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Final height in oncological growth hormone deficient (GHD) children after growth hormone (GH) therapy

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Background: Growth hormone deficiency (GHD) is the most prevalent hypothalamic-pituitary (HP) disorder found in childhood cancer survivors (CCS). The published studies assessing GHD in CCS concluded that recombinant human GH (rhGH) does not restore final height (FH) to that predicted from mid-parental height (MPH). Thus, wider analyses on final height outcomes after rhGH in CCS are needed.

Aim: retrospective observational single-centre study performed at The Royal Marsden Hospital to evaluate GH efficacy as 1st and 2nd year response, FH, height loss (HL) at FH (ΔFH-MPH SDS) and the contribution of several independent variables to FH. Moreover we ought to assess response differences between patients who received rhGH alone and patients with combined rhGH/GnRHa therapy (n=19) for associated central precocious puberty (CPP) or early puberty (EP).

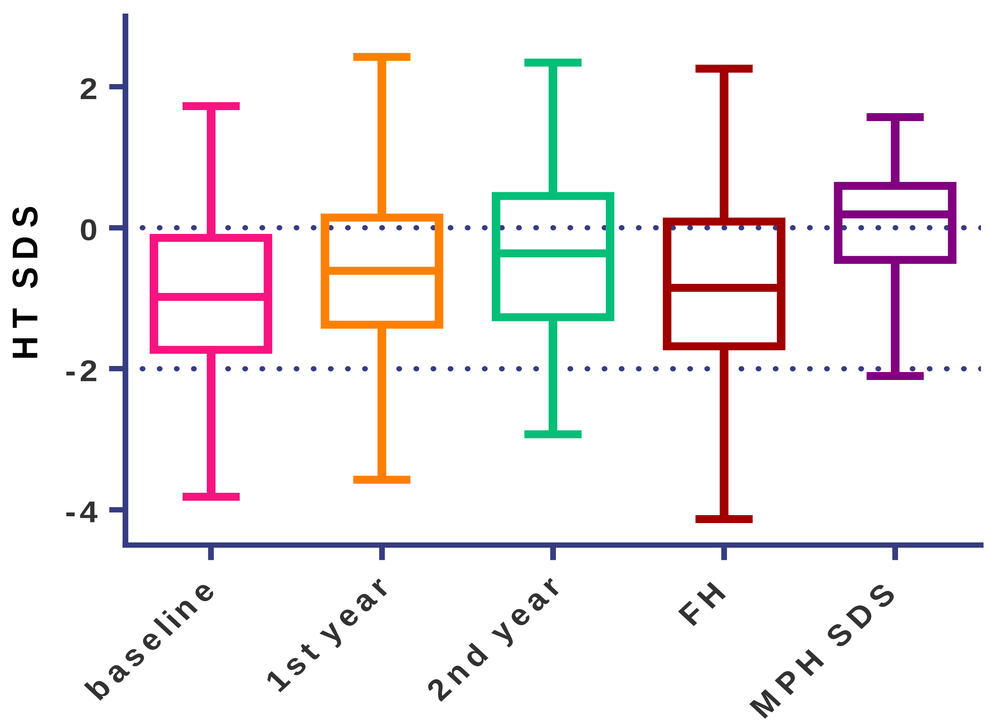
Patients:

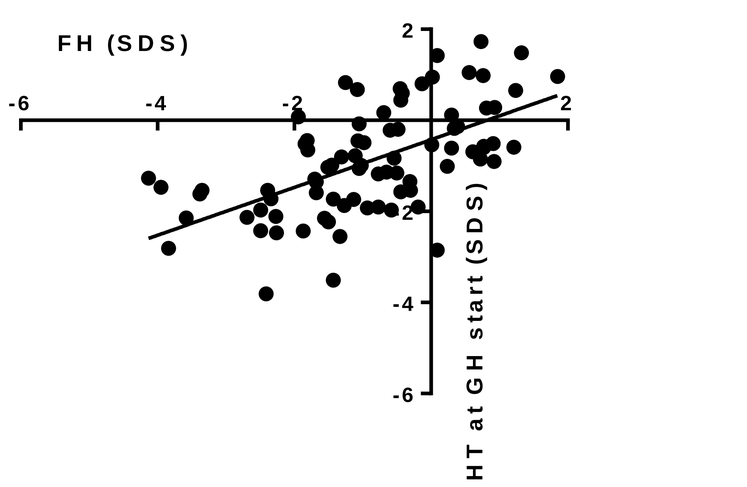
- **87 CCS patients (M=54)**

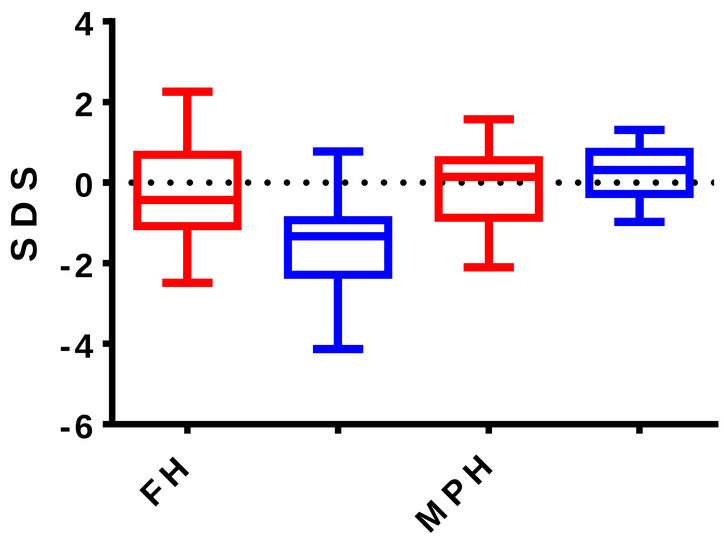
- medulloblastoma (n=23),
- leukemia (n=20),
- glioma (n=18),
- craniopharyngioma (n=13),
- germ cell tumour (n=6),
- rhabdomyosarcoma (n=3),
- ependymoma (n=2),
- lymphoma (n=1),
- atypical teratoma (n=1).

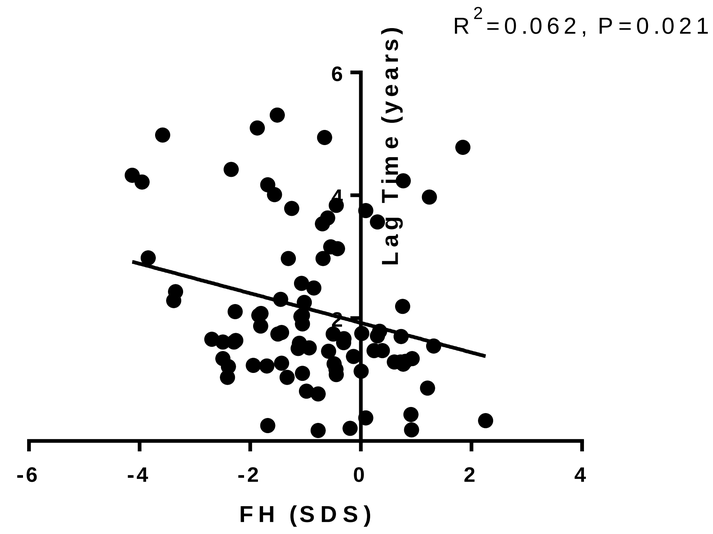
Results:

- Height (HT) gain after 1 and 2 years of rhGH was 0.38±0.35SDS and 0.18±0.30SDS respectively (*P*<0.0001).
- Mean FH was in the normal range (-0.85±1.34SDS), though not significantly different from HT SDS at baseline.
- 67% patients overall failed to reach MPH especially in Group B (*P*<0.0001).
- HL (HT SDS-MPH SDS) at FH improved or remained stable compared to baseline in 26/45 patients (58%).
- On stepwise regression analysis, major determinants of FH were HT at baseline (*P*<0.0001) and delay before start of rhGH (*P*=0.012).
- There was no significant difference in FH when GnRHa was added to rhGH.









Group A (n=48): cranial RT (n=40) & non irradiated (n=8)
Group B (n=39): craniospinal (n=23) & TBI (n=16)

Conclusion: rhGH and GnRH analogues therapy, when indicated, though failing to induce catch-up growth, prevented further height loss leading to a FH within the normal range but still below MPH, this latter being statistically significant in children who received craniospinal and TBI.

References

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2. Sklar CA, Antal Z, Chemaitilly W, Cohen LE, Follin C, Meacham LR, Murad MH (2018) Hypothalamic-Pituitary and Growth Disorders in Survivors of Childhood Cancer: An Endocrine Society Clinical Practice Guideline. J Clin Endocrinol Metab 103(8):2761–2784

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