Growth Hormone Insensitivity; Laron Syndrome

Büyüme Hormonu Duyarsızlığı; Laron Sendromu

İhsan ESEN, MD,[a]
Fatma DEMİREL, MD[a]

[a]Department of Pediatric Endocrinology, Dışkapı Pediatric Diseases Training and Research Hospital, Ankara

Geliş Tarihi/*Received:* 09.11.2009
Kabul Tarihi/*Accepted:* 04.08.2010

Yazışma Adresi/*Correspondence:*
İhsan ESEN, MD
Dışkapı Pediatric Diseases Training and Research Hospital, Department of Pediatric Endocrinology, Ankara, TÜRKİYE/TURKEY
esen_ihsan@yahoo.com

Key Words: *Laron syndrome; child; growth hormone*

Anahtar Kelimeler: *Laron sendromu; çocuk; büyüme hormonu*

doi:10.5336/medsci.2011-24265

Short stature is one of the most common reasons of admissions to pediatric endocrinology departments. Laron syndrome is a very rare familial disorder with both autosomal recessive and autosomal dominant forms of inheritance. After definition of this genetic form of dwarfism by Zvi Laron and his colleagues in 1966, approximately 250 patients were identified worldwide.[1,2] Laron syndrome is characterized by marked short stature that results from lack of responsiveness to growth hormone (GH). GH levels are normal or increased. At the same time generation of insulin-like growth factor I fails because of GH receptor defects, abnormalities of GH signal transduction or primary defects of insulin-like growth factor I synthesis or secretion.[3]

Cases of growth hormone insensitivity (GHI) and growth hormone deficiency share a common phenotype. Birth weights of patients are usually normal or near normal but birth length may be slightly decreased. The patients can present with hypoglycemia or prolonged jaundice in neonatal period. Postnatal growth is strikingly influenced and patients ordinarily apply due to severe growth failure. Craniofacial features of patients are prominent forehead, frontal bossing, craniofacial disproportion due to small facies, hypoplastic nasal bridge, and blue sclera. High-pitched voice is remarkable. Skeletal age is delayed but may be advanced relative to height age. Micropenis is another clinical finding of patients in childhood. Even with normal gonadotropin production, puberty is generally delayed for 3 to 7 years.[3]

The combination of decreased serum concentrations of IGF-1 and IGFBP-3 plus increased serum concentrations of GH is highly suggestive of growth hormone insensitivity. These findings must be combined with inadequate response of increasing serum IGF-1 at least 15 ng/mL and IGFBP-3 concentrations at least 400 ng/mL to exogenous growth hormone. A scoring system was proposed for evaluation of short children for growth hormone insensitivity.[3,4]

Patients could not benefit from GH therapy because of IGF-1 generation failure. Production of IGF peptides by recombinant DNA technology gives a chance to patients with growth hormone insensitivity. Studies of IGF-1 treatment of GHI have indicated a persistent effect on growth rate, although height velocity remained slightly below which was achieved in the first and second years of treatment, in the subsequent years.[5]

We reported a case of growth hormone insensitivity (Laron syndrome) with characteristic clinic features and laboratory findings. This rare disorder must be considered especially if the patients have severe short stature.

REFERENCES

1. Laron Z, Pertzelan A, Mannheimer S. Genetic pituitary dwarfism with high serum concentation of growth hormone--a new inborn error of metabolism? Isr J Med Sci 1966;2(2):152-5.
2. Fang P, Girgis R, Little BM, Pratt KL, Guevara-Aguirre J, Hwa V, et al. Growth hormone (GH) insensitivity and insulin-like growth factor-I deficiency in Inuit subjects and an Ecuadorian cohort: functional studies of two codon 180 GH receptor gene mutations. J Clin Endocrinol Metab 2008;93(3):1030-7.
3. Rosenfeld RG, Cohen P. Disorders of growth hormone/insulin-like growth factor secretion and action. In: Sperling MA, ed. Pediatric Endocrinology. 3rd ed. Philadelphia: Saunders; 2008. p.254-334.
4. Blum WF, Ranke MB, Savage MO, Hall K. Insulin-like growth factors and their binding proteins in patients with growth hormone receptor deficiency: suggestions for new diagnostic criteria. The Kabi Pharmacia Study Group on Insulin-like Growth Factor I Treatment in Growth Hormone Insensitivity Syndromes. Acta Paediatr Suppl 1992;383: 125-6.
5. Backeljauw PF, Underwood LE; GHIS Collaborative Group. Growth hormone insensitivity syndrome. Therapy for 6.5-7.5 years with recombinant insulin-like growth factor I in children with growth hormone insensitivity syndrome: a clinical research center study. J Clin Endocrinol Metab 2001;86(4):1504-10.