

A case report on the effects of Jogyeongseongjang-tang on a boy with slowed growth during treatment with gonadotropin-releasing hormone agonist (GnRHa) for precocious puberty

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Introduction

Precocious puberty is characterized by the early onset of secondary sexual characteristics, leading to accelerated bone maturation and potentially reduced final adult height (FAH). The standard treatment involves the use of gonadotropin-releasing hormone agonists (GnRHa) to delay puberty. However, GnRHa can slow growth rates. This case report explores the effectiveness of Jogyeongseongjang-tang, a traditional Korean herbal medicine, in managing growth delays associated with GnRHa treatment in a male patient.

METHODS

Patient Profile

- Sex/Age:** M/11
- Chief Complaint:** Slowed growth during GnRHa treatment
- Treatment History:** Diagnosed with precocious puberty and treated with leuporelin acetate (Lupron Depot) for two years. During this period, bone age advanced to 13 years exceeding his chronological age and the patient experienced a subjective slowing of growth.
- Initial Physical Examination**

	Height(cm)	Weight(kg)	Body fat(%)	BMI(kg/m ²)
2022.04.25	156.5	45.5	16.2	18.5

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

Methods

- Duration:** 684 days (April 23, 2022 - March 7, 2024)
- Monitoring:** Regular measurements of height, weight, body fat, hormone levels(IGF-1, LH, FSH, testosterone, 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 9.7 cm,
 - ✓ **Following 11 Months:** Increased by 6.5 cm
- Final Height:** 172.7 cm, surpassing the initial PAH of 170 ± 2 cm.
- Body Fat:** Reduced from 16.2% to 9.1%

	Height (cm)	Weight (kg)	Body fat(%)	BMI (kg/m ²)
2022.04.23.	156.5	45.5	16.2	18.5
2022.11.08.	161.6	55.5	13.1	21.1
2023.04.01.	166.2	57.1	8.3	20.7
2023.08.09.	169.4	61.0	9.5	21.4
2024.03.07.	172.7	65.6	9.1	21.9

Hormonal Regulation:

- Post-GnRHa, there was an increase in sex hormones corresponding to puberty development levels.
- Consistent use of Jogyeongseongjang-tang helped maintain lower sex hormone levels, stabilizing the growth process.

	IGF-1 (ng/ml)	LH (mIU/mL)	FSH (mIU/mL)	Testosterone (ng/ml)	ALP (U/L)
2022.04.25.	294.24	0.18	0.70	0.30	282
2022.08.09.	532.17	7.18	7.44	3.41	238
2022.11.09.	500.33	4.37	6.94	3.89	526
2023.02.02.	466.60	2.40	5.60	2.75	427
2023.05.03.	413.17	2.11	2.88	2.16	401
2023.08.10.	447.19	2.35	3.03	4.05	339
2024.03.16.	382.66	2.08	2.12	3.44	295

DISCUSSION & CONCLUSIONS

Jogyeongseongjang-tang effectively complemented the growth process, leading to significant height gain despite the prior deceleration due to GnRHa. The treatment successfully regulated sex hormones and supported continued growth, demonstrating the potential of traditional Korean medicine as a viable treatment for growth delays associated with GnRHa. This case suggests that Jogyeongseongjang-tang could be a promising alternative or supplementary treatment in managing growth during puberty, particularly in boys. Larger, randomized studies are necessary to further explore the efficacy and safety of traditional Korean medicine in similar cases.

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