Do insulin like growth factors also influence growth in children with congenital hypothyroidism: a cohort analysis

SANGEETA YADAV, RUCHI GOEL, TK MISHRA, MUKTA MANTAN
Department of Pediatrics & Department of Biochemistry, MAULANA AZAD MEDICAL COLLEGE
and associated Lok Nayak Hospital & GIPMER Hospital, New Delhi, India

BACKGROUND

- Thyroid & GH- insulin like growth factors (IGF) axis together are critical for somatic & skeletal growth. Hypothyroidism & derangement in this axis leads to profound growth retardation & delayed skeletal maturation.
- Limited studies suggest that thyroxine directly regulate IGF-1 independent of GH.

OBJECTIVE

To evaluate levels of insulin like growth factors (IGF) in children with congenital hypothyroidism and their role on growth parameters.

MATERIALS AND METHODS

- Approved by ethical committee of institute and consent taken
- Study design- Cross sectional
- Thirteen children with congenital hypothyroidism 1month- 15 years old recruited. Those with underlying GH deficiency and/or deranged liver functions were excluded.
- Height, weight, weight for height or body mass index recorded & interpreted on WHO growth charts for <5 year old & on New IAP growth charts for ≥5 years.
- Estimation of thyroid profile done by electro-chemiluminiscence and IGF-1, IGF binding protein-3 (IGFBP-3) by enzyme linked immunoassay (ELISA).

REFERENCES

1. Inukai T,et al. Horm Metab Res,1999
2. Soliman AT, et al. Textbook of Current topics in hypothyroidism with focus on development. Eliska Potlukova, ISBN, 2013
3. Soliman AT,et al. J Trop Pediatr,2008
4. Volzke H,et al. J Clin Endocr Metab.2007
5. Purandare A,et al. J Pediatr Endocrinol Metab. 2003

RESULTS

- Mean age of diagnosis- 1.65 ± 1.62 years with a range of 25 days to 4 years.
- Mean age of recruitment in the study- 7.76 ± 3.6 years
- Mean weight- 21.46 ± 9.41 kgs (-0.58SD), only 4/13 (30.7%) were underweight
- Mean height- 112.68 ± 22.11 cms (-2.1SD), 7/13 (53.8%) were stunted
- BMI (kg/m^2)- 16.15 ± 2.43 (+0.26SD)- 11/13 (84.6%) had normal BMI
- Significant positive correlation observed between serum TSH and BMI (r= 0.538, p= 0.004)
- *No significant correlation between TSH & height (r=0.07, p>0.05)*

BIOCHEMICAL PARAMETERS	
TSH (0.7-6.4 µIU/ml)	12.91±18.05
T4 (4.6-12 µg/dl)	5.36±4.72
T3 (2.3-4.2 pg/ml)	2.73±1.48
IGF 1 (ng/ml)	103.34±81.38*
IGFBP 3 (ng/ml)	2260.6±1594.2*

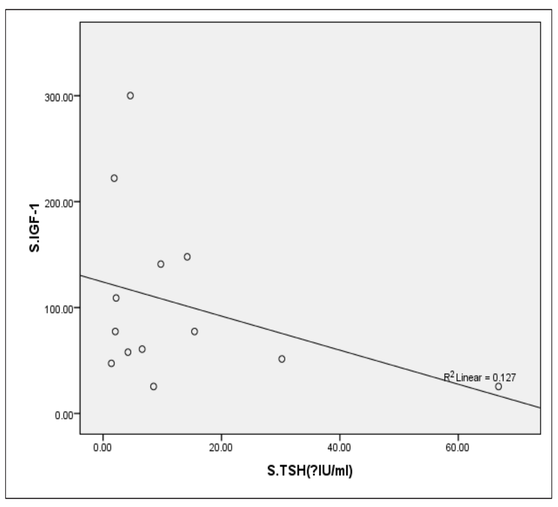
✓ Positive correlation observed between height & serum levels of both IGF-1 & IGFBP-3.

Height (SD)	N=13	IGF-1 levels (ng/ml)	IGFBP-3 levels (ng/ml)
<-2SD	7 (53.8%)	70.58 ± 38.5	1685.14 ± 1297.9
-2 to 0 SD	3	127.56 ± 86.84	2935.3 ± 1073.7
0 to +2SD	3	155.54 ± 137.9	2928.67±2555.6

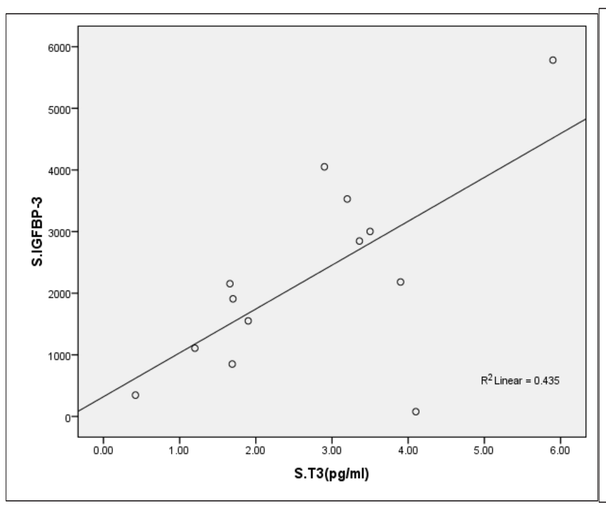
*Mean IGF-1 and IGFBP-3 was significantly low (<0.05) as compared to healthy reference population.

CORRELATION OF THYROID PROFILE WITH INSULIN LIKE GROWTH FACTORS:

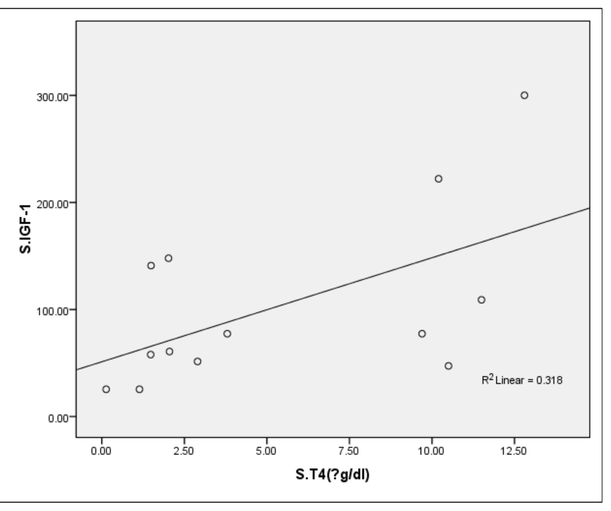
TSH & IGF-1 (r= -0.35, p>0.05)



T3 & IGFBP-3 (r=0.66 ,p=0.014)



T4 & IGF-1 (r=0.564, p=0.045)



Hence significant correlation observed between T3, T4 and Insulin like growth factors.

On plotting ROC curve: IGF-1 cut off value of 93.2 ng/ml has a sensitivity of 85.7 % and specificity of 66.7% in predicting stunting (height <-2SD) in our cohort study (AUC=0.679)

Disclosure: No conflict of interest to the best of my knowledge

CONCLUSION:

- 53.8% children were stunted with overall mean height of the cohort at -2.1SD. Though their mean TSH was only mildly increased with normal serum T3, T4.
- Mean IGF-1, IGFBP-3 were significantly low as compared to age & sex matched normal population.
- Children with stunting had low levels of serum insulin like growth factors.
- Growth retardation observed seems to be attributed significantly to reduced levels of insulin like growth factors.

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