Prophylactic Treatment of Hereditary Angioneurotic Edema with Anabolic Steroids

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This is a case report of a patient with hereditary angioneurotic edema. Anabolic steroid was confirmed to be effective for the prophylaxis of edema and for an increase in serum C1INH and C4 levels.

(Key Words: Hereditary Angioneurotic Edema, C1-inhibitor, Anabolic Steroid)

INTRODUCTION

Hereditary angioneurotic edema (HANE) is an autosomal dominant genetic disorder which was recognized a century ago (5). A defect of the inhibitor of the activated first component (CIINH) is believed to be the cause (2).

Affected persons show recurring episodes of localized edema in the face, larynx and extremities, as well as abdominal discomfort. When the upper respiratory tract is involved, the patient may die of asphyxiation as a result of laryngeal edema. Therefore, prophylaxis of the edematous attacks is important for the management of patients with HANE.

CASE REPORT

A 37 year old male was referred to the out-patient clinic, Department of Internal Medicine, Tokai University, on March 18, 1978 because of recurrent swelling in the face and extremities during the past seventeen years. He had a 69 year old mother and a nine year old son with the same clinical symptoms (Fig. 1). Physical and laboratory examinations revealed no abnormalities in the heart, liver and renal functions, except for the serum complement systems shown in Table 1.

Hereditary angioneurotic edema was diagnosed on the basis of characteristic clinical symptoms, low serum levels of the fourth component of complement (C4) and low Cl inhibitor (CIINH). Administration of oxymetholone (30mg/day) was initiated from December 23, 1978 and the edematous attacks disappeared. Dosage of oxymetholone was reduced to 15mg per day from February 17 because of abnormalities in liver function tests which might be a side effect of oxymetholone. However, he has had no attacks for the last seven months, his serum complement levels increased,
and his serum transaminase levels decreased to the normal ranges (Fig. 2).

![Pedigree](image)

**Table 1.** Initial laboratory findings of the proband

<table>
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<th>LABORATORY FINDINGS</th>
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<tr>
<td>CBC: RBC 483 × 10^6/mm³, Hgb 15.5 g/dl, Hct 46.5%, Platelets 25.2 × 10^4/mm³, WBC 11,000/mm³ (Stab 0%, Seg 57%, Lympho 39%, Mono 4%)</td>
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<td>BIOCHEMICAL TEST: T.P. 7.4 g/dl (Alb 57.0%, α1 4.7%, α2 9.2%, β1 14.6%, γ 15.1%) IgG 1376 mg/dl, IgA 259 mg/dl, IgM 155 mg/dl, GOT 27 IU/L, GPT 21 IU/L LDH 171 IU/L, CPK 71 IU/L, Alk Phos 17 IU/L, T. Bilirubin 0.4 mg/dl, T. Cholesterol 190 mg/dl, Triglyceride 115 mg/dl, FBS 87 mg/dl, Urea N 11 mg/dl, Creatinine 0.9 mg/dl, Uric Acid 4.2 mg/dl, Na 141 mEq/L, K 4.0 mEq/L, Cl 107 mEq/L, Ca 4.9 mEq/L, Inorg Phosphorus 3.8 mg/dl</td>
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<td>SEROLOGICAL TEST: VDRL (−), TPHA (−), RA (−), ANF (−), CRP (−), Microsome test (−), Thyroid test (−), Coombs test (−), HB Ag/Ab (−)/(−), CH50 21.9 U/ml, ClINH 2.4 mg/dl, C4 5.0 mg/dl, C5A 15.0 mg/dl, C3 78 mg/dl</td>
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<td>URINALYSIS: Protein (−), Glucose (−), Sed; RBC (−), WBC (−), Epithel (−)</td>
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**DISCUSSION**

Patients with HANE may suffer extensive subcutaneous edema after minor injuries. However, many attacks occur without provocation. Two genetic variants have been described: the classic variant shows low serum levels of ClINH, while the other variant indicates normal amounts of ClINH protein which is biologically inactive (6). A polypeptide with kininlike properties is reported to be generated from the mixture of Cl, C4, C2 and plasmin in sera obtained from patients with HANE (1). The requirement of plasmin explains the efficacy of epsilon aminocaproic acid and its analog, tranexamic acid, in the prevention of attacks of HANE (3). However, their usefulness is limited because of their side effects, such as thrombosis, phlebitis and myositis.
The efficacy of androgens in the treatment of HANE was first shown in 1960 by Spaulding (8), but virilization and hepatotoxicity have prevented their clinical use. In recent years, Danazol, an attenuated androgen, has been introduced as the most effective drug for prophylaxis of HANE with few side effects (4, 7). Oxymetholone, a derivative of androgen used in this study, also showed a prominent effect in preventing the attacks with increased serum levels of ClINH and C4. A decrease in the liver functions has been improved by reducing the dosage of this drug. It is suggested that oxymetholone, which is less expensive than an attenuated androgen, is efficient in the prevention of edematous attacks with relatively minor side effects in patients with HANE.

REFERENCES