Role of insulin like growth factors on the growth parameters in children with acquired hypothyroidism

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BACKGROUND

- Thyroid hormones have an important role in somatic & skeletal growth by regulating the Growth hormone- insulin like growth factor (IGF) axis
- Growth retardation seen in acquired hypothyroidism manifests later in life which according to limited studies on Indian children is attributable to both thyroid profile and IGF.

OBJECTIVE

To evaluate Insulin like growth factors in children with acquired hypothyroidism and their effect on the growth parameters

MATERIALS AND METHODS

- Approved by ethical committee of institute
- Study design- Cross sectional
- Twenty seven children with acquired hypothyroidism aged 5- 18 years old recruited and evaluated after taking consent
- Growth hormone deficient or multiple pituitary hormone deficient or children with altered liver functions were excluded
- Height, weight, body mass index (BMI) recorded & interpreted on New IAP growth charts 2015.
- Estimation of thyroid profile done by electro-chemiluminiscence and IGF-1, IGF binding protein-3 (IGFBP-3) by enzyme linked immunoassay (ELISA) kit.

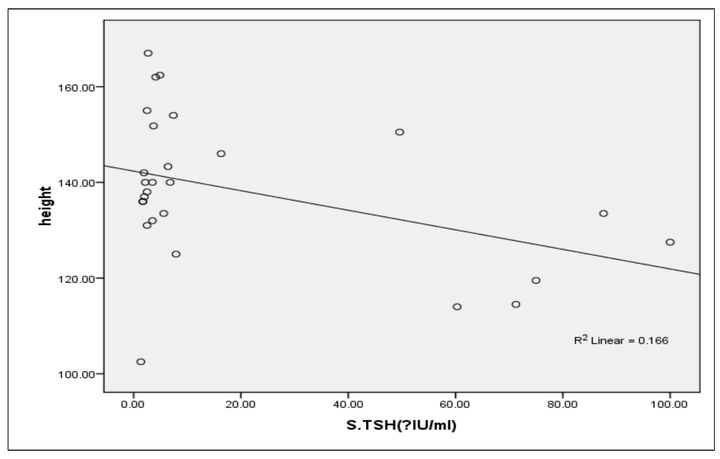
BIOCHEMICAL PROFILE	
T3 (2.3-4.2 pg/ml)	2.62±1.81
T4 (4.6-12 µg/dl)	6.76±4.97
TSH (0.7-6.4 µIU/ml)	19.81±30.7
IGF 1 (ng/ml)	206.5±1.13*
IGFBP 3 (ng/ml)	4493±2375.67

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

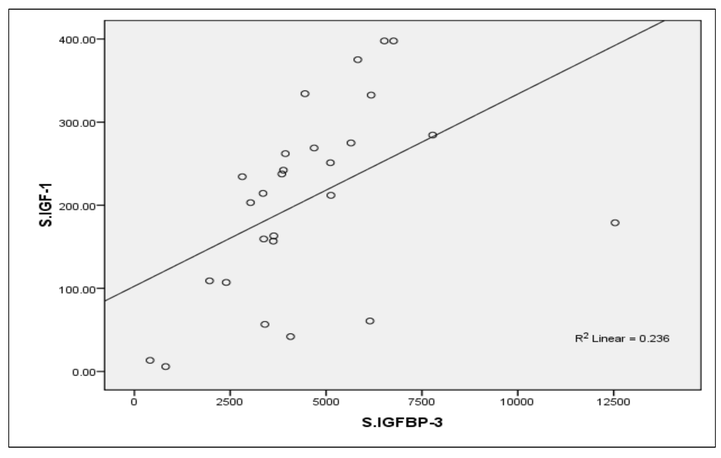
RESULTS

- Mean age of diagnosis- 9.52 ± 2.31 years with a range of 5 to 13 years with the Male : Female ratio of 0.42:1.
- Mean age of recruitment in the study- 13.77 ± 3.09 years
- Mean weight- 35.89±11.67 kg (-1.09SD), only 5/27 (18.5%) were underweight
- Mean height- 138 ± 15.4 cms (-2.53SD), 15/27 (55.5%) were stunted
- BMI (kg/m^2)- 18.25 ± 3.26 (-0.34SD)- 23/27 (85.1%) had normal BMI
- Negative correlation observed between TSH & IGF-1 though p>0.05

Significant negative correlation between TSH & height (r=-0.408, p=0.035)



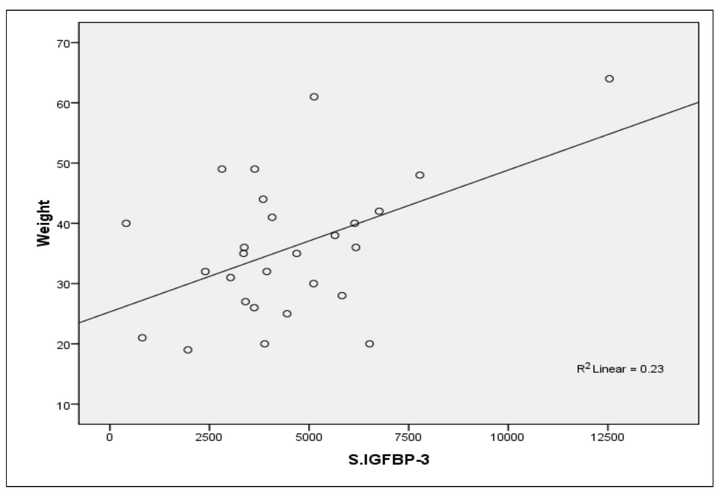
Significant correlation observed in between serum levels of IGF-1 & IGFBP-3 (r= 0.486, p= 0.010).



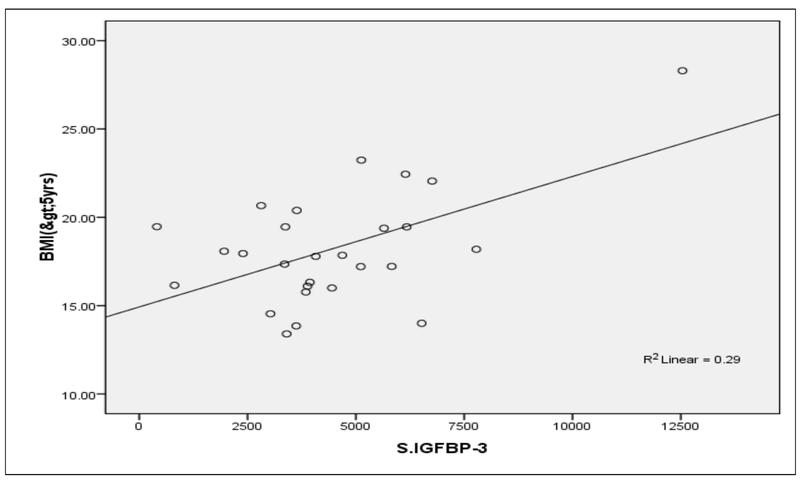
EFFECT OF INSULIN LIKE GROWTH FACTORS ON ANTHROPOMETERY

- Positive correlation between height & IGF-1 (p>0.05).
- No correlation of IGFBP-3 was observed with height or TSH.

Significant correlation between weight & serum IGFBP-3 (r= 0.479, p = 0.011)



Significant correlation between BMI & serum IGFBP-3 (r= 0.538, p=0.004)



CONCLUSION

- Height is the most affected growth parameter with 55.5% of the cohort (15/27) being stunted.
- Growth retardation is attributable to both abnormal thyroid profile and reduced levels of serum IGF-1.
- IGFBP-3 had positive role in weight and BMI of children with acquired hypothyroidism though no role was established with stunting.

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