

## Polymorphic variants of folate and choline metabolism genes and the risk of endometriosis-associated infertility.

[Szczepańska M](#)<sup>1</sup>, [Mostowska A](#), [Wirstlein P](#), [Lianeri M](#), [Marianowski P](#), [Skrzypczak J](#), [Jagodziński PP](#).

### Abstract

#### OBJECTIVE:

Endometriosis has been considered an epigenetic disease. Single nucleotide polymorphisms (SNPs) located in genes encoding enzymes of the folate and choline metabolism may affect DNA methyltransferase activity.

#### STUDY DESIGN:

We studied 16 SNPs in 12 folate and choline metabolism genes, including BHMT (rs7356530 and rs3733890), BHMT2 (rs625879), CBS (844ins68), CHDH (rs893363 and rs2289205), CHKA (rs7928739), MTHFD1 (rs2236225), MTHFR (rs1801133), MTR (rs1805087), MTRR (rs1801394), PCYT1A (rs712012 and rs7639752), PEMT (rs4244593 and rs4646406) and TCN (rs1801198) in one hundred and sixty-three infertile women with minimal endometriosis and one hundred and fifty fertile women.

#### RESULTS:

There were no significant differences between genotype and allele frequencies of these gene variants in infertile women with endometriosis (n=163) and controls (n=150). The lowest, but not statistically significant, p values of the trend test were observed for the CBS 844ins68 and MTR rs1805087 (ptrend=0.0527 and ptrend=0.0771, respectively) polymorphisms. However, the exhaustive multifactor dimensionality reduction analysis revealed an epistatic interaction between rs1801133 of MTHFR and rs4244593 of PEMT in endometriosis-associated infertility (p=0.0240).

#### CONCLUSIONS:

Our results showed moderate evidence for the contribution of SNPs located in genes encoding folate and choline metabolism enzymes to infertility in women with endometriosis.