

Growth hormone monotherapy versus Combined GH and LHRH analog in 2 sisters with short stature, early pubertal development, and advanced bone age (BA).

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INTRODUCTION

There is still a debate on the effect of combined treatment with growth hormone (GH) and a luteinizing hormone-releasing hormone (LHRH) analog versus GH alone on final adult height in children with idiopathic short stature (ISS) and those who have early pubertal development at a short height.

Case Report

Two sisters with a history of familial short stature, early puberty and advanced bone age at presentation.

Both of them presented to the endocrine clinic with the same presentation at the same age, in two different times.

(R) presented with breasts Tanner 3 and was menstruating for 9 months. She was treated with GH monotherapy (0.05 mg/kg/day) for 2 years until her final adult height (FAHt).

(D) presented at the same age with breast Tanner 3 and menstruated once. She received combined GH and LHRH-a therapy and still on treatment. (Table)

At presentation **(D)** was significantly shorter (difference 1.84 SDS)

| | R | D |
|------------------|-------------------------|----------------------|
| Presentation age | 10.5 years old | 10.5 years old |
| Menarche | +++ (since 9 months) | + (since 1 month) |
| HtSDS | 0.34 | -1.5 |
| MPHtSDS | -1.5 | -1.5 |
| BMISDS | 1.47 | 0.85 |
| Bone age SDS | +1 | +1.5 |

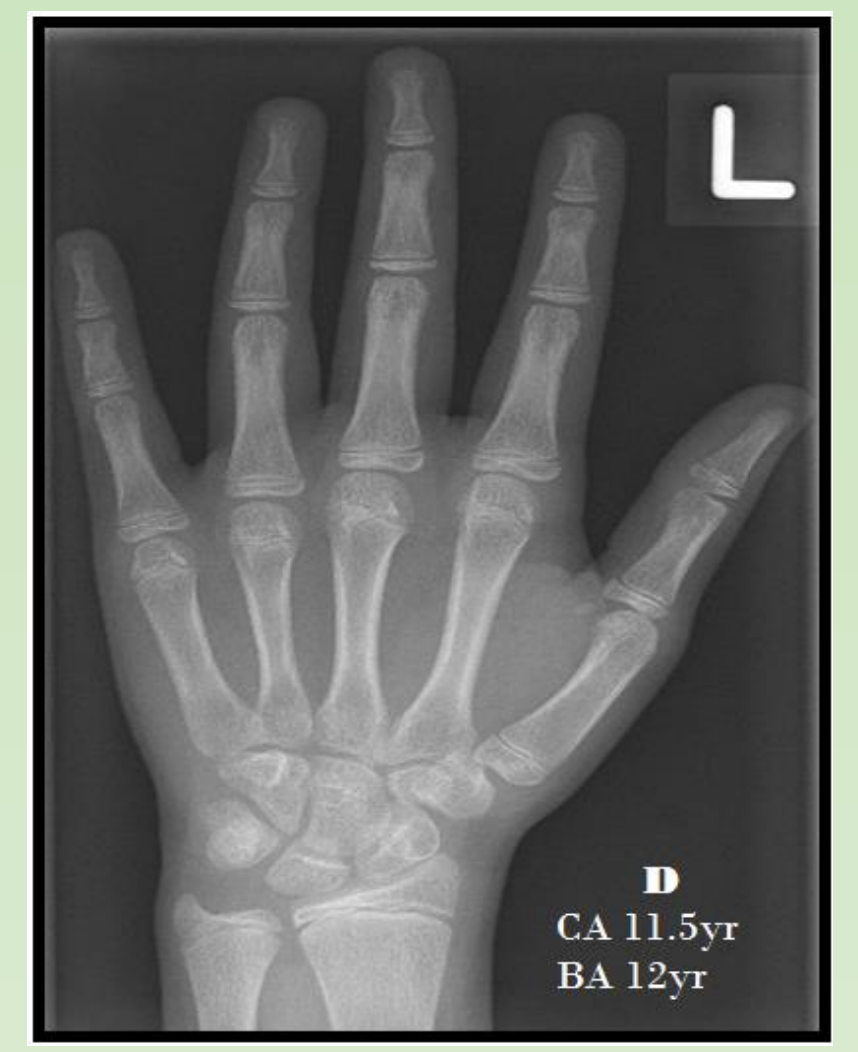
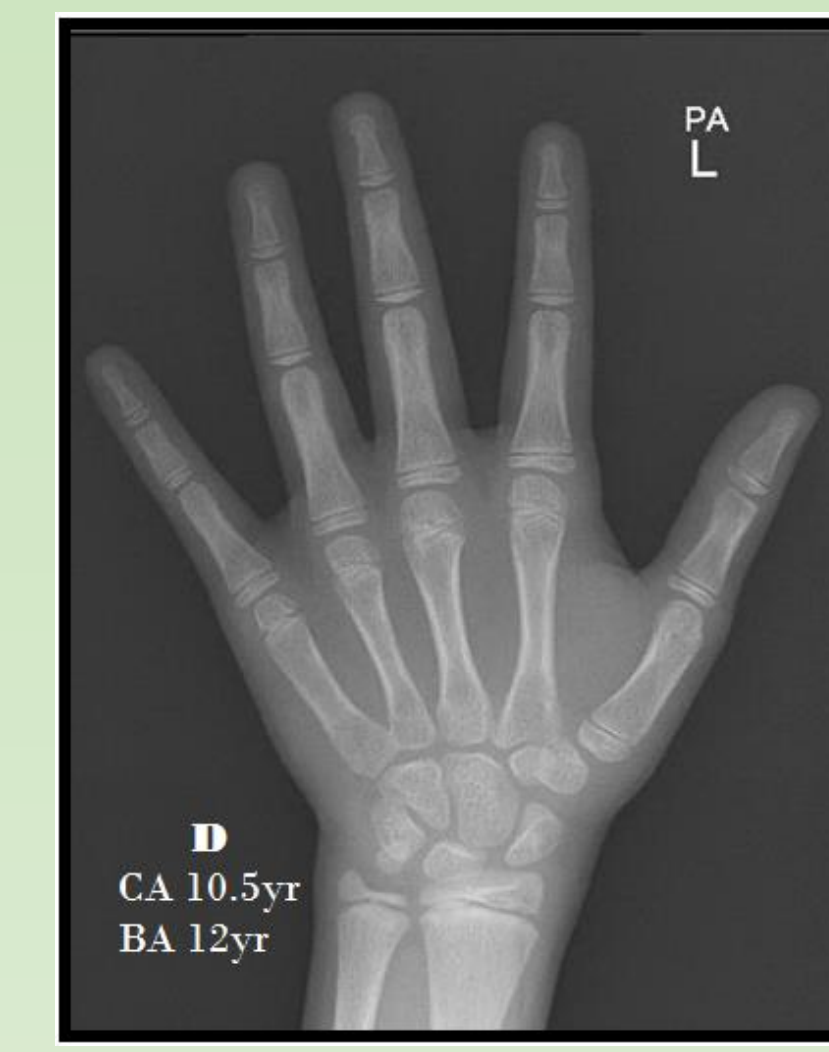
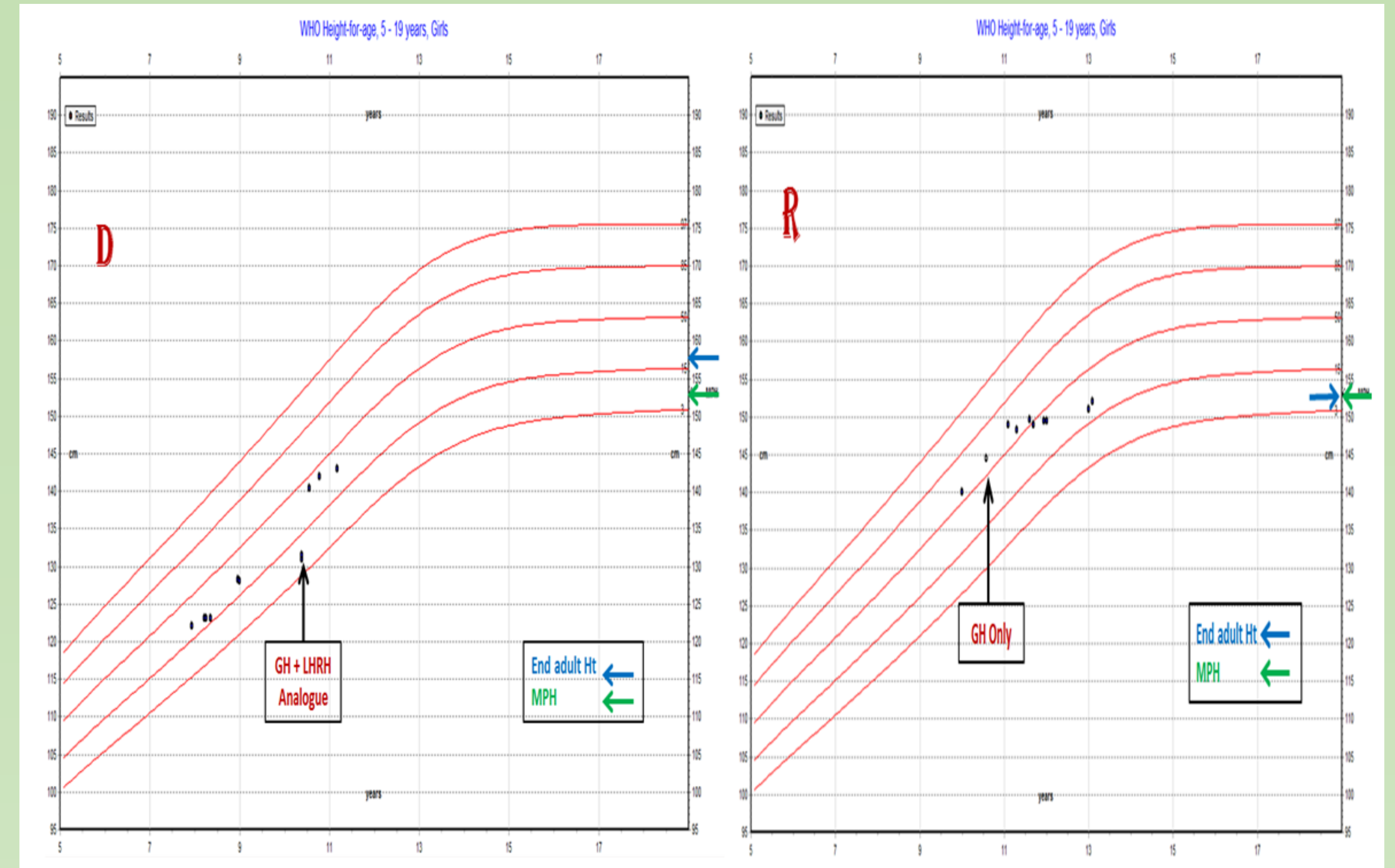
Intervention

(R) was treated with GH monotherapy (0.05 mg/kg/day) for 2 years until her final adult height (FAHt).

(D) received combined GH and LHRH-a therapy and still on treatment.

Post intervention follow up

| | R | D |
|--------------------|-------------|-----------------------------|
| Intervention | GH therapy | LHRH analogue GH therapy |
| Age 2 | 11.5 | 11.5 |
| HtSDS | 0.06 | -0.54 |
| BMISDS | 1.72 | 0.79 |
| Annualized GV/year | 5cm/year | 6.9cm/year |
| Annualized GVSIDS | -0.7 | 0.9 |
| Bone age SDS | ---- | +0.5 |
| End adult Ht* | 152cm | 157.8*** |
| HtSDS | -0.73 | -0.89 |



Follow up and Result

1 year follow up :

(D) showed significant improvement in HtSDS, GV and GVSIDS (LHRH-a + GH effect) in comparison to her sister **(R)** who received GH monotherapy, with a change in HtSDS = +1 in **(D)** versus -0.28 in **(R)**.

The combined therapy resulted in a deceleration of bone aging that increased the potential of FAHt.

2 year follow up :

(R) Received GH for 2years stopped therapy when she achieved final adult height (152cm, SDS -0.73) in comparison to her MPHSDS -1.5.

The predicted FAHt for **(D)**, who was shorter at presentation, proved that she will be taller than her sister (157.8 cm, -0.89)

CONCLUSION

In these sisters with advanced BA and early puberty, the combined LHRH-a + GH therapy proved to be more beneficial for height growth compared to GH monotherapy.

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