Fatty Acid Profile of Erythrocyte Membranes for Characterization of Patients with Intestinal Polyps and Uterine Leiomyoma: Towards Biomarker Discovery

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The study presents fatty acid composition of erythrocyte membranes of two groups of patients. Both groups, either with uterine leiomyoma or intestinal polyps, were found to be distinguishable in a previous study [1]. Additional, data were gathered for further investigation to find and examine abnormalities in the membrane profiles to test whether these changes might be relevant to both diseases. Blood samples were taken from 139 donors irrelevant to their diet and the consumption of specific fatty acids. From these donors 53 had uterine leiomyoma, 16 intestinal polyps, and 70 served as a healthy control group. After the isolation of erythrocytes from blood samples, total extracted lipids were separated by solid-phase extraction (SPE) into non polar lipids and polar phospholipids. An improved analytical method for lipid extraction was applied. Successive addition of extraction solvents was performed to achieve better lipid recovery and to enhance method sensitivity. The study confirmed the suggestions that intestinal polyps formation is closely related to the higher levels of palmitic (16:0), stearic (18:0) and oleic (18:1n9) acids. At the same time the concentrations of n-3 PUFAs (DPA and DHA) were significantly lower, as well as some of n-6 PUFAs (20:3n6, AA (20:4n6), 22:4n6, 22:5n6 and linoleic acid (18:2n6)). A small subgroup of patients with uterine leiomyoma was anomalous according to their high linoleic (18:2n6) acid content and might imply a stage of the disease due to the corrupted metabolic pathway. Data exploration of analytical results pointed out possibility for the classification of patients according to some specific fatty acids relevant to the disease state that could be potentially useful for diagnostic purposes and could be further tested for the selection of biomarkers.

[1] Z.C. Kodba, D.B. Vončina, M. Novič and U. Potočnik, Acta Chim. Slov. 57 (2010), pp. 571-580.