

A case report on the effects of Jogyeongseongjang-tang on a boy with reduced predicted adult height(PAH) due to pubertal development during growth hormone(GH) treatment

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Introduction

Growth hormone (GH) therapy is commonly used to treat children with short stature. However, early onset of puberty during GH treatment can reduce final adult height due to premature closure of growth plates. Subsequently, researches on combined therapy using GH and pubertal hormone suppression treatments have been conducted internationally. This study explores the effects of Jogyeongseongjang-tang, a traditional Korean herbal medicine, on a male patient whose growth was compromised by accelerated puberty during GH therapy.

METHODS

Patient Profile

- Sex/Age:** M/11
- Chief Complaint:** Below-average Predicted adult height(PAH)
- Current History:** Initially treated with GH injections but experienced accelerated puberty. There were no signs of voice change or pubic hair development, but body odor intensified, and significant increases in luteinizing hormone (LH) and follicle-stimulating hormone (FSH) were observed, indicating sexual maturation.
- Initial Physical Examination:**

	Height(cm)	Weight(kg)	Body fat(%)	BMI(kg/m ²)
2018.10.24.	145.6	46.0	20.5	21.6

Treatment

- Herbal Formula:** Jogyeongseongjang-tang, administered twice daily.

Herb	Scientific name	Dose (g)
薏苡仁	Coix lachrymal-jobi L.	15
茵陳	Artemisia capillaris Thunb.	8
蓬朮	Curcuma zedoaria Rosc.	3
薑黃	Curcuma longa L.	3
陳皮	Citrus reticulata	3
枳實	Citrus aurantium L.	3
豬苓	Polyporus umbellatus (Pers.) Fries	3
藿香	Agastache rugosa (Risch. Et Meyer) O. Kuntze	3
蒼朮	Atractylodes lancea (Thunb.) DC.	3
連翹	Forsythia suspensa (Thunb.) Vahl	3
蘇葉	Perilla frutescens var. acuta Kudo	3
酸棗仁	Zizyphus jujube Miller var. spinosa	3

- Duration:** 3 years (October 24, 2018 - October 2, 2021)
- Monitoring:** Regular measurements of height, weight, hormone levels (IGF-1, LH, FSH, testosterone, and liver function), and bone age.
- Efficacy Evaluation:** Comparison of predicted adult height and final height.

RESULTS

Growth Improvement

- **Height Growth**
 - ✓ **First 12 Months:** Increased by 8.7 cm.
 - ✓ **Second 12 Months:** Increased by 10.9 cm.
 - ✓ **Third 12 Months:** Increased by 7.2 cm.
 - ✓ **Post-Treatment (4 Months):** Additional growth of 1.6 cm.
- **Final Height:** 174 cm, surpassing the initial PAH of 168-170 cm.

	Height (cm)	Weight (kg)	Body fat(%)	BMI (kg/m ²)
2018.10.24.	145.6	46.0	20.5	21.6
2019.04.27.	150.3	48.4	20.2	21.5
2019.10.26.	154.3	51.9	20.6	21.9
2020.03.28.	159.3	55.7	20.4	22.0
2020.09.26.	164.6	61.3	18.6	22.5
2021.02.27.	168.3	65.0	18.6	23.0
2021.10.02.	172.4	71.2	18.4	24.1
2022.2.20.	174.0			

Hormone Regulation

- Hormonal levels (IGF-1, LH, FSH) remained within normal ranges during treatment.
- No adverse effects were observed

	IGF-1 (ng/ml)	LH (mIU/mL)	FSH (mIU/mL)	Testosterone (ng/ml)
2018.04.05.	200.71	0.18	2.71	<0.03
2018.10.15.	490.91	0.31	3.96	<0.03
2019.04.20.	464.06	0.52	3.97	<0.03
2019.12.21.	469.33	1.81	6.73	1.73
2020.05.30.	505.09	2.67	6.79	2.26

DISCUSSION & CONCLUSIONS

Jogyeongseongjang-tang demonstrated significant potential both in extending growth and delaying puberty progression. In the field of Korean Medicine, case reports in herbal medicine have focused on growth or sexual hormone restriction until now, and this is the first case to use a prescription targeting both to overcome the limits of GH injection treatment. Suggests the need for larger-scale studies to further validate these findings and develop standardized treatment protocols.

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