equation. For men, a stepwise backward logistic regression including age, revealed a strong negative relationship between age and MMSE (odd ratio (OR) = 0.18; $p < 0.001$), and age and AWOH (OR = 0.32; $p < 0.01$). This last parameter was negatively linked to the BMI (OR = 0.36; $p < 0.05$) and positively to the BMC (OR = 4.77; $p < 0.01$). For women, the same kind of relationship was found between age and MMSE (OR = 0.21; $p < 0.001$), and age and AWOH (OR = 0.14; $p < 0.001$). BMI was positively related to MMSE (OR = 2.43; $p < 0.05$) and AWOH (OR = 2.94; $p < 0.05$). No link between the BMC and the functional or cognitive variables could be pointed out.

In conclusion, aging is the most powerful and the most constant parameter that explains the cognitive and functional impairments in free-living elderly people. An adequate level of fat-free mass contributes to the preservation of the physical capacities of men but not women. In both sexes, fat-free mass has no effect upon cognitive functioning. The physical and cognitive profiles are better in overweight women.

A family approach to risk factors for nutritionally linked diseases: the 'Fleurbaix Laventie Ville Santé' (FLVS). D Boute, JM Borys, MA Charle, F Thomas, C Toursel, E Eschwege, P Fossati *(Fleurbaix Laventie Ville Santé Association, 22, rue du 11-Novembre, 62840 Laventie; INSERM Unit 21, 94800 Villejuif, France)*

An epidemiological study aiming to locate the risk factors of nutritionally linked diseases over 3 generations is taking place in Fleurbaix and Laventie, 2 towns in the Pas-de-Calais area of France. The families are contacted through the list of children attending school. They complete a family tree enabling the different members to be identified. The clinical parameters recorded are weight, height, 4 skin folds, brachial circumference, waist circumference, hip circumference, blood pressure, pubertal development and vascular examination. The triglycerides, total cholesterol and glycemia levels are analysed by a capillary technique with the aid of Reflotron. A dietary survey is carried out (a record of the food consumed over 3 d for adults and a record for 1 d for children, in conjunction with a questionnaire of weekly frequency of consumption).

The participation rates in the survey were as follows: 95% consented to participate in the study; 85.2% to the completion of family trees; 83% to participation in the dietary survey. The first results concerned 362 boys aged 8.2 ± 1.8 years and 339 girls aged 8.1 ± 1.8 years. The waist to hip ratio (WHR) was significantly lower in girls than in boys $(0.83 \pm 0.05$ vs 0.86 ± 0.04, $p = 0.0001$). This difference was evident from the age of 5 years. The proportion of triglyceridemia exceeding 0.70 g/L (Relfotron's sensitivity threshold) was significantly higher in girls than in boys (56 vs 47%, $p = 0.02$). Glycemia, total cholesterol and blood pressure were not different. There was no correlation between the WHR and the blood pressure, glycemia and triglyceridemia levels. Glycemia was nevertheless significantly higher in children with triglycerides above 0.90 g/L (75th percentile) after adjustment for age or BMI (average adjusted 0.87 vs 0.91 g/L, $p = 0.02$). The preliminary data from the FLVS study revealed that the WHR in the prepubescent child does not have the same significance as in the adult. The relationship between glycemia and triglycerides could be the first to appear. The family context and the nutritional environment will allow a better understanding of the significance of this relationship.

Effects of a protein-restricted diet upon hepatic production of glucose in chronic renal failure. V Blanchetier, V Rigalleau, C Combe, M Aparicio, H Gin

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Resistance to insulin is often observed in patients with chronic renal failure (CRF). It very rarely leads to a disturbance in glucoregulation but participates in the cardiovascular morbidity observed during CRF. Impaired insulin action at the muscular level and reduced plasma insulin clearance have already been reported. These disorders are improved either by dialysis or low-protein diets.

In 6 CRF patients (plasma creatinine level 453 ± 41 μmol/L (m ± SD), 5 men and 1 woman (50 ± 11 years of age)), we studied the effect of a very low-protein diet (0.3 g/kg/d), supplemented with essential amino acids, keto derivatives and hydroxy analogs (Cetolog-Cernep France) and balanced in lipid content (30% of total caloric content) upon the endogenous glucose production (EGP) before and 3 months after dietary prescription. The EGP was studied using dideuterated glucose and the sensitivity of EGP to insulin by means of its change during a hyperinsulinic euglycemic clamp at a low level of hyperinsulinism (23.5 ± 2.8 μU/mL).

The basal EGP decreased from 2.62 ± 0.31 mg/kg/min to 2.30 ± 0.33 mg/kg/min after 3 months of protein restriction ($p < 0.05$) (paired test). During the euglycemic clamp, the EGP decreases from 1.45 ± 0.28 to 0.57 ± 0.21 mg/kg/min reflecting an improvement in the insulin sensitivity of the liver as the plasma insulin concentrations measured during the clamp were no different before and after the protein restriction.

These results show a moderately elevated basal EGP and a resistance to its reduction by insulin. These parameters are corrected by protein restriction, evidence of another favorable metabolic effect of a low-protein diet in CRF.

Antioxidants – lipid peroxidase and macroangiopathy in diabetic subjects.

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Our objectives were to determine the importance of lipid peroxidation in diabetic patients and, at the same time, their antioxidant vitamin status in order to assess whether they are associated with a risk of macroangiopathy.

The study included 129 diabetic subjects (type II) who were compared with 45 controls (same age and sex). The diagnosis of macrovascular complications was based on antecedents or clinical signs; an electrocardiography (ECG) after effort and arterial echodoppler of the lower limbs were systematically performed. The variable clinical factors were: body mass index (BMI); arterial hypertension (AHT); tabagism. The biological measurements consisted of blood lipid levels (serum vitamins (A, E, C) erythrocyte vitamin E determined by high-performance liquid chromatography (HPLC) methods), 2 direct markers of lipid peroxidation, serum thiobarbituric acid reactive substances (TBARS) determined according to Yagi (1976, *Biochem Med* 15, 212-216) and the oxidative resistance of the low density lipoproteins (LDL). The univariate statistic analysis used the Mann and Whitney test; the multivariate analysis used logistic regression.

The antioxidant vitamins concentrations were higher in the controls than in diabetic subjects. The results are given as mean values ± standard deviations control/diabetic subjects: serum vitamin C (mg/l) 6.98 ± 3.2 / 6.08 ± 4.42, $p < 0.05$; serum vitamin E (μmol) 32.7 ± 8.5 / 28.3 ± 9.01, $p < 0.01$;