

APOLIPOPROTEIN E (APOE GENOTYPE)

PATHOGENESIS

Apolipoproteins have the characteristic of making lipids soluble in water, thus allowing their transport within the body. Their binding to specific cellular receptors is the first step in their cellular uptake. ApoE has the characteristic of binding specifically to LDL receptors and therefore regulates the catabolism of lipoproteins rich in triglycerides and cholesterol. ApoE is present in three isoforms (ApoE2, ApoE3 and ApoE4) with different biological characteristics. They are encoded by three alleles of a polymorphic gene present on chromosome 19 and are differentiated by two amino acids in position 112 and 158 (Arg / Cys). Polymorphisms produce six different genotypes defined as follows: ApoE 2/2, 2/3, 2/4, 3/3, 3/4 and 4/4. Compared with ApoE3, ApoE4 has a higher affinity, while ApoE2 has a much lower affinity for the LDL receptor. As a result, lipoproteins are eliminated from plasma much faster in carriers of the ApoE4 allele. This causes a "down-regulation" of the expression of liver LDL receptors, with a consequent increase in the plasma cholesterol rate. Therefore, ApoE4 is potentially atherogenic, while ApoE2 has a protective effect. In fact, several studies have shown an association between ApoE isoforms and cardiovascular risk. It was also found that the frequency of the ApoE4 allele gradually decreases in Europe from north to south and is almost absent in Asian countries. This finding has been correlated with the different prevalence of cardiovascular disease in different populations. A recent study has shown how at the brain level ApoE is involved in the repair of neuronal damage and how the efficiency of this repair is dependent on the different isoforms (ApoE3 is much more effective than ApoE4). The ApoE4 isoform has also been involved in the increased risk of Alzheimer's disease (2.2 to 4.4 times for heterozygotes and 5.1 to 17.9 times for homozygotes) and is apparently associated with a lowering of the age of appearance of the disease. However, it should be considered that although ApoE is the major susceptibility gene for Alzheimer's disease there are other risk factors such as exposure to toxins, head trauma, age and other susceptibility genes (APP, PS1, PS2 and BCHE).

EPIDEMIOLOGIA

The 3/3 genotype is the most frequent (60% of the general population) and is defined as "wild-type".

TEST

Evidence of mutations in position 112 and 158 by PCR and restriction analysis.

PRELIEVO

EDTA blood, 5 ml.

ESECUZIONE

Daily.
