

Growth Status of children and adolescent born Full Term Small for Gestational Age in Korea

Data from the KNHANES-V (2010-2011)



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Introduction

- Infant born small for gestational age (SGA) may show persistent stunted growth and resulted in short stature in adulthood
- Swedish study showed the long-term risk of short stature up to 18 years in SGA infants based on a large population
- In Asian, the detailed information about the relative risk of short children or short stature in the adult who were born SGA is not available

Purpose

- To describe the postnatal growth pattern and percentage of catch-up of subjects born SGA.
- To find the factors affecting catch-up growth of SGA subjects.

Subjects and methods

1. Subjects

We analyzed 3,524 subjects (1,831 male, 1,693 female) born as a full-term singleton with birth weight and anthropometric data who participated 5th Korea National Health and Nutrition Examination Survey (KNHANES V) (2010–2011).

2. Method

We first assessed the prevalence of **short stature** (height < 3rd percentile) and **near short stature** (height < 10th percentile) according to SGA and non-SGA group. A logistic regression model was used to determine the independent association between current short stature and SGA status. The odds ratios (ORs) of short stature for SGA, were calculated before and after adjusting for other covariates.

3. Statistical analyses

All statistical analyses were performed using SPSS 17.0 for Windows.

Result

1. The characteristics of the study subjects

	SGA	non SGA	Total	P-value
Number	471	3053	3524	
Gestational Age (weeks)	39.7 ± 1.0	39.6 ± 1.1	39.6 ± 1.1	0.193
Birth weight (g)	2684 ± 213	3374 ± 356	3281 ± 413	<0.001
Sex				0.358
Male	254	1577	1831	
Female	217	1476	1693	
Father's age (years)	31.9 ± 4.4	32.5 ± 4.2	32.4 ± 4.2	0.023
Mother's age (years)	29.2 ± 4.2	29.7 ± 3.9	29.6 ± 4.0	0.012
Father's height (cm)	171.0 ± 5.8	172.0 ± 5.8	171.8 ± 5.8	0.004
Mother's height (cm)	157.7 ± 5.5	159.5 ± 5.2	159.3 ± 5.3	<0.001
Mid-parental height (cm)	164.3 ± 4.2	165.8 ± 4.2	165.6 ± 4.2	<0.001
Father's short stature (%)	17/321 (5.3)	60/2202 (2.7)	77/2523 (3.1)	0.012
Mother's short stature (%)	23/430 (5.3)	75/2869 (2.5)	98/3299 (3.0)	0.002
Income quartiles (%)				0.067
Inferior	40 (8.6)	256 (8.5)	296	
Inferior-middle	155 (33.5)	868 (28.7)	1023	
Middle-superior	159 (33.5)	1028 (34.0)	1187	
Superior	109 (23.5)	872 (28.8)	981	

* Father's short stature is defined as height < 163cm and mother's short stature is defined as < 150cm (< 3rd percentile).

- The prevalence of SGA, when using 10th percentile for birth weight, was **13.4%** (2.2% using 3rd percentile).
- Subjects born SGA had shorter mid-parental height than non-SGA subjects (all, $P < 0.01$).
- The ORs of SGA depending short mid-parental height (less than 3 percentile) were **1.996** (95% CI, 1.150-3.466), **2.105** (95% CI, 1.305-3.397), and 1.526 (95% CI, 0.828-2.814).

2. Current short stature and near short stature in total subjects

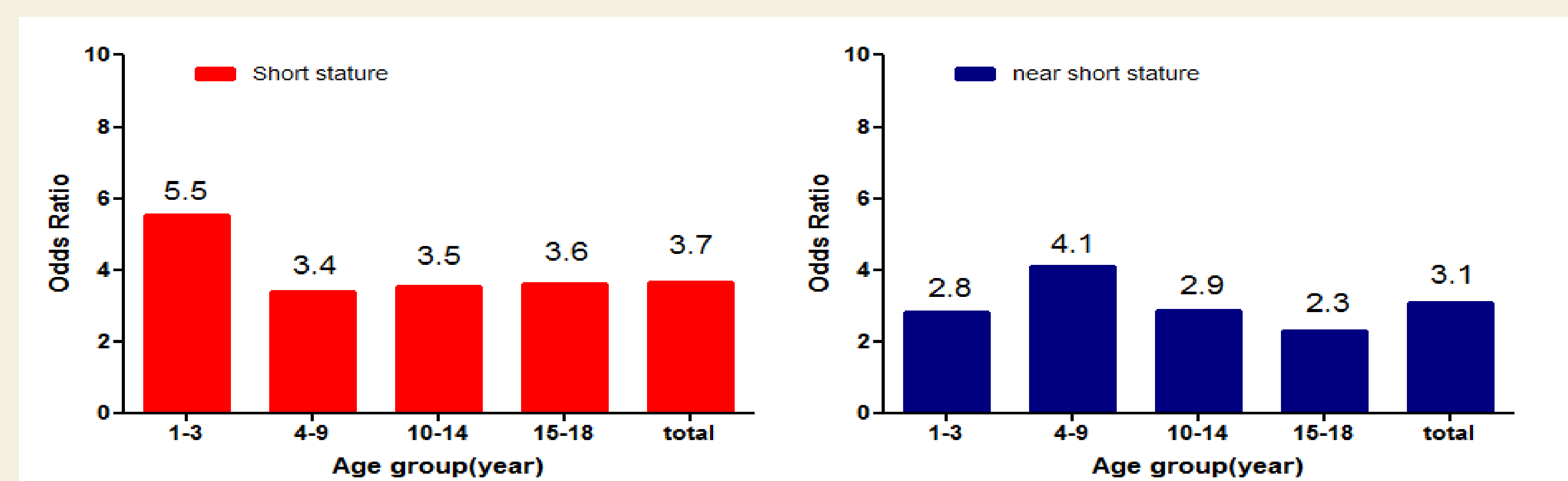
- The number of short stature and near short stature were 77/3524 (2.2%) and 471/3524 subjects (13.4%).
- Among total 77 short stature subjects, 28 subjects (**36.4%**) were born SGA.
- The prevalence of short stature at the examination in subjects born SGA was 5.9%, while 1.6% in non-SGA subjects (near short stature: SGA vs. non-SGA; 16.3% vs. 5.8%).

3. Catch up growth vs. non-Catch-up growth in SGA subjects

	Non-CUG	CUG	P-value
Number	28	443	
Sex			0.397
Male	13	241	
Female	15	201	
Gestation (weeks)	39.6 ± 1.0	39.7 ± 1.0	0.817
Birthweight (g)	2654 ± 166	2686 ± 215	0.336
Father's age (years)	31.2 ± 3.7	31.9 ± 4.5	0.334
Mother's age (years)	28.0 ± 3.6	29.2 ± 4.2	0.081
Father's height (cm)	168.4 ± 4.7	171.1 ± 5.9	0.019
Mother's height (cm)	154.9 ± 4.6	157.9 ± 5.6	0.003
Mid-parental height (cm)	161.2 ± 3.5	164.5 ± 4.2	<0.001
Father's short stature (%)	0/21(0)	17/300 (5.7)	0.262
Mother's short stature (%)	2/28(7.1)	21/402 (5.2)	0.663
Mid-parental height < 3percentile	3/21 (14.3)	10/288 (3.5)	0.017
Father's near short stature (%)	7/21 (33.3)	38/300 (12.7)	0.008
Mother's near short stature (%)	11/28 (39.3)	56/402 (13.9)	<0.001
Income quartiles			0.396
Inferior	1	39	
Inferior-middle	12	143	
Middle-superior	8	151	
Superior	7	102	

- Twenty eight (5.9%) subjects failed to catch-up.
- The CUG subjects had higher **father's height, mother's height, mid-parental height, and current BMI** (all, $P < 0.05$).
- There were no differences in CUG depending on sex and socio-economic status

4. The OR of short stature and near short stature of SGA according to the age



Conclusion

- In this study, the prevalence of short stature was 5.9% and near short stature was 16.3% in subjects born SGA.
- We found that born SGA is associated with reduced current height and final height in Korean children and adolescent.
- We also found that SGA subjects had a significant reduction in parental height; maternal height was more reduced than was paternal height
- In addition, mid-parental height and BMI of the current state is a factor for catch-up growth in Korean SGA
- This finding confirm the Ong's hypothesis that earlier age at menarche of mother might lead their offspring to shorter adult stature due to earlier completion of growth.
- This study is the first to analyze short stature status born SGA less than 18.99 years based on national comprehensive population in Asia.

References

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