Evaluation of ADA activity and ROS production in patients with post thyroidectomy hypothyroidism.

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Thyroidectomy is the most common treatment for thyroid cancer, but it can cause a state of hypothyroidism, which leads to manifestations in several systems. The reactive oxygen species (ROS) production may be increased in patients with this pathology and may occur changes in blood coagulation, generating a thrombotic condition. Intercellular signaling mediated by purine nucleotides and nucleosides constitutes an important target of study due to its role in modulation of biological processes including inflammation and thrombus formation. Adenosine deaminase (ADA) is an enzyme expressed on platelets surface, which is responsible for deamination of adenosine. So, this study aims elucidate possible alterations on ADA activity in platelets, and their relationship with ROS production and oxidative stress in patients with post thyroidectomy hypothyroidism. The sample was composed of 45 patients with post-thyroidectomy hypothyroidism and 45 healthy subjects as control group (Protocol under number 02121712.2.0000.5346). ADA assay was determined according to Guisti; Galanti, 1984. Adenosine levels were performed by HPLC. ROS levels were determined according to Ali et al., 1992. Data were statistically analyzed using t-test. Differences were considered significant when P<0.05. The adenosine levels in serum were lower in patients with hypothyroidism (22.47±5.42) when compared with controls (40.92±5.37). On the other hand, ADA activity was higher in patients (3.60±0.26) in comparison with controls (2.35±0.11). Moreover, ROS production was increased (0.29±0.01) in patients when compared with healthy subjects (0.19±0.007). The high ROS production and consequent oxidative stress in patients with hypothyroidism can be contributing to increase the inflammatory process and ADA activity. This increase causes a rapid adenosine deamination that may generate a decrease of this nucleoside in the systemic circulation. In fact, we found a decrease in adenosine levels in serum, which can be associated with the development of vascular complications, since this nucleoside plays an important role in the prevention of thrombotic processes.

Key words: Hypothyroidism, Adenosine desaminase, Reactive oxygen species