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Genetic Association between the *CYBA 640A>G* Polymorphism and the Risk of Uterine Myoma

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Background & Hypothesis:
Reactive oxygen species (ROS) have been proposed to play a significant role in the aetiology of uterine myoma. Increased production of reactive oxygen species, especially superoxide anion, significantly may contribute to the oxidative stress associated with myoma. The aim of this study was to investigate the association between functional polymorphism *640A>G (rs1049255)* of the CYBA (cytochrome b-245, alpha polypeptide of NADPH oxidase) gene and the risk of uterine myoma.

Methods:
The study sample included 488 unrelated patients from Central Russia (287 patients with uterine myoma and 201 healthy women). Genotyping of the polymorphism was performed by TaqMan assay.

Results:
The CYBA genotype frequencies were in agreement with Hardy-Weinberg equilibrium in the case and control groups (P >0.05). The frequency of the *640A* allele was higher in patients with uterine myoma (0,542) comparison to control (0,463): OR = 1.37, 95% CI 1.06-1.77, P = 0.01. We found that the *640GG* genotype was associated with the lower risk of uterine myoma (OR = 0.65, 95% CI 0.43-0.98, P = 0.04).

Discussion & Conclusion:
NADPH oxidases play a major role in the production of superoxide anion radicals. The functional *640A>G* variant might modify mRNA processing and stability. Enhanced ROS production in the carriers of the *640A* allele may result in increased angiogenesis, production of the extracellular matrix, cytokines and growth factors, thus promoting the development of uterine myoma.