PSEUDOHOMOZYGOUS TYPE II HYPERLIPOPROTEINEMIA

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Summary  A 12-month-old boy with clinical findings suggestive of homozygous familial hypercholesterolemia, who had no secondary causes of hypercholesterolemia, and whose parents had no lipid abnormalities, was reported. No abnormalities were noted in the low density lipoprotein (LDL) receptor activities of the fibroblasts from patient, parents and sibling.

These features, combined with extreme responsiveness to available therapy, are strikingly suggestive of a new clinical hypercholesterolemic syndrome with manifestations resembling homozygous familial hypercholesterolemia.

INTRODUCTION

Familial hypercholesterolemia (familial type II hyperlipoproteinemia) is characterized by significantly elevated serum concentrations of cholesterol and LDL. It appears to be transmitted by a Mendelian dominant mode of inheritance and has high penetrance in early childhood (Fredrickson et al., 1978). The gene is expressed in both homozygotes and heterozygotes. There is considerable difference in the occurrence of clinical features and the serum lipid and lipoprotein levels between homozygotes and heterozygotes (Levy and Rifkind, 1973; Fredrickson et al., 1978).

The present paper is concerned with a peculiar case without potential secondary causes of hypercholesterolemia, which had clinical features and serum lipid and lipoprotein patterns suggestive of the homozygous type of familial hypercholesterolemia, although no abnormalities were found in the LDL receptor activities of the fibroblasts.

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CASE REPORT

A 12-month-old boy was admitted for evaluation of orange-yellow streaks over the dorsal surfaces of wrists and Achilles tendons. He was the second child of two from the same parents of non-consanguineous marriage (Fig. 1). He was born at term weighing 3,700 g after a normal delivery. Developmental milestones were normal.

At 11 months of age, he was first noted by his parents to have flat orange-yellow streaks over the dorsal surfaces of wrists and Achilles tendons. At 12 months of age, he was taken to dermatologists in our hospital, and then referred to our clinic for presumed diagnosis of hypercholesterolemic xanthomas.

On admission he was bright, well-developed boy without any complaints. Physical examination was completely normal except for xanthomas. Slightly elevated orange-yellow streaks lying superficially in the skin over the dorsal surfaces of wrists and Achilles tendons were easily seen. Serum lipid and lipoprotein determinations on admission revealed: total cholesterol 584 mg/dl, triglyceride 94 mg/dl, phospholipid 345 mg/dl, \( \beta \)-lipoprotein 1,577 mg/dl, LDL 1,341 mg/dl, LDL cholesterol 541 mg/dl, and high density lipoprotein (HDL) cholesterol 24 mg/dl. Serum lipoprotein electrophoresis in agarose gel showed a IIa pattern in the WHO classification (WHO memorandum, 1972). The following laboratory blood determinations were within normal limits: glucose, glucose tolerance test, blood nitrogen urea, electrolytes, GOT, GPT, alkaline phosphatase, bilirubin, protein electrophoresis, TSH, \( T_3 \), \( T_4 \). Urinalysis, roentgenograms of the chest, and ECG were also within normal limits.

A diagnosis of familial hypercholesterolemia in Japanese requires either (1) hypercholesterolemia greater than 250 mg/dl with tendon xanthomas or Achilles tendons of increased thickness, or (2) hypercholesterolemia greater than 250 mg/dl

![Fig. 1. Pedigree of patient's family. The proband is III-2. Serum total cholesterol, low density lipoprotein cholesterol, and triglycerides levels of the family members are given in Table 1.](image-url)