ECTO-NUCLEOTIDASES AS POTENTIAL BIOMARKERS FOR DIAGNOSIS OF ENDOMETRIOSIS

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Introduction: Endometriosis is an inflammatory disorder characterized by the growth of endometrial tissue in extrauterine locations. Ovarian endometriomas are a common form of endometriosis. Late diagnosis is the main problem in this pathology; thus, it is important to identify clinical biomarkers. Ecto-nucleotidases are enzymes that hydrolyze extracellular ATP to adenosine and are involved in many inflammatory processes. Alterations of ecto-nucleotidase activity are related to inflammatory disease states.

The aims of the present project were: I) to characterize the expression and activity of ecto-nucleotidases in ovarian endometriomas, and II) to evaluate the utility of ecto-nucleotidases expression in the contents of endometriomas as a possible biomarker of endometriosis.

Material and Methods: To achieve our objectives, ovarian endometrioma tissue were analysed through immunolabeling and nucleotidase activity assays (objective I).

Echo-guided aspirated fluids of ovarian endometriomas and simple ovarian cysts were studied with ELISA technique (objective II). A case-control comparative study was conducted with two groups: a) fluid content of endometriomas from women with endometriosis and b) fluid content of simple cysts from women without endometriosis. The expression of adenosine deaminase (ADA), alkaline phosphatase (ALP), and ecto-nucleotide pyrophosphatase/phosphodiesterases 1 and 3 (ENPP1 and ENPP3) was determined in fluid of ovarian endometriomas and simple cysts.

Results: We showed that ecto-nucleotidases are present in ovarian endometrioma tissue. There was a differential distribution of ecto-nucleotidases among epithelia and stromal cells of ovarian endometriotic lesions. The case-control comparative study showed a significant difference in ADA and ENPP1 levels among endometriomas aspirates in comparison to simple cysts ($p<0.001$). Comparisons of ALP and ENPP3 levels among endometriomas and simple cysts did not turn up significant differences ($p>0.05$).

Conclusions: Ecto-nucleotidases are abundantly present in ovarian endometriotic cells, and alterations of their activity may be related with endometriosis development. Furthermore, ADA and ENPP1 are biomarker candidates of endometriosis. Our results emphasize the relevance of studying purinergic signaling in endometriosis in order to add to the knowledge of physiopathological mechanisms underlying this pathology.

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