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Case Report

Successful use of tranexamic acid in the management of child having hereditary angioedema – A case report

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ABSTRACT

Hereditary angioedema (HAE) is a rare disease characterized by recurrent non-pitting subcutaneous edema, involving skin and mucosa of the upper respiratory tract and intestine. Approximately half of the cases manifest clinically in childhood. Due to the rarity of the condition, general practitioners may not be aware of this condition and hence every angioedema attack is managed with systemic steroids. Confirmation of the diagnosis and counseling of the family is also required for education of caregivers and emergency assistance for avoidance of triggering factors (trauma, mental stress, and infection) and prompt control of edematous attacks. We present a case of an 11-year-old child having HAE with recurrent episodes of swelling of face with family history positive and low level of C1 esterase inhibitor, C4 which was managed with systemic use of tranexamic acid.

Keywords: C1 esterase inhibitor, Hereditary angioedema

INTRODUCTION

Angioedema is a transient, non-pitting, and episodic edema involving the deeper layer of the skin and submucosal tissue due to temporary increase in vascular permeability. The face and extremities are most common to involve.[1,2] Angioedema is categorized into two types, type I, allergic angioedema associated with urticaria due to the release of histamine from activated mast cells and type II, non-allergic angioedema without urticaria, due to absent or abnormal function of C1 esterase inhibitor which can be hereditary or acquired.[3,4]

The pattern of inheritance of hereditary angioedema (HAE) is an autosomal dominant.[5] It has been associated with recurrent episodes of painful, swollen, and warm skin lesions, but not associated with urticaria and itching only burning sensation is present. This is due to the absence or abnormal function of C1 esterase inhibitor. Individual episodes persist up to 48–72 h but may persist till 1 week.[2] It is correlated with stress or trauma, infection, and changes in temperature. The HAE can be suspected when there is a family history and equal frequency of facial and peripheral involvement in cutaneous attacks.[6] A functional assay for C1 esterase inhibitor level (type I, 85%) and C1 esterase inhibitor activity (type II, 15%) is to be used as a confirmatory method for HAE diagnosis.

CASE REPORT

An 11-year-old boy presented with swelling around his eyes and swollen lips lasting 6–8 h subsiding after taking intravenous injections of steroid given by a pediatrician for the past 3 years. The patient used to have about two to three episodes in a month for the 1st year. On examination, there was diffuse ill-defined, non-pitting edema present over periorbital region involving the forehead and both cheeks and face [Figure 1]. No lymphadenopathy was present. Family history of similar events occurs in his father and brother. The swelling was not associated with itching and denied association of episodes of swelling with any particular diet. There was a negative history of trauma or insect bite at that site. Baseline hemogram, urine, and stool culture did not reveal any abnormality. The patient, his father, and sibling were evaluated for HAE [Table 1]. Diminished C4 level, C3 level, and C1 esterase inhibitor highly suggestive of HAE in our patient. The patient was being treated with tapering doses of corticosteroids and antihistamines by the pediatrician. On referral to us and confirmation of diagnosis, we put the patient on capsule

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Danazol 100 mg twice daily with which episodes were under control but he developed deranged liver function tests in the form of raised alkaline phosphatase level. Hence, we discontinued Danazol and started tranexamic acid 250 mg twice daily. He showed excellent response and was free from any episode of angioedema for 1 year. After which we stopped the tranexamic acid and since then, the patient is in remission.

Table 1: Investigation.

Marker	Value
C1 esterase inhibitor	0.17 g/L (0.21–0.39)
C4 level	8.3 (10–14)
C2 level	1.3 (1.6–3.5)
C1q inhibitor	41% (>60%)
Bleeding time	1.45 s (2–9)
Clotting time	3.50 s (8–15)
ANA by IF	Negative

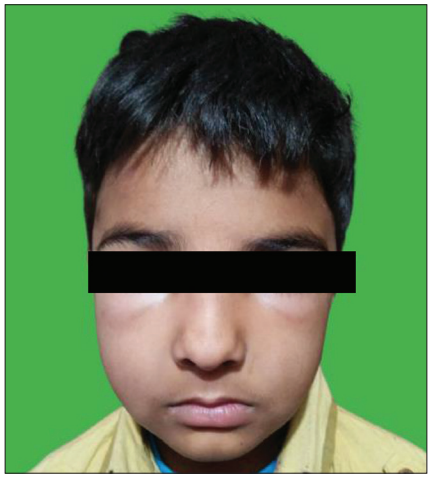

Figure 1: An 11-year-old boy with hereditary angioedema shows ill-defined swelling over B/L eyelid and lip.

DISCUSSION

HAE is an uncommon disorder clinically manifesting with as painless, non-itchy, and non-pitting swelling when it involves dermal or subcutaneous tissue and severe abdominal pain and acute respiratory obstruction when it involves of submucosal tissue along with C1 esterase inhibitor deficiency in some of the cases. Up to eight different forms of HAE have been described by recognized by the World Allergy Organization among which low plasma levels of a normal C1-INH protein are seen in type I HAE and in type II HAE by normal (or elevated) antigenic but low functional C1–INH levels. Recently identified type III HAE is an estrogen-dependent type of angioedema occurring in women with normal functional and quantitative levels of C1-INH.[7,8] The diagnostic algorithm is given [Figure 2].

Treatment of choice for control of the upper airway symptoms is human C1-INH concentrate (20–25 U/kg) or FFP (10 ml/kg). However, C1-INH concentrate is not easily available even at tertiary care institutes outlining the need for simpler and easily available therapies in the field. Tranexamic acid is a useful alternative for milder forms of HAE. It is given in the dose of 12–25 mg/kg. Prophylactic

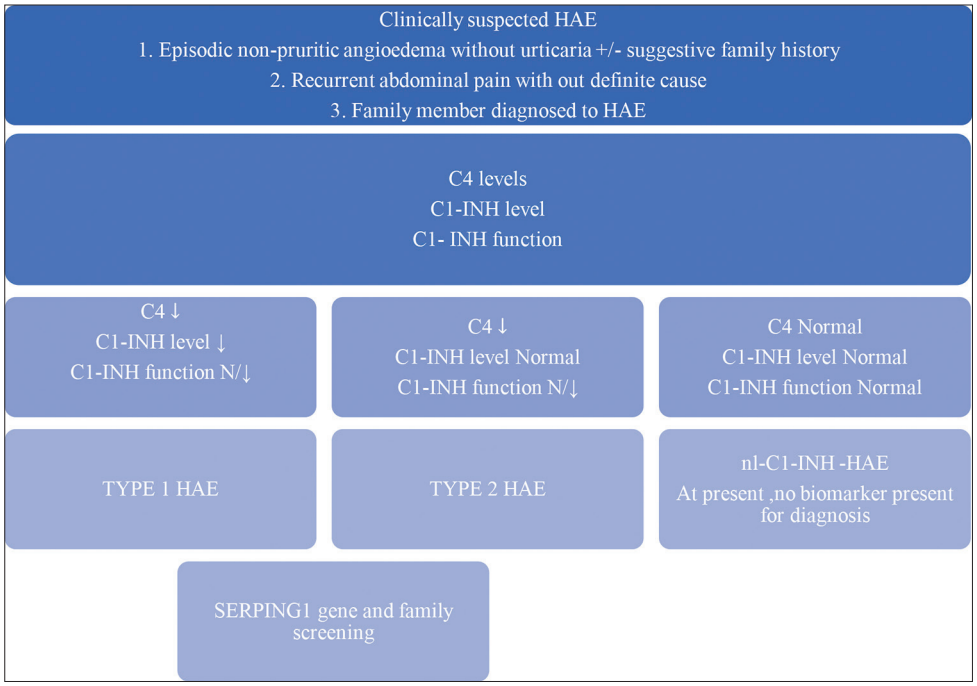

Figure 2: Diagnostic algorithm for patients with hereditary angioedema.

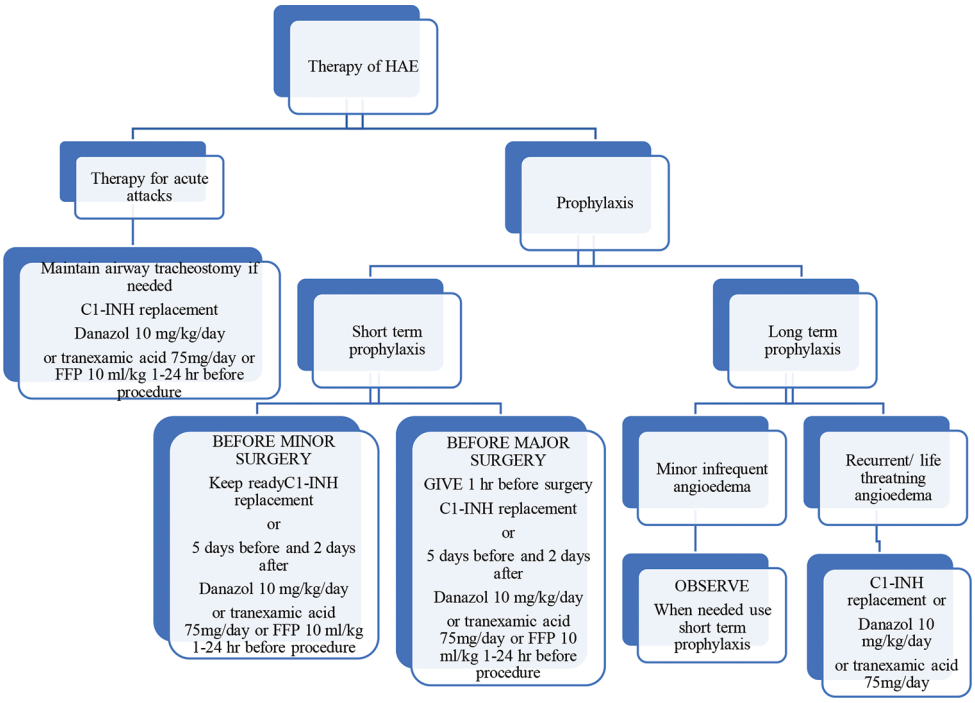

Figure 3: Therapeutic approach in hereditary angioedema.

use of the tranexamic acid in place of C1-INH concentrate or Danazol has also been described to be used in the same dosage for 5 days before and after surgery in patients with HAE. Maximum permissible dose is described at 1.5 g in the literature.[9] The therapeutic approach of HAE in children given [Figure 3]. Safety of plasma-derived C1 esterase inhibitor is better as compared to other prophylactic agents.[10]

CONCLUSION

HAE is often misdiagnosed or delayed diagnosis. All patients presenting with childhood onset of angioedema with positive family history should suspect HAE. The mainstay diagnostic test is to measure C-1 esterase inhibitor level and C4 levels. HAE is a curable disease with regular follow-up and support patients are able to lead a normal life. Tranexamic acid could be a safe and easily available medicine for the management of children with HAE.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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