Generation of urinary steroid profiles in patients with adrenal tumors using gas chromatography–mass spectrometry

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We developed the technique of the urinary steroid profiles (USP) generation by gas chromatography–mass spectrometry (GC-MS) and optimized sample preparation procedure and conditions of chromatographic analysis. The enzyme for hydrolysis (64 h, t 37°C) was sulfatase from Helix pomatia. Steroids were extracted with chloroform. The efficacy of derivation was increased by enlargement of methoxyamine solution volume in pyridine to 160μL and TSIM to 500μL for 5ml of urine. 5α-androstanediol was an internal standard for quantitative calculations. 66 steroids by a GC–MS QP2010 ULTRA gas chromatograph–mass spectrometer (Shimadzu, Japan) were determined. 4 types of USP for 32 patients with adrenocortical carcinoma (ACC) are revealed by GC-MS. The difference between them was androgen and glucocorticoid secretion. 15 main ACC features were observed by GC-MS. 100% sensitivity and specificity of ACC and adrenocortical adenoma (ACA) differential diagnosis were achieved by combination of following parameters: THS> 900 µg/24 h and/or DHEA> 1500 µg/24 h with ratios of 3α,16,20-pregnentriol/ 3β,16,20-pregnentriol (3α,16,20dP3 /3β,16,20dP3) less than 6.0 and 3α,17,20dP3 /3β,17,20dP3 less than 9.0 and the detection of non-classical 5-en-pregnens, not found in ACA and healthy persons. Features of 21-hydroxylase and 11β-hydroxylase deficiency were found in 32.2% and in 61.3% patients with ACC respectively. The decrease of activity of 21-hydroxylase in patients with ACA was also found. Probably, it is found one of the pathogenetic mechanisms in the formation of adrenal cortex tumor and malignance.

Biography
Ludmila I Velikanova has completed his PhD and Post-doctoral studies from NWSMU n.a. I I Meechnikov Saint-Petersburg, Russia. She is the Director of research laboratory of chromatography at NWSMU n.a. I I Meechnikov Saint-Petersburg. She has published more than 30 papers in reputed journals and is a researcher interested in the use of chromatography in endocrinology.

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