48. THE ROLE OF GENES IN THE DEVELOPMENT OF OBESITY

Author: Andriuță Carolina

Scientific adviser: Ludmila Rotaru, Doctor of biology, Department of Molecular Biology and Human Genetics *Nicolae Testemitanu* State University of Medicine and Pharmacy of the Republic of Moldova.

Introduction. Obesity is one of the major challenges faced by modern society. It has been generally accepted that obesity is a multifactorial condition, with diet, physical activity, stress, sleep pattern and environment playing a great role in its development. However, with the completion of the Human Genome Project, as well as the emergence of Genome-Wide Association Studies, there has been more evidence of a genetic component being present among other risk factors. Moreover, an individual's genetic background may also influence their response to a certain diet, making it necessary for a personalized approach to be considered.

Aim of study. This review has the aim to highlight the genetic component of obesity, as well as the perspectives of implementing a personalized nutrition plan that would take into account a person's genetic makeup.

Methods and materials. Data from specialized articles that include various research in the given field has been analyzed.

Results. The inter-individual variability of BMI has been attributed to genes in a 40-70% proportion. SNPs account for 30% of variation in BMI. The most common genes that have been linked to the development of obesity are FTO, MC4R and APO-A gene family. FTO gene polymorphisms result in a higher energy intake, overeating and reduced satiety. Variations of the MC4R gene highly expressed in the hypothalamus, result in an altered appetite control, which leads to hyperphagia with a preference for foods rich in fat. APO-A5 SNPs have been strongly associated with a higher risk of obesity, which is based on changes in the lipid metabolism, particularly an increased triglyceride level. Polymorphisms in these genes have also shown different dietary responses. FTO and MC4R SNPs present a lower adherence to the Mediterranean diet, while APO-A5 polymorphisms benefit greatly from a low fat diet, with a more significant reduction in total cholesterol and LDL-c.

Conclusion. The genetic component of obesity has been vastly studied over the past years, however extensive research is still needed in this developing field. This knowledge can give us important insights into prevention and management of obesity, with the introduction of a personalized nutrition approach that would increase patient compliance to certain diets.