BIOTIN INTERFERENCE IN A PATIENT WITH CLINICALLY DISCORDANT HIGH THYROID HORMONES

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Introduction

Thyroid hormone resistance (beta) and TSHoma should be considered in patients with high free thyroxine (FT₄) and free triiodothyronine (FT₃) with unsuppressed thyroid stimulating hormone (TSH) levels. The aim of this study is to present the results of etiological research in a patient with Down syndrome who was clinically euthyroid but had high FT₄, high FT₃ and normal TSH levels.

Case

• A 28-day-old male with Down’s syndrome was referred because of increased FT₄ levels in his examinations.

Medical history:
• The patient was born at term with a weight of 3270 g, was operated by a pediatric surgeon for hirschsprung disease and he was using biotin at a dose of 10 mg/day due to biotinidase deficiency

Family history:
• Parents had no known thyroid dysfunction

Physical Examination:
• Weight: 4020 g (-0.68 SDS), Pulse: 130/dk,
• Height: 52 cm (-0.55 SDS), Blood pressure 90/50 mmHg
• Head circumference: 38 cm (0.07 SDS),
• Anterior fontanel: 1.5x1 cm
• No goiter; no findings for thyrotoxicosis
• Down syndrome stigmatism

Results

• As the patient was clinically euthyroid and had a history of biotin use, the method used for TFT was questioned considering biotin interference.
• The patient’s FT3 and FT4 tests were determined to be performed in an immunoassay system (Dxl, Beckman Coulter Inc., USA) using streptavidin-biotin and cause interference accordingly.
• There was no interference in the same tests on a different immunassay platform (Architect 2000, Abbott Lab., USA) which did not use this pairing methodically.
• FT₄: 3.64 pg/ml (1.5-6.4) sT₄: 1.17 ng/ml (0.48-2.34) TSH:2.53 mIU/ml (0.62-8) determined as normal.

Laboratory

• FT₄: 14.9 ng/dl (2.5-4.4) TSH: 2.65 mIU/L (0.34-5.6)
• FT₃: 4.08 ng/dl (0.54-1.24)
• Reexamination after one week in the same laboratory;
  • FT₄: 14.3 ng/dl (2.5-4.4) TSH: 2.88 mIU/L (0.34-5.6)
  • FT₃: 3.69 ng/dl (0.54-1.24)

In conclusion;

• This case report emphasizes that biotin interference should be kept in mind in patients with clinically discordant thyroid dysfunction, and the results of hormone measurements using biotin binding methods in patients using biotin may have clinically discordant abnormal results.