

Biomarkers for possible diagnosis of the small intestine mucous membrane atrophy

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Abstract

Background: Methods for assessing small intestine mucous membrane atrophy (SIMA) by biomarkers are described. In a number of publications has been shown the possibility citrulline concentration in the blood using as a biomarker of SIMA.

Aim: To increase the accuracy for recognition SIMA by the citrulline concentration in blood as the biomarker of enterocytes mass and additionally use a biomarker of intestinal mucosa mucins mass.

Material and Methods: This study consists of several parts.

Stage1: Citrulline, threonine and other amino acids concentration was detected in the blood of healthy individuals (47 people) and in patients with proven atrophy (20 patients - pts, Marsh IIIA and more).

Stage 2: Check the proposed method by masking (30 pts): the specialist evaluating SIMA by the results of citrulline and threonine did not have information about the absence /presence SIMA by histology. Only after the conclusion about the state of the mucous membrane by biomarkers, all pts were examined by endoscopic with a biopsy and histological (specialists did not have information about the absence /presence SIMA by biomarkers).

Step 3: Evaluation of the proposed method based on ROC analysis.

Stage 4: Checking the occurrence of false results. In a randomized group of patients (100 pts) with intestinal diseases, the state of the small intestinal mucosa was assessed using biomarkers, and with a positive result, atrophy and high-resolution endoscopy with biopsy and histology were clarified. Data analysis and comparison was carried out using statistical processing software Statistica-6, version 6.1, series 1203d and Winpepi. Different models were used to calculate the citrulline (CI) and threonine (TI) index using the model formulas.

Results: Positive values of CI (more than 0,1) the presence of SIMA should be determined, at lower values of CI - no change in enterocytes' mass can be stated; for positive values of TI (>0,1) - reducing of the mass of mucosal mucines can be determined, at lower values of TI - no change in mass of mucins can be proven. SIMA detected with specificity – 0,89 (95% CI 0,57–0,98) and sensitivity 0,82 (95% CI 0,52–0,95). ROC analysis shown: the area under the characteristic curve (AUC) for SIMA detected was 0,97 (95% CI = 0,87–0,99). The false-positive rate was 6.7% (95% CI = 3–28%). When CI value is more than 0,1 and TI value is more than 0,1, the state of small intestinal mucosa can be evaluated as “definitely SIMA”; when CI more than 0,1, combined with TI less than 0,1

Conclusion: The presented results prove the possibility of using the proposed method for assessing the state of the mucous membrane of the small intestine by biomarkers as the citrulline (CI) and threonine (TI) index.



Biography:

Marakhouski Y approved as Professor of Clinical Medicine in 2005 year by the Higher Certification Commission of the Council of Ministers of the Republic of Belarus. He has published more than 30 papers in reputed journals and serving as a member of the editorial board of several reputed journals (predominantly in Russia and Belarus). He is principal investigator on numerous clinical (18) and preclinical (6) studies and has been involved in the study of many medication including mesalazine, amino acids, anti-TNF.

Speaker Publications:

1. “Biomarkers for possible diagnosis of the small intestine mucous membrane atrophy”.

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