

Zohreh Hekmati Azar Mehrabani ¹, Nadereh Rashtchizadeh ², Maryam-Hamzeh-Mivehroud³,
Manizheh Sayyah Melli⁴,

1 Department of clinical biochemistry and laboratory medicine, Tabriz University of Medical Sciences, Tabriz, Iran.

2 Drug Applied Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

3 Biotechnology Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

4 Department of Obstetrics and Gynecology, Alzahra Teaching Hospital, Tabriz University of Medical Sciences, Tabriz, Iran.

Abstract

Introduction: There are many ideas concerning the etiology and pathogenesis of preeclampsia including endothelial dysfunction, inflammation and angiogenesis. Elevated levels of total homocysteine (Hcy) and lipoprotein (a) [Lp(a)] are risk factors for endothelial dysfunction. This study aimed to evaluate the effect of high dose folic acid (FA) on serum Hcy and Lp(a) concentrations with respect to methylenetetrahydrofolate reductase (MTHFR) polymorphisms 677C→T during pregnancy.

Methods: In a prospective uncontrolled intervention, 90 pregnant women received 5 mg FA supplementation before pregnancy till 36th week of pregnancy. The MTHFR polymorphisms 677C→T, serum lactate dehydrogenase activity, urine protein and creatinine concentrations were measured before starting FA administration. Serum levels of Hcy and Lp(a) were determined before and after completion of folic acid supplementation period.

Results:Supplementation of the patients with FA for 36th week significantly decreased levels of serum Hcy from 11.70 (4.40-28.70) to 9.80 (1.60-20.80) $\mu\text{mol/L}$ ($p=0.001$). Nevertheless, there was no significant change in serum Lp(a) after FA supplementation ($p=0.43$). The overall prevalence of genotypes in pregnant women under studying for MTHFR677T polymorphism was 53.3% CC, 26.7% CT and 20.0% TT. However, the results indicate that there was no

significant correlation between decreasing level of serum Hcy levels in the patients receiving FA and MTHFR polymorphisms.

Conclusion: FA supplementation effects on decreasing of Hcy serum levels have been considered as an independence factor from genotype. Moreover, as a first time, the results of present study reveal that FA supplementation is ineffective factor in declining of serum Lp(a) and emphasize that results was not affected by MTHFR genotypes.

Keywords:Folic Acid; Homocysteine; Lipoprotein (a); pregnancy; MTHFR polymorphism