Diagnostic value of random serum growth hormone, IGF-I and IGFBP-3 concentrations for the diagnosis of growth hormone deficiency in patients below one year of life.

MG. Ballerini, D. Braslavsky, A. Freire, A. Keselman, ME. Rodriguez, M. Altube, PA. Scaglia, I. Bergadá, MG. Ropelato
Centro de Investigaciones Endocrinológicas “Dr. César Bergadá” (CEDI) CONICET – FEI – División de Endocrinología
Hospital de Niños Dr. Ricardo Gutiérrez - Buenos Aires - Argentina

Introduction

The diagnosis of Growth Hormone Deficiency (GHD) needs to combine clinical phenotype, imaging as well as biochemical assessment of GH-IGF-I axis. The typical auxologic phenotype in neonates and early infants can be absent and therefore, a practical evidence-based approach to assess the usefulness of biomarkers of GH action is needed.

To our knowledge, this study is still lacking for current standardized GH, IGF-I and IGFBP-3 in patients below one year of life.

Objectives

1- To establish reference intervals for serum concentration of GH, IGF-I and IGFBP-3 for the whole first year of age.

2- To investigate GH, IGF-I and IGFBP-3 usefulness for GHD diagnosis in neonates and early infancy.

Patients

Cut-off criteria: Infants <1 year of age, who were referred to the Endocrinology Division with clinical suspicion of GHD from March 2016 to June 2019.

Clinical follow-up was the gold standard for GHD: diagnosis growth retardation, additional pituitary hormone deficiencies, brain MRI abnormalities and/or abnormal GH stimulation test during childhood.

Non-GHD: patients were diagnosed as having congenital hypothyroidism (CH) or transient hypoglycemia (TH).

Exclusion criteria: Premature babies, clinical sample under hypoglycemia.

Methods

Reference data on GH, IGF-I and IGFBP-3 obtained in a large cohort of healthy controls allowed us to calculate SDS for these biomarkers using current standardized assays.

GH constitutes the biomarker of choice in the diagnostic work-out of GHD in neonates.

In infants, the presence of GH and IGF-I or IGFBP-3 values below the cut-offs confirms GHD diagnosis with high specificity.

Due to the lack of an evidence-based approach for diagnosis of GHD along the first year of life with standardized immunoassays, we conclude that the cut-offs obtained in the present study could be useful in the diagnostic work-out of neonates and early infants with clinical suspicion of GH deficiency.