The presence of polymorphic variant A1298C of the MTHFR (methylenetetrahydrofolate reductase) gene is associated with lower body mass index in girls with anorexia nervosa

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Introduction

Single nucleotide polymorphic variants of the methylenetetrahydrofolate reductase (MTHFR) gene have been related with a tendency to gain weight according to recent studies. The aetiology of atypical anorexia nervosa remains under investigation and might be associated with the genetic background.

Objectives

The aim of this study was to evaluate the association between the presence of A1298C or C677T polymorphisms of the MTHFR gene and weight status in a sample of adolescent girls diagnosed with anorexia nervosa.

Materials & Methods

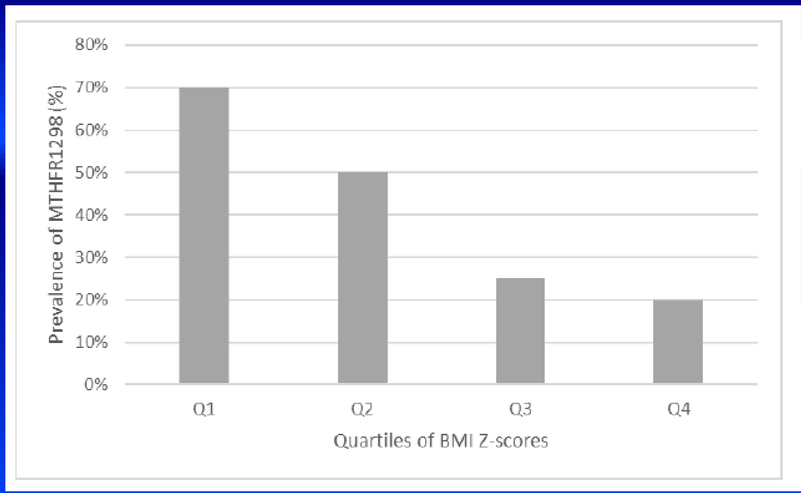
This cross-sectional study evaluated a total of 40 adolescent girls diagnosed with anorexia nervosa aged 13-19 years. We recorded anthropometric parameters and calculated body mass index (BMI) z-scores adjusted for age, as well as duration of amenorrhea. Blood samples were obtained for genotyping and hormonal assessment.

Demographic/anthropometric		Mean±SD or Frequency (%)	IQR
Age (years)		15.3±1.6	14 – 17
BMI (kg/m^2)		16.3±1.4	15.4 – 17.4
BMI z-score		7.71±9.3	0.38 – 12.68
Prevalence of amenorrhoea		80%	
Genotype frequencies			
MTHFR A1298C	AA (wt)	57.5% (23/40)	
	AC	32.5% (13/40)	
	CC	10% (4/40)	
MTHFR C677T	CC (wt)	67.5% (27/40)	
	CT	25% (10/40)	
	TT	7.5% (3/40)	

SD=standard deviation; IQR=interquartile range; BMI=body mass index

Results

- Mean values of BMI were 16.25±1.41kg/m2, while the mean BMI adjusted for age was -2.10±1.31.
- The prevalence of the MTHFR A1298C polymorphic variant differed, almost significantly, between quartiles of BMI z-scores (CA+CC vs AA genotype, Q1 vs Q2 vs Q3 vs Q4: 70% vs 50% vs 25% vs 20%, chi-square p=0.092).
- Multivariate regression analysis showed that girls with BMI z-scores within the top quartile had significantly lower risk of carrying the MTHFR A1298C polymorphic variant compared to the lowest quartile (CA+CC genotype vs AA genotype: OR 0.047, p=0.032), adjusted for age, estrogen levels and duration of amenorrhea.
- The prevalence of MTHFR C677T polymorphic variant or the combined prevalence of either MTHFR polymorphic variant (C677T or A1298C) did not differ between quartiles of BMI z-score adjusted for age.



Conclusions

✓The presence of the polymorphic allele A1298C of the MTHFR gene is associated with lower BMI in adolescent girls with anorexia nervosa.

✓There was no such association for the polymorphic variant C677T of the MTHFR gene.