55th Annual ESPE Meeting
ESPE 2016 10-12 SEPTEMBER PARIS, FRANCE

AUTHORS HAVE NOTHING TO DISCLOSE

Poster number: P1-487
Topic: FAT METABOLISM & OBESITY
1st Author: Patrizia BRUZZI

UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Hypercholesterolemia in childhood: how the response to diet could lead to diagnosis. Lesson from a case-report.

P. Bruzzi [1], B. Predieri [1], S. F. Madeo [1], C. Rabacchi [2], P. Tarugi [3], S. Calandra [2], L. Iughetti [1]

[1] Department of Medical and Surgical Sciences of the Mothers, Children and Adults, Paediatric Unit; [2] Department of Biomedical, Metabolic and Neural Sciences; [3] Department of Life Sciences - University of Modena and Reggio Emilia, Modena, Italy

Introduction

Usually monogenetic primary hypercholesterolemia poorly responds to lipid-lowering diet and pharmacological therapy is recommended also in childhood to limit the progression of cardiovascular damage. Nevertheless, in a rare genetic condition, the normalization of lipid profile on diet is pathognomonic and it has to be considered falsely reassuring.

Case Presentation

First Referral

A Caucasian 7.86 years old boy with an incidental finding of hypercholesterolemia:

- Total cholesterol 524 mg/dl (13.54 mmol/L)
- LDL-cholesterol 412 mg/dl (10.65 mmol/L)
- HDL-cholesterol 52 mg/dl (3.93 mmol/L)
- Triglycerides 55 mg/dl (0.62 mmol/L)
- ApolipoproteinA 104 mg/dl; ApoB100 253 mg/dl

Medical history: parents unrelated. Family history positive for obesity and hypertension. Only his father presented a mild hypercholesterolemia (total cholesterol 242 mg/dl).
Anthropometric parameters: H-SDS -2.02 (Figure 1); z-score BMI -1.40 SDS.
Medical examination: prepubertal. No xanthoma and/or xanthelasma, no arcus corneae and/or splenomegaly.

Investigations

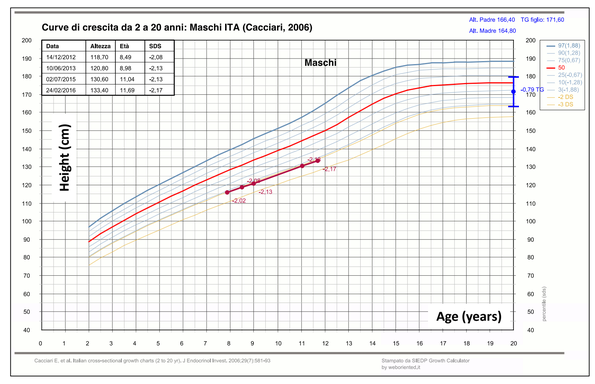
- Genetic analysis: **no mutations on ARH and LDL-R genes**
- Apolipoprotein E genotype: E3/E3
- Thyroid, liver and renal function: normal
- Echocardiography: no abnormalities

Initial Therapy

He was started on diet according to ***Therapeutic Lifestyle Changes*** **(from NCEP ATP III)**:

- total fat 25-30% of daily kcal/EER
- satured fat <7% daily kcal/EER
- cholesterol <200 mg/day

Figure 1. Height Growth Chart

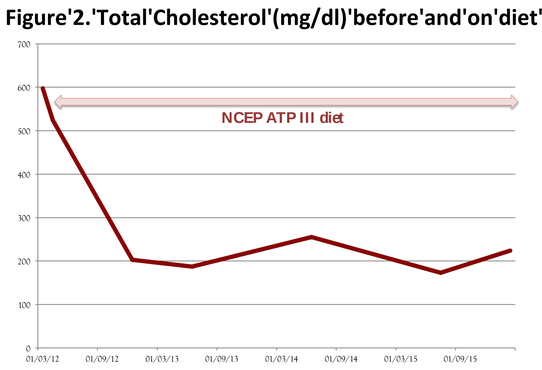


Sitosterolemia is a rare (80-100 cases/world) autosomal recessive disorder characterized by intestinal hyperabsorption and decreased biliary excretion of dietary plant sterol, due to mutations in adenosine-triphosphate(ATP)-binding-cassette(ABC) transporter family (ABCG8 and ABCG5) (Figure 4).

Follow-up

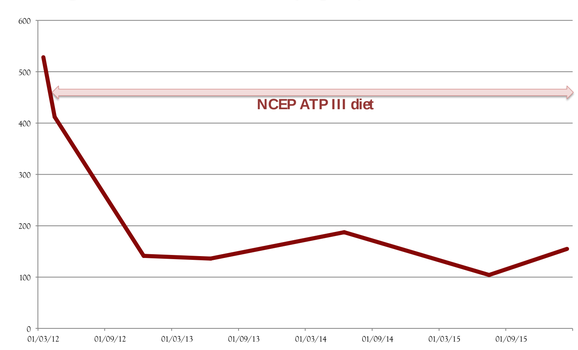
The relevant improvement in lipid profile within 6 months of cholesterol-lowering diet (Figures 2 and 3):

Figure'2.'Total'Cholesterol'(mg/dl)'before'and'on'diet'



- 39%

Figure'3.'LDL'Cholesterol'(mg/dl)'before'and'on'diet'



- 34%

Because of the impressive and rapid response to diet, ***sitosterolemia*** was suspected (Figure 4).
Blood plant sterol levels were: Betasitosterol 228, Campesterol 77.9 and desmosterol 2.13 mg/L (gas-liquid chromatography).

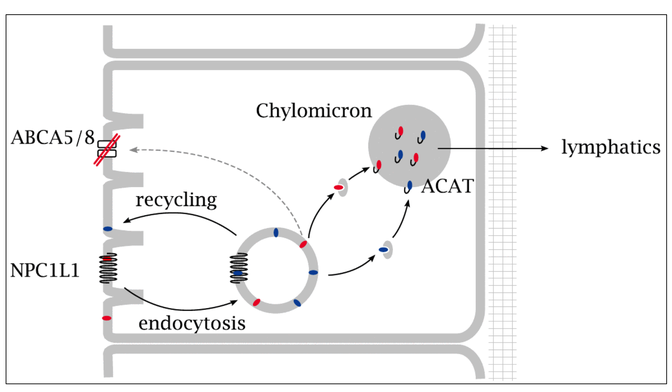


Figure 4. Phatogenesis: plant sterols that are taken up from the gut lumen can no longer be extruded, accumulate inside the mucosal cells, and ultimately find their way into the chylomicrons and the system.

- Genetic analysis confirmed the presence of **two non-sense mutation of ABCG8 gene (exon 3: c.320C>G, p.Ser107* and exon 7: c.1083 G>A, p.Trp361*)** configuring our patient as a compound heterozygous
- To date, he is still on NCEP ATP III diet but he also strictly reduces the intake of foods rich in plant sterols
- Vitamins supplementation has been started.

Conclusions

Sitosterolemia may apparently share clinical and biochemical features with homozygous familial hypercholesterolemia. Nevertheless, it is impressively responsive to cholesterol-lowering diet.
In our report, we demonstrate a rapid reduction of severe hypercholesterolemia in response to dietary restriction in a young patient leading to the diagnosis of this rare disease. Early identification and treatment may prevent premature atherosclerosis.

References: Lee MH et al. Curr Opin Lipidol 2001, 12(2): 141-149; Park JH et al. J Clin Endocrinol Metab 2014; 99(5):1512-1518; Salen G et al. Card Drug Rev 2002; 20(4): 255-270

DOI: 10.3252/pso.eu.55ESPE.2016
Poster presented at: ESPE 2016 PARIS
PosterSessionOnline.com