

Summary

Chronic lymphocytic leukemia is the most common leukemia in adults in Western countries with an average incidence rate of about 4/100,000 inhabitants/year and the median age at diagnosis is about 70 years. It is characterized by clonal proliferation of B lymphocytes with a specific immunophenotype: CD5, CD23, CD19, CD20 and their accumulation in peripheral blood, bone marrow and lymphoid tissues.

Its course is varied and not always predictable. Only 1/3 of patients require treatment at the time of diagnosis. The severity of the disease is determined by 2 scales: according to Rai and according to Binet. Many prognostic factors of clinical, cytometric, cytogenetic and molecular nature have been distinguished in order to establish a more precise prognosis in this disease. Indications for starting treatment are strictly defined. Observation of patients not requiring therapy is still recommended.

Metabolomics is a field of science that belongs to systems biology. It deals with the overall assessment of small-molecule metabolites in a given biological system. A variety of separation and identification methods are used in metabolomics.

In this study, the LC-MS/MS and FIA-MS/MS methods with the Biocrates AbsoluteIDG p180 kit were used for the quantitative analysis of selected 180 plasma metabolites in patients with chronic lymphocytic leukemia (CLL), both untreated (CLL_N) and those requiring treatment (CLL_T) compared to healthy people as well as among themselves.

The conducted analyzes confirmed disturbed metabolic pathways, in particular the metabolism of amino acids and lipids, what is consistent with earlier reports that glutamine and fatty acids are the main source of energy for CLL cells.

In the comparison between the CLL_N and CLL_T groups, after statistical analysis, 3 compounds were found that differentiated these 2 groups: 2 dimethylated arginine derivatives: ADMA and SDMA, and lysophosphatidylcholine C18:2 (the latter compound showed a decrease in concentration in the CLL_T group). In combination with 2 clinical factors: Rai stage and lymphocyte count, a 5-factor quantifier was created with an AUC of 0.983 for the ROC curve.

The results of this analysis require confirmation in a study with a larger group of patients.