Unmasking of Childhood Hypothyroidism by Disseminated Xanthomas*

Jörg Dötsch, MD; Kristina Zepf, MD; Stefan Schellmoser, MD; Wolfgang Rascher, MD; and Helmuth G. Dörr, MD

ABSTRACT. Secondary hyperlipidemia is a common laboratory finding in children with nephrotic syndrome, diabetes mellitus, and hypothyroidism. However, clinical signs of hyperlipidemia are extremely rare in childhood.

We report on an 11-year-old girl who presented with a disseminated yellow papulomatous rash on the lower limbs and yellow skin creases on the palms of her hands. Blood tests yielded an opaque serum with a triglyceride concentration of 820 mg/dL and cholesterol of 1050 mg/dL. Skin biopsy of one of the papules confirmed the diagnosis of xanthomas.

Additional examinations revealed clinical (weight gain, diminished growth rate) and biochemical primary hypothyroidism (free T4: 0.4 ng/L [normal 8–22 ng/L]; thyroid-stimulating hormone: >200 mU/L) as a consequence of Hashimoto thyroiditis (thyroid peroxidase and thyroglobulin: 4400 U/mL and >2000 U/mL, respectively; normal <60 U/mL). The patient was started on L-thyroxine, which led to a gradual decline of cholesterol and triglycerides to normal concentrations and a complete remission from the xanthomatous rash.

For the first time, this case depicts disseminated xanthomas of the skin as the presenting complaint of severe hypothyroidism. *Pediatrics* 2001;108(5). URL: http://www.pediatrics.org/cgi/content/full/108/5/e96; *hyperlipidemia, hypothyroidism, xanthoma*.

ABBREVIATIONS. fT4, free T4; SDS, standard deviation score; TSH, thyroid-stimulating hormone.

With an incidence of 1 in 500, hyperlipidemia is one of the commonest congenital disorders of metabolism.[1] Heterozygous type III hyperlipoproteinemia is clinically relevant, as it is frequently associated with the presence of xanthomas in adulthood.[2] However, although nonspecific skin lesions may occur in childhood type III hyperbetalipoproteinemia, xanthomas are extremely uncommon.

Apart from inborn hyperlipidemia, secondary causes of elevated serum lipids have to be excluded. These diseases include the nephrotic syndrome,[3] diabetes mellitus, and hypothyroidism.[1] Particularly in childhood, however, secondary hyperlipidemia is rarely associated with clinical signs or symptoms.[4]

We present a child with disseminated xanthomas and massively elevated serum lipid concentrations as a consequence of severe hypothyroidism.

CASE REPORT

An 11-year-old girl presented to the pediatric endocrine outpatient department of the University of Erlangen with a disseminated yellow papulomatous rash on her lower limbs and yellow skin creases of the palms of her hands (Fig 1). The rash had been developing gradually over the past 2 years. On presentation, the patient was 137.5 cm tall (standard deviation score [SDS]: −2.4; Fig 2) and had a weight of 37 kg (50th percentile). Body mass index was 19.6 (SDS + 1.8 according to 5). When the patient was 4 years old, her height had been at the 50th percentile (102 cm;

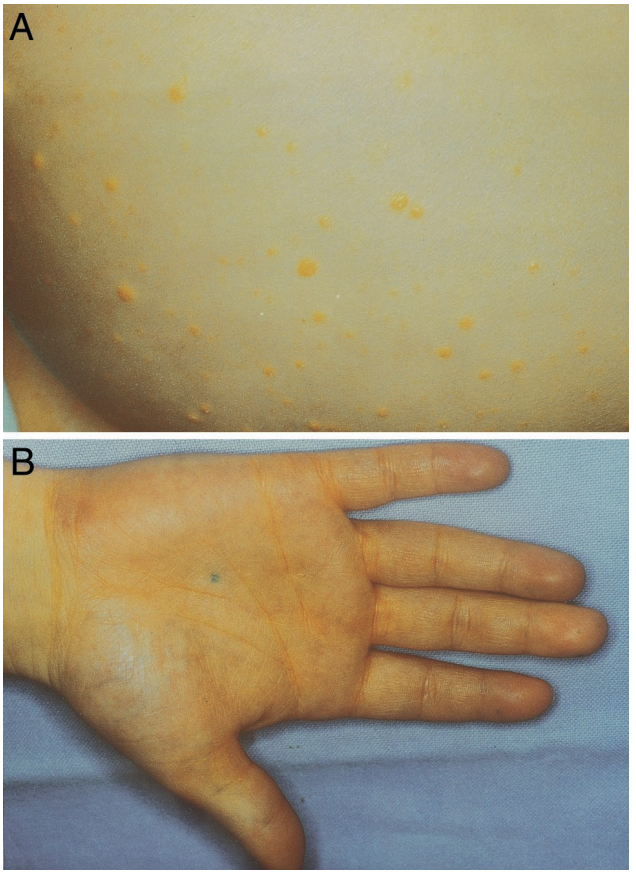

Fig 1. Abdominal wall (A) and palm of the hand (B) of an 11-year-old girl with hypothyroidism after Hashimoto thyroiditis and hyperbetalipoproteinemia. The diagnosis of xanthoma was confirmed by skin biopsy.

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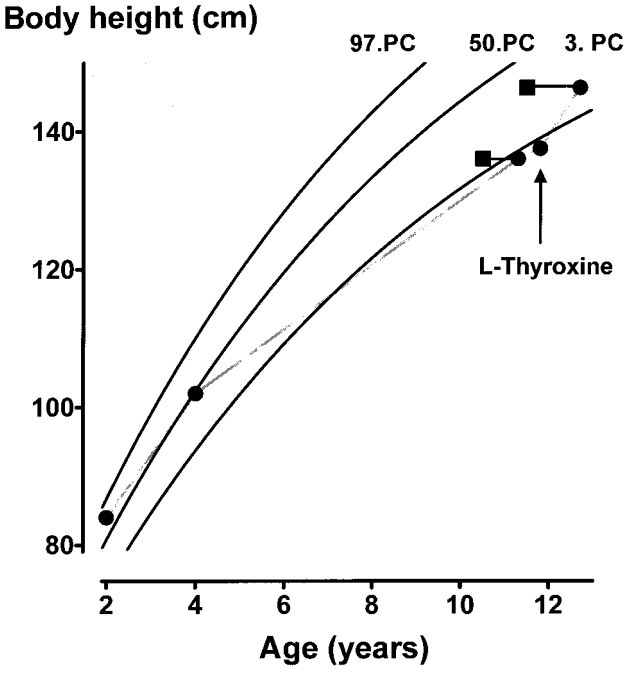

Fig 2. Growth curve of an 11-year-old girl with hypothyroidism after Hashimoto thyroiditis and hyperbetalipoproteinemia. Bone age is represented by squares. PC indicates percentile.

SDS: 0), decreasing to SDS −2.1 (136 cm) at age 10.25 years. The patient had dry skin and a resting heart rate of 52 beats per minute. Her blood pressure and physical examination were normal. She showed no signs of puberty.

Six months before, the patient was found to have slightly elevated serum concentrations of the hepatic enzymes aspartate aminotransferase (56 U/L; normal <22 U/L) and alanine aminotransferase (36 U/L; normal <21 U/L). There was no history of jaundice and no biochemical signs of cholestasis nor of an abnormal synthesis of hepatic proteins. Serologic tests for hepatitis B and C were normal. The girl did not complain of fatigue, deterioration of mental or physical function, constipation, or any other symptoms of hypothyroidsm.

The height of the parents (father 176 cm; mother 168 cm) resulted in a target height for the patient of the 50th percentile, according to German reference data.[6] There was no known family history of Hashimoto thyroiditis or other autoimmune disease nor of hyperlipidemia.

Blood tests revealed an opaque serum with triglycerides of 820 mg/dL and a cholesterol concentration of 1050 mg/dL. Because of the massive lipid elevation, lipoprotein electrophoresis was not possible. Skin biopsy of one of the papules confirmed the diagnosis of xanthomas of the skin. The second most striking finding was a primary hypothyroidism with a free serum T4 concentration of 0.4 ng/L [normal 8–22 ng/L] and a thyroid-stimulating hormone (TSH) concentration of >200 mU/L [normal <4 mU/L]. Antibodies against thyroid peroxidase and thyroglobulin were massively elevated (4400 U/mL (normal <60 U/mL) and >2000 U/mL [normal <60 U/mL], respectively). Ultrasound examination of the thyroid gland revealed a normal-sized (7 mL) thyroid gland with reduced and inhomogenous echogeneity, confirming the diagnosis of autoimmune thyroiditis.

The patient was started on 75 μg/d of L-thyroxine and later raised to 100 μg/d. After 3 months the patient was clinically euthyroid, had lost 2 kg of weight, but the xanthomas persisted. Thyroid function had normalized (fT4:12 ng/L, TSH: 2.0 mU/L) while moderate fasting hypertriglyceridemia (359 mg/dL; cholesterol 169 mg/dL) was still present.

However, after 1 year of treatment, serum triglycerides and cholesterol were almost normal (211 mg/dL, and 149 mg/dL, respectively). Free T4 was 12.2 ng/L, and TSH was 0.4 mU/L. The patient now had a growth velocity of 9.6 cm per year (97th percentile), and her weight was 35.9 kg (reduced by 1.9 kg in 1 year). The patient's prospective height had increased from 152 cm to 160 cm according to Bayley and Pinneau. The xanthomas had resolved completely (Fig 3).

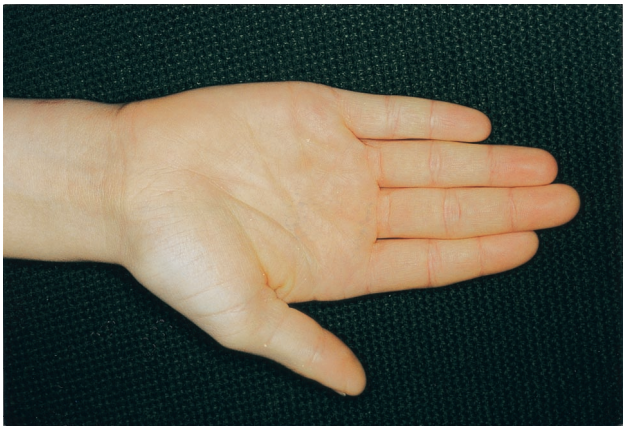

Fig 3. In our patient with hypothyroidism after Hashimoto thyroiditis and hyperbetalipoproteinemia, at the age of 13, the xanthomas on the palm of the hand (and on the trunk) had completely subsided.

In both parents fasting lipid concentration and thyroid function were normal.

DISCUSSION

This case illustrates that hypothyroidism in childhood may lead to severe hyperlipidemia with the subsequent emergence of xanthomas. Although hypothyroidism is generally regarded to be one potential cause of hyperlipidemia in childhood,[7,8] childhood hypothyroidism usually presents with different symptoms and signs, among which deterioration of mental or physical strength, obesity, and a drop in growth rate appear to be the most common.[9] Oligosymptomic presentation of hypothyroidism is rare in childhood but tends to become more common in the elderly patient. To our knowledge, xanthoma as the presenting complaint for hypothyroidism in children has not been reported. Even in adulthood, only 1 case of xanthoma tuberosum attributable to hypothyroidism has been published during the last 35 years.[10]

In adulthood, xanthomatous lesions are commonly found in hyperbetalipoproteinemia (type III, according to Fredericksen). However, even in children with severe hyperbetalipoproteinemia, typical lesions usually do not appear before adolescence.[3,11] The long period before the lesions occur highlights the rarity of the present case.

There is no indication of a coexisting congenital hyperlipidemia in our patient, as has been previously reported in other patients.[12]

CONCLUSION

Cutaneous xanthomas as a consequence of severe hyperlipidemia may be an extremely rare sign of childhood hypothyroidism.

REFERENCES

1. Koletzko B, Herzog M. Hyperlipidemia in children and adolescents: diagnosis and therapy. *Schweiz Med Wochenschr*. 1998;128:477–485
2. Yamamoto A, Kamiya T, Yamamura T, et al. Clinical features of familial hypercholesterolemia. *Arteriosclerosis*. 1989;9:I66–I74
3. Grundy SM, Vega GL. Rationale and management of hyperlipidemia of the nephrotic syndrome. *Am J Med*. 1989;87:3N–11N

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4. Stanley CA. Defects in metabolism of lipids. In: Behrman RE, Kliegman R, Jenson HB, eds. *Textbook of Pediatrics*. Philadelphia, PA: WB Saunders; 2000:377–405
5. Reinken L, van Oost G. Longitudinal physical development of healthy children 0 to 18 years of age. Body length/height, body weight and growth velocity. *Klin Padiatr*. 1992;204;129–133
6. Rolland-Cachera MF, Sempe M, Guilloud-Bataille M, Patois E, Pequignot-Guggenbuhl F, Fautrad V. Adiposity indices in children. *Am J Clin Nutr*. 1982;36:178–184
7. Lloyd JK. Plasma lipoprotein disorders in childhood. *Br J Hosp Med*. 1987;38:184–188
8. Lloyd JK. Hyperlipidaemia in children. *Br Heart J*. 1975;37:105–114
9. Dallas JS, Foley TP Jr. Hypothyroidism. In. Lifshitz F, ed. *Pediatric Endocrinology*. New York, NY: Marcel Dekker Inc; 1996:391–400
10. Lal S, Baruah MC, Rao KA, Veliath AJ. Xanthoma tuberosum due to hypothyroidism. *J Assoc Physicians India*. 1984;32:754–756
11. Neufeld EJ. Inherited dyslipidemias in childhood. *Curr Opin Pediatr*. 1993;5:707–711
12. Illingworth DR, McClung MR, Connor WE, Alaupovic P. Familial hypercholesterolaemia and primary hypothyroidism: coexistence of both disorders in a young woman with severe hypercholesterolaemia. *Clin Endocrinol (Oxf)*. 1981;14:145–152

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