

Homocysteine Methylenetetrahydrofolate Reductase

The Analysis of Interrelationship between Homocysteine and Methylenetetrahydrofolate Reductase Mutation in Patients with Recurrent Spontaneous Abortion

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Objective: To analyze the interrelationship between homocysteine and methylenetetrahydrofolate reductase (MTHFR) mutation in patients with recurrent spontaneous abortion.

Material and Method: Homocysteine and MTHFR mutation were tested by fluorescent polarizing immunoassay and PCR-RFLP method, respectively.

Results: In patients with homocysteine level less than 5 μ mol/L, there was no case of normal group but there were four cases of heterozygosity and one case of homozygosity. In patients with homocysteine level 5~10 μ mol/L, the number of normal, heterozygosity and homozygosity group were eleven, eighteen and eight, respectively. In patients with homocysteine level 10~15 μ mol/L, the number of normal, heterozygosity and homozygosity group were four, one and one, respectively. In patients with homocysteine level more than 15 μ mol/L, there was no case of normal and heterozygosity group but there were two cases of homozygosity.

Conclusions: Hyperhomocysteinemia due to MTHFR mutation is a cause of recurrent spontaneous abortion. And there was a significant relationship between homocysteine and MTHFR mutation.

Key Words: Recurrent spontaneous abortion, Homocysteine, MTHFR mutation

Homocysteine
20
homocysteine
(thromboembolism)
homocysteine
가
Homocysteine
methionine
sulfhydryl
가
homocysteine-homocysteine

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homocysteine-cysteine disulfide homocysteine homocysteine MTHFR

ine homocysteine steine

cysteine methionine 가 Homocysteine

(remethylation)가 cysteine

가 (trans-sulfuration)

Methionine synthase 1.

cobalamin (cofactor) 1999 3 2001 2

Methyl 5-methyltetrahydrofolate 50

rofolate 가 5-methyltetrahydrofolate

5,10-methylenetetrahydrofolate가 Methylenetetrahydrofolate reductase (MTHFR) (reduction)

MTHFR (thermolabile variant) (nucleotide) 677 cytosine

thymine alanine valine EDTA 가

1,000 g 15

-70 가 가

12

betaine methyl donor betaine-homocysteine methyltransferase Homocysteine FPIA

(fluorescent polarizing immunoassay) IMx

(Abbott, USA)

synthase (CBS) cystathionine ?-cystathionine

2) MTHFR

B₆ pyridoxal-5-phosphate가 B₆ cystathionine

DNA DNA (extraction column, QIAmp blood kit, Qiagen)

9ine cysteine alpha-ketobutyric acid

DNA (primer set)

Homocysteine sense primer (5'-TGAAGGAGAAGGTGTCTGCGGGA-3')

cobalamin B₆ 가 antisense primer (5'-AGGACGGTGCGG-TGAGAGTC-3')

가 GeneAmp PCR machine (Perkin Elmer 2400) 198 bp

homocysteine 가 95 60

B₆ methionine 61 60

homocysteine 72 120

가 35

가 B₆가 677 C T

가 37 3~4

homocysteine A (Ala) (allele)

0.5 mg cobalamin 198 bp *Hinf*I

lamin (neuropathy) V (Val)

B₆ B₁₂ 가 175 bp 23 bp

MTHFR homocysteine *Hinf*I 2.5% agarose gel

ethidium bromide

Table 1. MTHFR gene mutation according to different homocysteine levels in patients with recurrent spontaneous abortion

Homocysteine	CC	CT	TT	Total
5 ? mol / L		4	1	5
5~10 ? mol / L	11	18	8	37
10~15 ? mol / L	4	1	1	6
15 ? mol / L			2	2

Table 2. The analysis of interrelationship between homocysteine and MTHFR reductase mutation in patients with recurrent spontaneous abortion by Cochran-Mantel-Maenszel statistics

Statistic	Alternative Hypothesis	DF	Value	Prob
1	Nonzero Correlation	1	0.0089	0.9249
2	Row Mean Scores Differ	2	6.0689	0.0481
3	General Association	6	12.9491	0.0439

3.

homocysteine MTHFR
Cochran-Mantel-Maenszel

Homocysteine 가 5 ? mol/L
(heterozygosity)가

4 , (homozygosity)가 1 . Homocysteine 가 5~10 ? mol/L ,

가 11 , 18 , 8 .

Homocysteine 가 10~15 ? mol/L , 가 4 , 1 , 1

. Homocysteine 가 15 ? mol/L 가

가 2 (Table 1).

p value = 0.048 homocysteine MTHFR 가

(Table 2).

homocysteine homocysteine
5~15 ? mol/L ! , ,

homocysteine 16~30 ? mol/L, 31~100 ? mol/L, 100 ? mol/L . ,

가 40%

homocysteine 가 .

Homocysteine

methionine (demethylation)
sulfur

0.9 g

2.0 g

23

Homocysteine

가 methionine S-adenosylmethionine
homocysteine

(trans-sulfuration) (remethylation)

. Methionine B₆

cystathionine ?-synthase (CBS)가

가

CBS가 homocysteine

4,5

B₁₂가

(cofactor) homocysteine methi-

onine . homocysteine methionine

6

homocysteine

homocysteine

가 homocysteine

homocysteine 가

가

homocysteine

homocysteine

homocysteine

homocysteine

homocysteine

homocysteine

homocysteine disulfide

peptide bond

가

homocysteine

homocysteine

homocysteine

homocysteine

Homocysteine

homocysteine

7~10

B₆ B₁₂

homocysteine

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