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The Role of Atorvastatin in Management of Eruptive Xanthoma on a Boy: A Case Report

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Abstract

BACKGROUND: Eruptive xanthoma (EX) is a benign skin lesion caused by the accumulation of cholesterol and triglycerides in the skin's dermis. Xanthoma can be an early clinical manifestation of systemic diseases such as dyslipidemia, cardiovascular disease, and diabetes mellitus. The clinical presentation varies from asymptomatic skin lesions to intense pruritus and tenderness. This study aims that oral atorvastatin is effective in treating a child with EX.

CASE REPORT: A 3-year-old boy with an 8.4 kg body weight and 82.5 cm height came to the hospital with a chief complaint of small yellowish-white papules and nodes, discrete, 2–5 mm in size, painless on pressing, itchy, scattered, mainly in the lower extremity around the buttocks. On laboratory examination, Hb 11.5 g/dL, leukocyte 9900/ul, platelet 413,000/uL, and blood glucose 66 mg/dL. Further evaluation revealed total cholesterol 814 mg/dL, low-density lipoprotein (LDL) 970 mg/dL, high-density lipoprotein (HDL) 341 mg/dl, triglycerides 621 mg/dL; there is no evidence of familial hypercholesterolemia. The diagnosis is EX. After starting treatment with atorvastatin 0.2 mg/kg body weight/day in one dose for 6 months, his cutaneous lesions gradually subsided and significantly decreased cholesterol, LDL, HDL, and triglyceride levels.

CONCLUSION: Early therapy with atorvastatin will reduce the morbidity and mortality of EX.

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Introduction

Eruptive xanthoma (EX) is a benign skin lesion caused by the accumulation of cholesterol and triglycerides in the skin's dermis. Xanthoma can be an early clinical manifestation of systemic diseases such as dyslipidemia, cardiovascular disease, and diabetes mellitus. That is why early recognition and therapy of EX can reduce morbidity and mortality [1]. The prominent predilection for EX is in the extremities' extensor skin, back, and buttocks. This disease is characterized by a very high elevation of triglyceride levels. EX prevalence data are not available; however, in patients with severe hypertriglyceridemia, 10% were accompanied by EX [2]. This case report aims that oral atorvastatin is effective in treating a child with EX.

Case Report

A 3 years and 3-month-old boy with an 8.4 kg body weight and 82.5 cm height came to the hospital with a chief complaint of small yellowish-white bumps in the lower leg and around the buttocks, itchy. The patient has no fever, no cough. The patient lacks appetite but

often drinks formula milk, moderate malnutrition. In the family, no one has this kind of disease. On physical examination, the patient appears conscious, and vital signs are within the normal limits. Eye, ENT, and mouth had no abnormalities. Heart and lungs within the normal limits. Abdomen: there is no organomegaly. On the skin in the areas: dorsum manus, dorsum pedis, right knee, and left knee, left ankle, right ankle, right elbow, and left elbow, around the buttocks, appear multiple yellowish-white papules and nodes, discrete, 2–5 mm in size, painless on pressing, itchy.

On laboratory examination, Hb 11.5 g/dL, leukocyte 9900/ul, platelet 413000/uL, hematocrit 34%, differential count: basophil 0%, eosinophils 3%, stems 0%, segments 34%, lymphocytes 53%, monocytes 10%. ESR 1 h 33 mm, and ESR 2 h 52 mm. Blood glucose at 66 mg/dL (reference range ≤ 115 mg/dL), HbA1c 4.2% (reference range $< 7.5\%$). Total cholesterol – 814 mg/dL, low-density lipoprotein (LDL) – 970 mg/dL, high-density lipoprotein (HDL) – 341 mg/dl, and triglycerides 621 mg/dL. Total protein 6.9 g/dL (reference range 6–8.2 g/dL), albumin 3.0 g/dL (reference range 3.5–5.6 g/dL), and globulin 3.9 g/dL (reference range 1.3–2.9 g/dL). Urea nitrogen 31 mg/dL (reference range 15–50 mg/dL), creatinine 0.3 mg/dL (reference range ≤ 1.4 mg/dL), uric acid 3.6 mg/dL (reference range 3.4–7 mg/dL). Complete urine analysis was within the normal limits.

Furthermore, laboratory tests on the patient's father showed a triglyceride level of 83 mg/dL, LDL 137.1 mg/dL, and HDL 51.7 mg/dL. The patient's mother's laboratory results showed levels of triglycerides 87 mg/dL, LDL 112 mg/dL, and HDL 41.2 mg/dL.



Figure 1: Before treatment of eruptive xanthoma at the knee area

The diagnosis is EX. The therapy was atorvastatin 2 mg × 4 mg oral. There was a better clinical change after 4–6 months of treatment (Figures 1 and 2) and a significant decrease in cholesterol, LDL, HDL, and triglyceride levels, as shown in Table 1.



Figure 2: After treatment of eruptive xanthoma at the knee area

Table 1: Blood chemistry parameters of eruptive xanthoma before and after treatment

Parameter	10-03-2020	13-07-2020	31-08-2020	Normal range
Total Cholesterol mg/dL	814	250	277	130-200
LDL g/dL	970	192	155	≤150
HDL mg/dL	341	66	105	35-55
Triglycerides mg/dL	621	93	151	<175

LDL: Low-density lipoprotein, HDL: High-density lipoprotein.

Discussion

Xanthoma patients can be divided into two types, namely [3]: (1). Xanthoma, whose lipid levels are normal, such as xanthoma disseminate (usually very benign), and eosinophilic granuloma syndrome (usually accompanied by chronic disease). (2). Xanthoma accompanied by an increase in lipid levels, such as xanthoma tuberosum (usually accompanied by cardiovascular problems) and EX (often occurs in people with diabetes mellitus). EX in children is a scarce case. Xanthoma can precede clinical symptoms of diabetes mellitus, so we must be vigilant and explore diabetes mellitus [4]. There are several cases of EX accompanied by nephrotic syndrome [5], pancreatitis, hypothyroidism [6]. EX's prominent characteristic appearance is yellowish-white papules, may be accompanied by itching, sizes are usually 1–4 mm, mainly seen on the lower extremities' skin in the extensor area such as the elbows, knees, ankles, buttocks [7]. In this case, there is no evidence of diabetes mellitus, which is characterized by normal glucose levels, negative urine glucose, and HbA1c levels that are still within normal limits. Urea and creatinine values are within the normal limits indicating that there is no impaired renal function.

In EX, there was an increase in cholesterol levels and high triglycerides. In this case, there is a very high increase in LDL, HDL, and triglycerides. In this case, there is no evidence of familial hypercholesterolemia due to the parent's cholesterol, LDL, HDL, triglyceride levels are within the normal limits. Xanthoma lesions occur due to the uptake and storage of cholesterol, triglycerides, and phospholipids by macrophages with the accumulation in the dermis.

In this case, if the WHO weight-for-height boys and the height-for-age boy's growth curve are used, the nutritional status of this child is classified as severe-wasted, stunted. However, this nutritional state is not associated with hypercholesterolemia and hypertriglyceridemia. Maria's research on children under 5 years of age showed that levels of LDL and HDL were lower ($p = 0.036$), and triglycerides were higher (not significant) in the group suffering from acute malnutrition than in the normal group of children [8].

Dyslipidemia in childhood will increase the risk of atherosclerosis and cardiovascular disease in adulthood. The American Academy of Pediatrics recommends that the target LDL level in children is ≤ 130 mg/dL [9]. The primary treatment, in this case, is a modification of the

daily diet with low in fat, low in carbohydrates, exercise, and atorvastatin [10]. The primary mechanism of action of statins is inhibition of the enzyme-3-hydroxy-methylglutaryl-coenzyme A reductase. This mechanism is a rate limiting step in the biosynthesis of cholesterol. Reduced intrahepatic cholesterol leads to decreased very LDL assembly [11], [12]. Statins have also been proposed to be beneficial to prevent the progression of atherosclerosis by their pleiotropic effect [13]. Statins do not impact growth or development [14]. In this case, oral atorvastatin was given 0.2 mg/kg body weight/day in one dose for 6 months. It is proven that after 4–6 months of treatment, the patient's clinical condition is getting better, and the itching is completely gone. It is marked by a significant reduction in cholesterol, LDL, HDL, and triglyceride levels. The 20 years' follow-up studies on the use of statins in pediatric dyslipidemia did not report significant adverse severe events [15].

Conclusion

EX marks the beginning of serious complications such as dyslipidemia, cardiovascular disease, and diabetes mellitus. Supposed EX is treated early, morbidity and mortality will be reduced.

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