عنوان مقاله:

1H NMR- based metabolomics approaches as non- invasive tools for diagnosis of endometriosis

محل انتشار:

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خلاصه مقاله:

Background: So far, non-invasive diagnostic approaches such as ultrasound, magnetic resonance imaging, or blood tests do not have sufficient diagnostic power for endometriosis disease. Lack of a non-invasive diagnostic test contributes to the long delay between onset of symptoms and diagnosis of endometriosis. Objective: The present study focuses on the identification of predictive biomarkers in serum by pattern recognition techniques and uses partial least square discriminant analysis, multi-layer feed forward artificial neural networks (ANNs) and quadratic discriminant analysis (QDA) modeling tools for the early diagnosis of endometriosis in a minimally invasive manner by 1H- NMR based metabolomics. Materials and Methods: This prospective cohort study was done in Pasteur Institute, Iran in June 2013. Serum samples of 31 infertile women with endometriosis (stage II and III) who confirmed by diagnostic laparoscopy and 15 normal women were collected and analyzed by nuclear magnetic resonance spectroscopy. The model was built by using partial least square discriminant analysis, QDA, and ANNs to determine classifier metabolites for early prediction risk of disease. Results: The levels of 2- methoxyestron, 2-methoxy estradiol, dehydroepiandrostion androstendione, aldosterone, and deoxy corticosterone were enhanced significantly in infertile group. While cholesterol and primary bile acids levels were decreased. QDA model showed significant difference between two study groups. Positive and negative predict value levels obtained about 71% and 78%, respectively. ANNs provided also criteria for detection of endometriosis.Conclusion: The QDA and ANNs modeling can be used as computational tools in noninvasive diagnose of endometriosis. However, the model designed by QDA methods is more efficient compared to ANNs in diagnosis of endometriosis patients.

کلمات کلیدی:

Metabolomics, Endometriosis, Nuclear magnetic resonance