the normal range. Different GH treatment strategies to achieve this goal include titration of GH dose according to serum insulin-like growth factor I (IGF-I) concentrations. However, IGF-I levels do not always correlate well with the growth response. The purpose of this study is to identify the factors affecting IGF-I concentration in each disease and to correct the related factors and then to identify the relationship between IGF-1 and treatment response. Methods: In this study, data of pre-pubertal children with idiopathic growth hormone deficiency (IGHD), organic GHD (OGHD), Turner syndrome (TS), small for gestational age (SGA) who were treated with recombinant human GH more than one year were obtained from the LGS Database. The LGS has been progressing since 2012 and is an open-label, multicenter, prospective, and retrospective observational study. Results: Among 2,021 registered in LGS, the subjects were 366 except for the violation of selection criteria. Among them, IGHD was 252, 16 OGHD, 31 TS, and 67 SGA. The mean age of IGHD was 6.02, and the mean bone age was 4.49 years. OGHD was 7.38, 5.74, TS was 7.13, 6.52, and SGA was 5.61, 4.96 years. The height SDS according to chronologic age was -2.76 in IGHD group, OGHD -2.33, TS -2.9, SGA -2.57. In the IGHD and SGA group, IGF-I level has a positive correlation with weight and BMI (weight; r=0.0071 in IGHD, r=0.0009 in SGA, BMI; r=0.0411 in IGHD, r=0.003 in SGA). IGF-I showed a negative correlation with chronological age in the IGHD group (r=0.0411) and mid-parental height in the SGA group (r=0.0069). There was no significant relationship between pretreatment IGF-I level and growth response. However, in the IGHD group, the growth response was significantly higher when the change in IGF-I SDS value was 1 or more (P=0.0013). Conclusion: This study is the first study using LGS data to identify factors affecting IGF-I levels in Korean children with short stature and the relationship with treatment response. IGF-I levels were positively correlated with body weight in IGHD and SGA groups. There was no significant relationship between pre-treatment IGF-I levels and post-treatment growth response. In conclusion, IGF-I concentrations should be used as a tool for treatment compliance rather than for efficacy determination.

Tumor Biology

ENDOCRINE NEOPLASIA CASE REPORTS II

A Wolf in Sheep's Clothing: Intermittent Hypercalcemia from an Intrathyroidal Parathyroid Carcinoma

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MON-925

Parathyroid carcinomas have an estimated prevalence of <0.1% of all cancers and is found in <1% of patients with primary hyperparathyroidism (PHPT). While they frequently present with PTH- mediated hypercalcemia, they are often distinguished by severe hypercalcemia and markedly elevated PTH levels compared to their benign counterparts. Parathyroid cancers most often arise from existing parathyroid glands, making them identifiable with standard imaging modalities such as parathyroid sestamibi scan, thyroid ultrasound, and 4-D CT scan. There are reports of non-functioning parathyroid carcinomas, including those that are intrathyroidal. Most of the reported cases are found *de novo*. We present a case of an intrathyroidal parathyroid carcinoma with intermittent hypercalcemia. A 72-year-old man with a history of Graves' disease and RAI ablation in the 1970's was found to have hypercalcemia up to 14.1 mg/dL (8.5 - 10.1) with a PTH level of 223 pg/mL (14 - 64). He denied any constipation, bone pain, fractures, renal stones, or changes in mental status. Thyroid ultrasound demonstrated a 3.9 cm R lobe complex nodule reported as TI-RADS 4, and a hypoechoic 1.0 cm nodule in the L lobe. No definitive parathyroid adenoma was reported. A parathyroid sestamibi scan showed persistent uptake in area of the L 1.0 cm nodule favoring a PTH adenoma while the R nodule had initial radiotracer uptake with delayed washout but no technetium uptake. Laboratory evaluation demonstrated a 24-hour urinary calcium of 338 mg/24hr, low 25-OH vitamin D, and normal vitamin D 1,25 levels. Osteoporosis was diagnosed by BMD with T-score of -3.2 at the femoral neck. Repeat serum corrected calcium level was 9.7 mg/dL and PTH was 93 pg/mL. FNA cytology of the R thyroid mass was reported as benign thyroid tissue. Due to size of the R thyroid nodule, the patient underwent a R hemithyroidectomy with L parathyroidectomy. Intraoperative PTH levels decreased from 154 to 120 pg/mL after removal of L parathyroid adenoma; PTH level decreased further to 12.9 pg/mL after R hemithyroidectomy. Surgical pathology revealed 4.5 cm R parathyroid carcinoma without thyroid tissue with positive margins, and a hypercellular L parathyroid gland. PHPT resolved. After review of all aspects of the case and discussion with patient, the decision was made to monitor his calcium and PTH levels and repeat BMD 1 year from resection. This is an uncommon presentation of a rare endocrine malignancy. To our knowledge, there are few case reports of non-functional parathyroid carcinomas that were initially reported as thyroid cancer or benign thyroid tissue after biopsy. This report underscores the importance in keeping this rare diagnosis in the evaluation of PTH-mediated hypercalcemia.

Neuroendocrinology and Pituitary

RESEARCH ADVANCES IN PITUITARY TUMORS

Serotonin Regulates Corticotroph Tumor Cell Proliferation and ACTH Secretion

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OR06-03

Serotonin (5-HT) is an important hormonal modulator and neurotransmitter, and 5-HT has been demonstrated in