between study and the control group.

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COGNITIVE STRATEGIES OF U.S. ELDERLY FOR REPORTING AMOUNTS EATEN DURING 24-HOUR DIETARY RECALLS

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Memory processes are important when individuals report food and amounts eaten during dietary recalls. The cognitive strategies that are used during this process must be considered in designing interview procedures that help improve recall. However, these strategies are not well understood in the elderly. We studied strategies for portion size estimation in 24-hour recalls when different types of aids are used. Interviews were conducted in 3 U.S. states with 118 adults, age 65+, from two ethnic groups and both genders. Subjects were divided into 4 study groups, each using different aids: 2-dimensional, 3-dimensional, photographs of measuring utensils, or photographs of foods. Foods eaten the day before were listed by participants and a variety of types of foods, i.e. solid, liquid, and amorphous, were selected by the interviewer for probing. Respondents were asked to think-aloud as they reported how much they ate of each food. The elderly typically used structured memory processes to recall how much they ate. They appeared to be very knowledgeable about the amounts eaten, with «known amounts measured or previously measured» as the most frequently used cognitive strategy. Whether their supposed knowledge corresponded to a high level of accuracy needs to be further investigated. Because these elderly appeared to have broad food preparation experience and kept track of amounts eaten because of special diets, response choice for the elderly were quite different from those seen in studies with younger persons.

When aids were used, which was seldom, those that resembled an item found at home were preferred to pictures or drawings.

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DIETARY INTAKE OF CALCIUM, MAGNESIUM AND PHOSPHORUS IN ELDERLY POPULATION USING DUPLICATE DIET SAMPLING VS FOOD COMPOSITION TABLES

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The aim of this study was to estimate the dietary intake of Ca, Mg and P in the elderly institutionalized population using duplicate diet sampling and to establish any related difference with the results obtained using food composition tables.

The study was carried out on a sample group of 112 institutionalized subjects in Granada (Spain), 87 females and 25 males (mean age 83± 7 years). 1-week food duplicate samples offered by the elderly were studied. Ca and Mg were determined by AAS and P was determined by spectrophotometry.

	Ca (mg/day)	*Mg (mg/day)*	*P (mg/day)*
Measured	997 ± 220	163 ± 26	951 ± 178
Tables	1,043 ± 241	217 ± 33	1,112 ± 226

ANOVA showed significant differences (p< 0,05) in all the minerals analised. These results suggest that the use of food composition tables is not suitable to evaluate the Ca, Mg and P intakes in nutritional trials. Moreover, the results show clearly that it is essential to consider these differences to establish the adecuate intakes of Ca, Mg and P for the elderly population, in relation to the mineral bone status.

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ECONOMIC STATUS, NUTRITION AND FREQUENCY OF METABOLIC COMPLICATIONS IN SUBJECTS OVER 65 YEARS OF AGE

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Economic prosperity affects the way of nutrition, nutritional status and health complications.

Novi Sad is the capital of Vojvodina, an extremely agricultural area in North part of Yugoslavia.

Totally, 400 persons of both sexes were invited, aged 65 and over in the period 1994-96. The response was 85.5%, and so the sample included 342 persons (males 50.29%, females 49,7%). Investigated health disorders are included in metabolic syndrome X.

41.86% were obese, and 26.74% M persons were extremely obese. Obesity was determined in 38.82% and extreme obesity in 36.48% F. Waist-to-hips ratio (WHR) with values from 0.8-1.0 was determined in 81.4% M and 34.12% F; WHR higher than 1.0 in 15.2% M and 0.59%. Fasting hyperglycaemia was found in 43.02% M and 37.06% F. Total serum cholesterol higher than 5.2 mmol/l had 85.81% M and 91.18 F. Decreased values of HDL cholesterol were determined in 54.06% M and 44.7% F. Risk for syndrome X was 23.1% persons of both sexes of this age.

The average pension in Serbia during this period was from 40 DM to 222 DM. Energy intake was from 2545-2817 kCal/day and fat content from 32.34% to 32.91%.

Such high prevalence in investigated characteristic of syndrome X constituents can be explained by traditional nutrition of population in Vojvodina (high energetic intake and high percentage of fats), but also by increasingly bad economic status of whole population, particularly elderly people.

Key words: Economic status, nutrition, health disorders, syndrome X, elderly people.

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PREDICTIVE VALUE OF NUTRITIONAL AND FUNCTIONAL VARIABLES IN A COHORT OF ELDERLY HOSPITALIZED PATIENTS

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Elderly people use health services 3 to 4 times more often than general population. Outcome of hospital stay and rate of re-hospitalization are dificult to predict. In short term follow up studies, advanced age, mental or functional deterioration have been shown to predict unfavorable outcomes. In this study we look at such variables as well as several nutritional status markers in a cohort followed during 5 years in terms of risk of death and risk of readmission.

Patients and methods: The cohort was integrated from august 1994 to june 1995 with patients older than 70 that had a length of stay above 7 days, were not in the emergency or intensive care units and were assessed by the geriatric team within 24 hours of admission. 118 patients were originally considered. 60 received full assessement: comprising a geriatric multidimensional evaluation (including Katz and Lawton scale's and Pffeifers's SPMSQ), anthropometry, pre-albumin, cholesterol and blood count (at admission and before discharge). Univariate and multivarite analysis were performed and survival and readmission rates were calculated with Kaplan-Mayer curves. Significance was determined with the Wilcoxon's method.

Results: Low Hb at admission (< 11.8) and one week after admission (< 10.6) are predictive for readmission in univariate analysis. To this results, low prealbumin (< 21) or cholesterol (< 158) values are added when a multivariate analysis is performed. Low prealbumine at admission (< 21.1) and lymphopenia (< 1582) are predictive of mortality as is a low score in the Pfeiffer SPMSQ.

Association of low prealbumine values and a low Pfeiffer's score increase significantly the mortality risk.

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EVALUATION OF THE VALIDITY AND THE RELIABILITY OF SIMPLE NUTRITION SCREENING TOOLS ADAPTED TO THE ELDERLY POPULATIONS IN HEALTHCARE FACILITIES

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This study was conducted to develop timely, valid and reliable tools to screen the protein-energy malnutrition (PEM) risk among the elderly populations in healthcare facilities. An initial screening tool made up of nine PEM risk factors was previously developed and attempted at validation. The tool was administered by a dietetic technician to 106 elderly inpatients aged ≥ 65 and divided into two categories: acute care (AC) and long-term care (LTC).

The results of the tool were compared to those of in-depth nutritional assessments carried out by dietitians. This tool didn't produce the validity indices desired (sensitivity, specificity and overall predictive value ≥ 80%) and was quite complexe. A stepwise regression analysis determined significant risk factors (p≤ 0.05) among those included in the tool. These were used to develop more simple screening tools. A first one included Body Mass Index (BMI) and % weight loss over time and another one included BMI and albumin. These tools classified subjects in low or high PEM risk levels. The validity of the simple tools was determined again with the same population and provided results ≥ 75.9%. The study was repeated in a different healthcare facility in a sample of 160 elderly subjects also divided in AC (n= 80) and LTC (n= 80) categories. At that time the simple tools were administered by a dietetic technician and by a nurse in order to assess temporal and spatial reliabilities. The reliability scores were between 70.8% and 88.9%. Simple tools will now be available for screening efficiently the PEM risk among the elderly populations on a healthcare facility-wide basis.

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EXCESS FAT-DIET INDUCED CHANGES IN HEPATIC AND INTESTINAL LEUCINE AMINOPEPTIDASE

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There is evidence that diets with excess fat promote the development and maintenance of obesity, disease that has become an epidemic and affects particularly to elderly people, and it is associated to numerous co-morbidities frequents at this age (diabetes, atherosclerosis...).

The aim of this work was to examine the effect of a high intake os saturated fat on the activity of intestinal (because the intestine is the first barrier of digestive-absorptive process) and hepatic (key organ in metabolism) leucine aminopeptidase (LAP) by the method of Goldbarg & Rutenburg, 1958.

Adult male Sprague-Dawley rats were divided into three groups: one control that was fed during 8 weeks with a standard diet, other fed 8 weeks the standard diet supplemented with a 20% of saturated fat. The last group received the 20% fat diet during the first 4 weeks and standard diet the remaining 4 weeks. The food intake was also controlled and no significantly variations were observed.

The results of enzymatic activity are shown in the table:

Leucine aminopeptidase (nmol β-naphtylamide/mg protein/minute)

Group	*LAP Intestine*	*LAP Liver*
Control	84.24 ± 11.84	8,49 ± 0.98
FAT	81.46 ± 18.01	8.59 ± 1.80
FAT-Control	50.12 ± 15.91[a, c]	10.29 ± 0,56[a, b]

Significantly different from corresponding: Control group [a] p< 0.005, Fat gtroup [b] p< 0.05; [c] p< 0.025.

In summary, we suggest that intestine and liver could undergo modifications in their microstructure due to changes on diet and then it could affect LAPO activity.

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DIETARY EFFECTS OF WHEAT BRAN AND RYE BRAN ON SERUM AND LIVER CHOLESTEROL LEVELS IN RATS

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The fibre consumption in humans is known to be hypolipidemic and is of particular interest in the prevention and treatment of cardiovascular diseases, but exists a great disagreement on quantitative and qualitative aspects of its utilization.

This work has been carried out with the aim of determining whether source of fibre (wheat bran and rye bran) and dosage (5% and 10%) can be related to modifications in the concentration of cholesterol in serum and liver.

Adult male healthy rats received a standard feed or the same feed containing (w/w) 5% wheat bran, 5% rye bran, 10% wheat bran or 10% rye bran, over a three-week period.

The tables show the mean values and standard deviation of the cholesterol in serum and liver:

	Cholesterol in the liver (mg/dl)	*Cholesterol in the serum (mg/dl)*
Control	10.92 ± 2.89	57.03 ± 6.41
Wheat 5%	11.54 ± 3.51 [a]	38.09 ± 5.57 [a, c, f]
Rye 5%	9.75 ± 2.97	54.24 ± 9.96
Control	10.92 ± 2.86	58.75 ± 9.42
Wheat 10%	8.17 ± 2.55 [b]	31.83 ± 7.57 [a, d]
Rye 10%	7.95 ± 2.08 [a]	55.84 ± 9.96

Significantly different from corresponding: Control group [a] p< 0.005, [b] p< 0.025; Rye 5% group [c] p< 0.005; Rye 10% [d] p< 0.005; Wheat 10% group [e] p< 0.01, p< 0.025.

No significant differences were observed in the amount of food intake.

In conclusion, serum and liver cholesterol levels were influenced to dosage and type of dietary fibre.

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HOMOCYSTEINE AS A RISK FACTOR FOR DEMENTIA - VASCULAR AND NON-VASCULAR MECHANISMS

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Introduction: Homocysteine is an amino acid totally absent from any dietary source; it is produced entirely from the methylation cycle. High homocysteine levels are a risk factor for cardiovascular diseases. There have been described several vascular mechanisms.

Hypothesis: Hyperhomocysteinemia and low vitamin B levels could be implicated in the pathophysiology of both vascular and non-vascular dementias.

Material and methods: Medline research about studies in demented people who have been measured plasma homocysteine and vitamin B6, B12 and folate levels. In order to support our hypothesis, we have followed the main criteria proposed by Hill (1965) and Rothman (1986) to distinguish causal from non-causal associations.

Results: From the data obtained in several studies, we can observe that a higher incidence of cerebrovascular diseases and Alzheimer's disease and a higher mortality ratio is associated with higher total homocysteine and lower vitamin B levels. The cause-effect relationship is confirmed by strength of association, consistency, biologic gradient and plausibility.

Only temporality needs to be confirmed in further research. In the vascular mechanisms, homocysteine mediates effects on endothelial cells and vascular functions. Non-vascular mechanisms of homocysteine could be a neurotoxic effect by activating the N-methyl-D-aspartate receptor, leading to cell death, or having an excitotoxic effect on neurons. Folate may play a role in maintaining the integrity of the brain late in life through non-vascular mechanisms.

Conclusions: High homocysteine and low folate, B12, B6 concentrations seem to be related to dementia. These correlations go beyond the known vascular mechanisms and thus pose further questions as to the mechanisms involved.

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ACCEPTABILITY OF PRESCRIBED NUTRITIONAL SUPPLEMENTS VERSUS COMMERCIALLY PRODUCED MILK DRINKS IN HOSPITALISED ELDERLY PEOPLE

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Commercially available milk drinks are good sources of protein and energy and may be a convenient and acceptable alternative to nutritionally complete supplements. This study compared sensory properties of similarly flavoured commercial drinks and nutritional supplements.

Subjects which were not acutely ill were recruited from the GAU and asked to rate on a 9-point scale their preference for randomly presented paired flavoured. In addition to appearance, texture, smell and flavour, subjects were asked to gauge how much of each product they could consume in a day.

Twenty subjects (7M:13F) with a mean age of 80.4 (SD7.4) yrs were recruited. The banana (median score = 6 v 3) and caramel (median score = 6 v 3) flavour median ratings were significantly higher in the commercial drinks than the supplements ($p < 0.05$), Wilcoxon signed rank). Appearance of strawberry flavour (2 v 2.5) was rated higher for the commercial product ($p < 0.01$).

Subjects stated they could consume significantly more of the commercial strawberry ($p < 0.05$) and banana ($p < 0.01$) product that the paired flavour nutritional supplement.

These results show many of the sensory properties of commercial products to be more acceptable than prescription nutritional supplements to elderly hospitalised individuals. Many subjects subjectively reported that the commercial drinks overall tasted «stronger». This may be a contributory factor in the apparent high acceptability of commercial products over nutritionally complete supplement drinks.

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MECHANICAL SOFT DIETS IN GERIATRIC NUTRITION

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The last century witnessed a great change in the age dstribution of the population of the developed countries. The world population is aging more and more, the life expectancy is increasing every year; consequently, people will live to be older and older.

Aging is a normal process characterized by a progressive loss of muscular tissue as well as by systemic changes of the body.

Due to the anatomic and functional changes, there is the need to adjust the nutrition to the digestive changes, in the mechanic, secretor and absortiv levels. Problems such as difficulty to masticate, to swallow and dysphasia are very important to the elderly.

The need to provide both a balanced diet that ensures the nutritional support of all the macro and micro-nutrients and an attractive appearance, adequate to the tastes and needs of the elderly has created the need to include in the hospital menus: the mechanical soft diets. These diets have replaced the traditional soft diets.

A comparative analysis of the two diets is presented in this poster. It focuses the nutritional, microbiologic and practical aspects of the diets to the hospital nutrition service.

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CALCIUM ABSORPTION FROM CALCIUM L-LACTATE AND OTHER CALCIUM SOURCES IN POST MENOPAUSAL WOMEN

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This study had two objetives. Firstly, the effect of the dietary background composition (no breakfast, western breakfast, Asian breakfast) on the bioavailability of calcium from Puracal, a soluble calcium L-Lactate, was investigated. True fractional calcium absorption, an important determinant of bioavalability was measured using the dual label isotope technique. Secondly, the absorption of calcium from calcium lactate was compared with calcium absorption from other calcium sources, being milk, carbonate citrate-matrate-malate and phosphate. All sources were given together with a western breakfast in a normal dosage containing about 200 mg of elemental calcium.

Ten menopausal women, aged 58 to 65 years participated in the study.

Results showed that true calcium absorption from calcium L-Lactate was not different when consumed with a western or Asian breakfast. True calcium absorption from calcium L-Lactate without a breakfast was 45%.

True calcium absorption from five different calcium sources (calcium L-lactate, milk, calcium carbonate, calcium citrate/malate and tri-calcium disphosphate) ranged from 24% for tricalcium di phosphate to 31,5% for calcium lactate. Only a statistically significant difference could be demonstrated between absorption of calcium, tri-calcium di-phosphate and from calcium L-Lactate.