

# Influence of The -202 A/C IGFBP-3 Promoter Polymorphism on Individual Variation in Body Height in Korean Girls

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## Background

The most common single nucleotide polymorphism in the IGFBP3 promoter region occurs at position -202. This polymorphic variation occurs frequently and may influence growth hormone responsiveness and somatic growth.

## Objective and hypotheses

This study aimed to assess the effects of IGFBP3 promoter polymorphism on growth in children.

## Method

Restriction fragment length polymorphism (RFLP)-based genotyping of the -202 single nucleotide polymorphism was performed in 146 Korean girls aged between 15 and 16 years, who were selected randomly from the Seoul School Health Promotion Center. The participants were divided into three groups (tall, medium, and short) according to the height percentile established from normal reference values for Korean children. The serum levels of IGF-I and IGFBP-3 were then compared according to genotype.

## Results

The genotype distribution in the participants was 79 AA (54.1%), 60 AC (41.1%), and 7 CC (4.8%). The C allele frequency at the -202 IGFBP3 position was 25.4% in this group. The mean serum IGFBP-3 concentration in girls with the AA genotype was higher than that in girls with the AC genotype in the medium ( $P = 0.047$ ) and short ( $P = 0.035$ ) groups, respectively. There was no difference in the IGF-I to IGFBP-3 molar ratio between the AA and AC genotype groups ( $P = 0.161$ ).

Fig. 1. Mean IGFBP-3 levels in all subjects according to genotype at nucleotide -202.

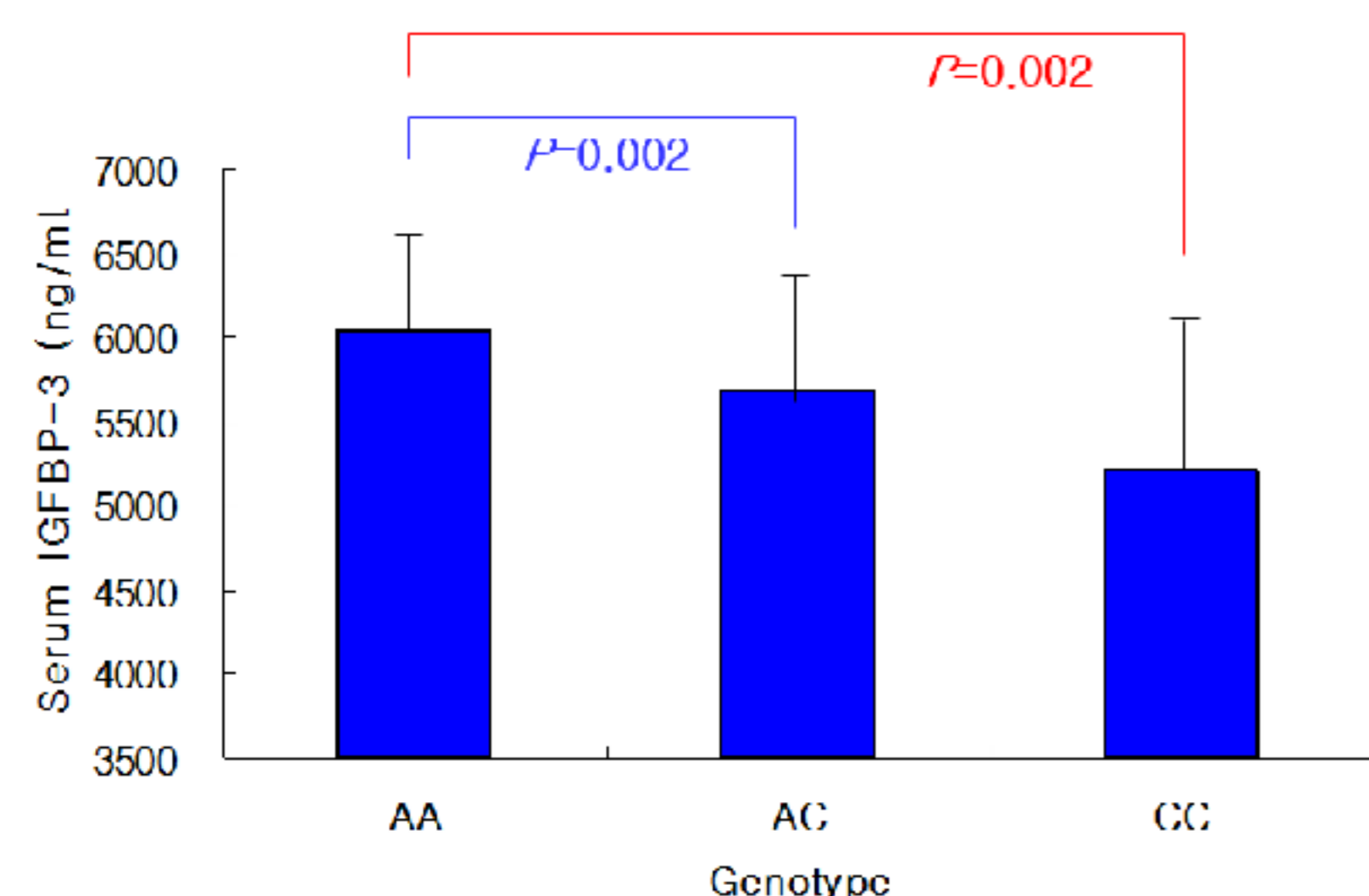


Fig. 2. IGF-I/IGFBP-3 ratio in all subjects according to genotype at nucleotide -202.

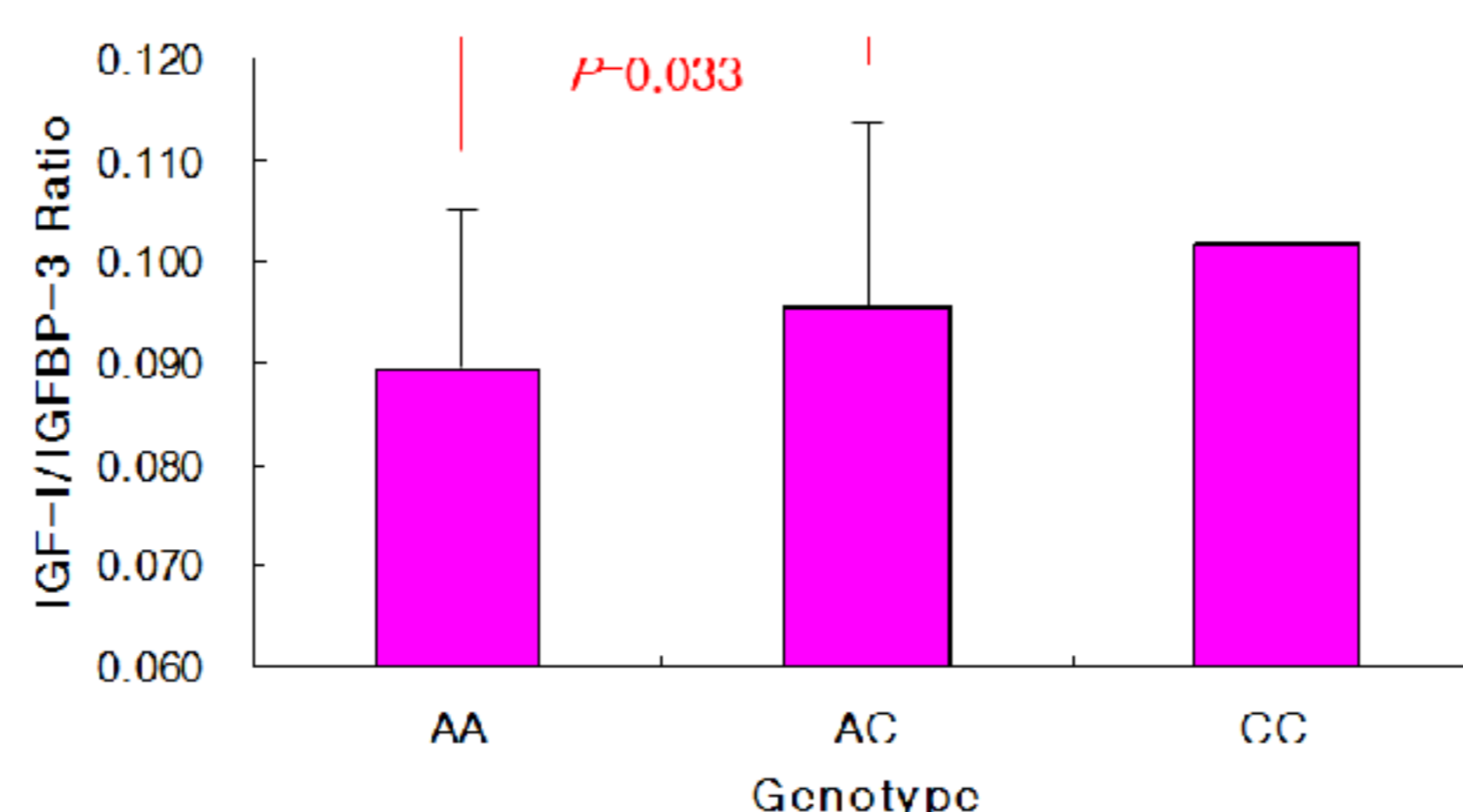


Fig. 3. Mean level of IGF-I, IGFBP-3 and IGF-I/IGFBP-3 ratio were compared according to group.

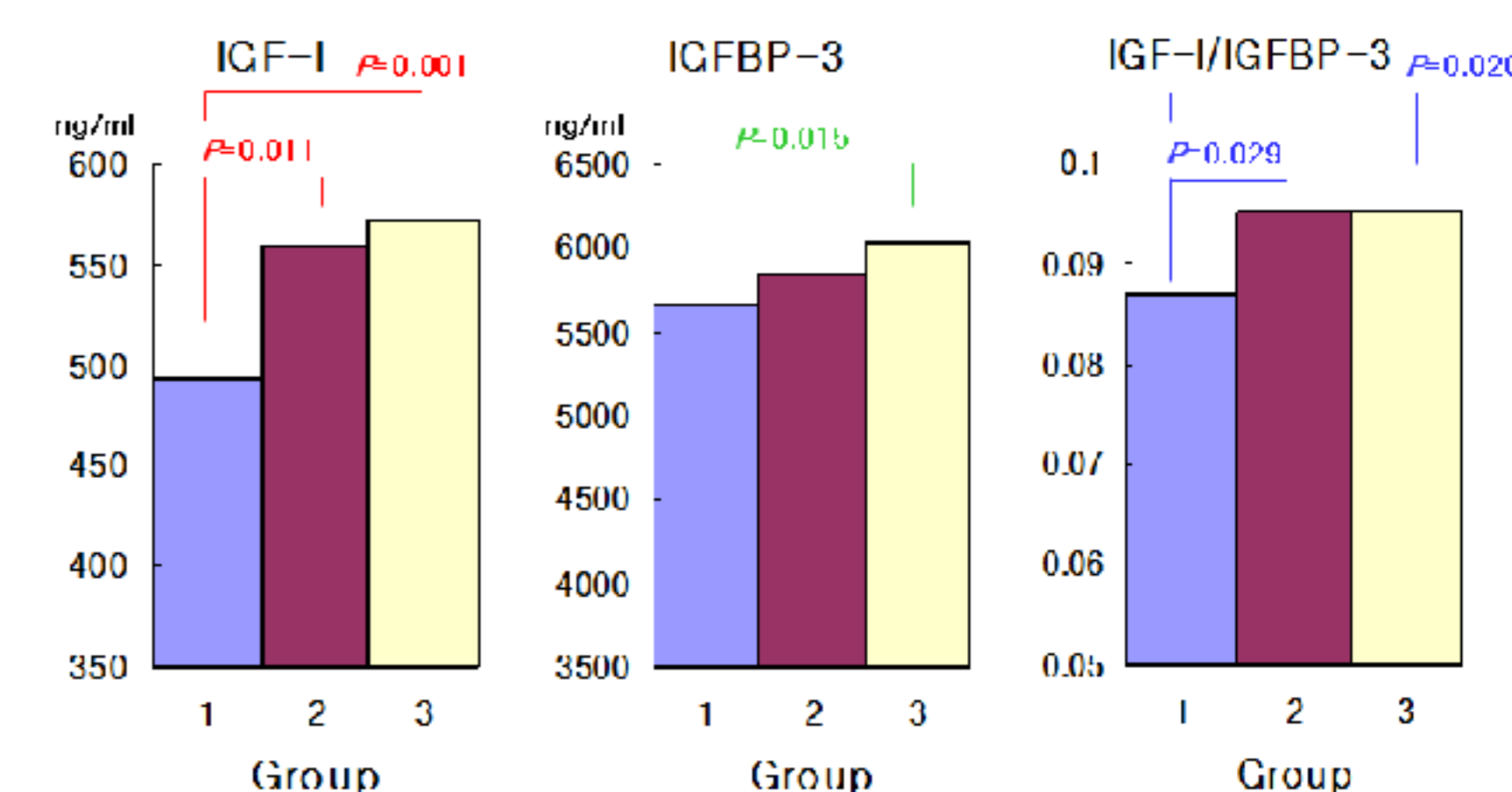


Table 1. Mean circulating IGFBP-3 concentrations according to group and IGFBP-3 genotype

Group	Genotype (n)	IGFBP-3* (ng/mL)	P value**
1 (short)	AA (29)	5860±596	0.035
	AC (17)	5463±594	
	CC (2)	4476±153	
2 (mean)	AA (23)	6079±707	0.047
	AC (25)	5669±686	
	CC (1)	5113±000	
3 (tall)	AA (27)	6178±612	0.161
	AC (18)	5867±854	
	CC (4)	5609±1006	

\* circulating IGFBP-3 concentrations shown by mean±SD  
 \*\* P values for IGFBP-3 levels within groups, AA vs. AC or CC  
 \*\*\* not determined

Table 2. IGF-I/IGFBP-3 ratio according to group and IGFBP-3 genotype

Group	Genotype (n)	IGF-I/IGFBP-3*	P value**
1 (short)	AA (29)	0.085±0.015	0.461
	AC (17)	0.089±0.021	
	CC (2)	0.099±0.034	
2 (mean)	AA (23)	0.093±0.016	0.403
	AC (25)	0.097±0.017	
	CC (1)	0.097±0.000	
3 (tall)	AA (27)	0.091±0.016	0.072
	AC (18)	0.100±0.017	
	CC (4)	0.105±0.010	

\* IGF-I/IGFBP-3 ratio shown by mean±SD  
 \*\* P values for IGF-I/IGFBP-3 ratio within groups, AA vs. AC or CC  
 \*\*\* not determined

## Conclusions

The -202 polymorphism in the IGFBP3 promoter region is assumed to affect the serum concentration of IGFBP-3 in children as well as in adults. However, it is unclear whether this affects physical development according to the concentration of IGFBP-3.

