

EVALUATION OF XANTHINE OXIDASE ACTIVITY AND QUANTIFICATION OF ITS METABOLITES IN THE SERUM OF B-ALL PATIENTS

Priscila Bordoni Volpato; Pedro Henrique Doleski; Renan da Silva Ebone; Thayanara Cruz da Silva; Rafaella Pereira da Silveira; Júlia Maria Sander Ganezini; Daniela Bitencourt Rosa Leal.

Federal University of Santa Maria, Santa Maria, Rio Grande do Sul, Brazil

INTRODUCTION: Acute Lymphoblastic Leukemia (B-ALL) is a neoplasm characterized by the abnormal presence of immature B-type lymphoid precursors in the bloodstream. Patients with B-ALL exhibit immunological dysfunctions, which may be related to the deficient production of reactive oxygen species (ROS), as these are essential for the proper function of leukocytes that perform phagocytosis and microbial destruction. Xanthine oxidase (XO) is an enzyme involved in purine metabolism, converting hypoxanthine to xanthine and subsequently xanthine to uric acid, with ROS generation. In this context, its activity may be linked to the dysfunction of the immune response in patients with B-ALL. **OBJECTIVE:** This study aimed to analyze the enzymatic activity of XO and to quantify serum levels of its substrates and products in B-ALL patients, in order to understand potential alterations in purine metabolism and ROS production. **MATERIALS AND METHODS:** Peripheral blood was collected from healthy individuals (n=10) and newly diagnosed B-ALL patients (n=10) from HUSM-SM (Ethics Committee: 16689613.0.0000.5346). XO activity in serum was measured using a spectrophotometric technique, while the quantification of hypoxanthine, xanthine, and uric acid levels in the serum was performed by HPLC. **RESULTS AND CONCLUSION:** A reduction in XO activity was observed in B-ALL patients, leading to increased serum xanthine levels. The reduction in hypoxanthine levels may be related to alterations in the activity of purine nucleoside phosphorylase, the enzyme responsible for its production. Numerous pathophysiological processes may be related to the modulation of purine metabolism observed in B-ALL patients. Considering that XO is a key enzyme in the production of ROS in blood cells, this reduction may be associated with a weakened immune response in B-ALL patients against pathogens. Thus, the findings reported here pave the way for further studies aiming to evaluate purine metabolism and oxidative stress in immune cells of B-ALL patients.

Keywords: leukemia; ROS; purines; immune response.