GUIDE TO HYPERLIPIDEMIA DIAGNOSIS

**Causes of elevated total cholesterol and LDL-cholesterol**

- Hereditary hyperlipidemia (type IIa and IIb)
- A diet rich in saturated fats
- Liver disease
- Hypothyroidism
- Poorly controlled diabetes
- Excessive activity of the pituitary gland
- Kidney disease (nephrotic syndrome characterized by elevated cholesterol, protein loss in the urine, low protein levels in serum and swelling)
- Anorexia nervosa (malnutrition)
- Medication: progesterone, cyclosporine, thiazide diuretics.

**Causes of reduced HDL cholesterol**

- Malnutrition
- Obesity
- Smoking
- Medications: beta-blockers, anabolic steroids
- Reduced physical activity
- Polycystic ovary syndrome (a hormonal disorder with numerous ovarian cysts, irregular menstruation and the absence of menstrual periods, acne, obesity).

**Causes of increased triglyceride levels**

- Hereditary hyperlipidemia (Type I, IIb, III, IV or V)
- High calories intake, especially sugar and refined carbohydrates
- Obesity
- Poorly controlled diabetes
- Insulin resistance (reduced effect of insulin, the hormone that lowers blood glucose)
- Alcohol intake
- Stress
- Pregnancy
• Polycystic ovary syndrome
• Hepatitis
• Lupus
• Multiple myeloma
• Lymphomas
• Medication: estrogens as contraceptives or menopausal therapy, corticosteroids (cholestiromum, colestiol) and isotretinoin (used to treat acne).

**Risk factors for hyperlipidemia**

• Obesity
• A diet rich in saturated fats and trans-fatty acids
• Low intake of dietary fiber
• Physical inactivity
• Stress
• Smoking
• Life in industrialized countries
• Hypothyroidism
• Diabetes
• Polycystic ovary syndrome

**Basic laboratory analysis to detect hyperlipoproteinemia**

- Blood samples should be taken in the morning, after at least 12-14 hours of complete fasting
- It is desirable that in a period of 2-3 weeks before analysis, body weight does not change significantly and that the test person is on a usual diet (in terms of quantity and type of food)
- Examination should not be performed during other transient disorders (gastro intestinal disorders, flu, fever) and stress or any change in the rhythm of life.
- For the diagnosis of lipid disorders it is necessary to repeat the laboratory analysis at least once in the next 5-7 days. (This applies to the first review, and does not apply for check-ups with people already diagnosed).
- The upper limit of total cholesterol is 5.2 mmol / l and the borderline values range between 5.2 to 6.2 mmol / l. For people under 20 years of age, a desirable cholesterol level is up to 4.8 mmol / l.
The desirable LDL-cholesterol levels are 3.4 mmol/l, and values of 3.4 to 4.1 mmol/l are considered as borderline high.

The level of total cholesterol above 6.2 mmol/l and LDL-cholesterol levels above 4.10 mmol/l are considered high-risk.

For the patients with coronary heart disease, the preferred value for total cholesterol from 4.5-5.0 mmol/l and LDL-cholesterol up to 2.6 mmol/l.

THE ROLE OF DIET IN THE PREVENTION AND TREATMENT OF HYPERLIPIDEMIA

Diet or therapy by dietary modification is necessary in all forms of hyperlipidemia. In particular, hypertriglyceridemia is often treated only by the diet. Adequate, well balanced diet in case of increase in cholesterol levels can also lead to a significant reduction of its level.

Nutritionists and medical doctors refers to four dietary factors that have adverse effects on lipid and lipoprotein metabolism: increased total fat intake, increased intake of saturated fats, increased intake of cholesterol and too high energy (calorie) intake, leading to obesity.

The reduction of fats in the diet to 30% of daily energy intake can reduce the cholesterol levels by 0.50 mmol/l. The World Health Organization recommends that total fat intake should be limited to 30% of daily energy needs. Almost ⅓ of the required amount of fat should come from monounsaturated fatty acids and the rest of saturated and polyunsaturated fatty acids. Omitting only one egg per day from the diet decreases cholesterol for 0.2mm/l. It has been shown that moderately obese people on reduction diet decreased cholesterol levels for 0.80mm/l, if they achieved normal body weight.

The basic dietary plan for patients with hyperlipidemia includes limited total fat intake, reduced saturated and trans-fatty acids intake, and increased intake of unsaturated fatty acid with cis-configuration. The recommended dietary intake of fats is up to 30% of total energy intake, proteins about 15-20% and carbohydrates should be presented with 50-60% of total energy intake.