NEURO

Openventio PUBLISHERS

ISSN 2377-1607 Open Journal http://dx.doi.org/10.17140/NOJ-1-105

Case Report

*Corresponding author
Surya N. Gupta, MD
Associate Professor
Pediatric Neurology
415 Morris Street, Suite 300
Charleston, WV 25301, USA
Tel. 304-388-6441
Fax: 304-388-6445
E-mail: suryangupta@rediffmail.com

Volume 1 : Issue 1
Article Ref. #: 1000NOJ1105

Article History
Received: October 1st, 2014
Accepted: October 30th, 2014
Published: November 6th, 2014

Citation
Gupta SN, Gupta VS. Angioedema caused by carbamazepine or acetazolamide: a single drug solution - an illustrative case report. *Neuro Open J.* 2014; 1(1): 20-22. doi: 10.17140/NOJ-1-105

Angioedema Caused by Carbamazepine or Acetazolamide: A Single Drug Solution - An illustrative Case Report

Surya N. Gupta[1*] and Vikash S. Gupta[2]

[1]Section of Child Neurology, Women's and Children's Hospital, Charleston Area Medical Center, Charleston, West Virginia, USA

[2]Medical student -IV, Texila American University, Woolford Ave, Georgetown, Guyana, USA

ABSTRACT

We report a rare case of angioedema in an adolescent female with multiple problems, seizures migraines, peudotumor cerebrii, supraventricular tachycardia, and obesity. Management of drug therapy in such patients presents a clinical challenge. We discuss a single drug solution particularly in those patients in whom the memory of side effects of the drug is a vivid reality.

KEYWORDS: Angioedema; Carbamazepine; Acetazolamide; Topiramate.

INTRODUCTION

Urticaria manifests as a skin eruption consisting of raised, intensely itchy papules or wheals which involves superficial dermis. In contrast, angioedema is a result deeper subcutaneous and submucosal tissue edema. Both are caused by post capillary venule inflammation resulting in fluid leakage. Clinical manifestations and etiology of acute onset angioedema are variable. Carbamazepine and acetazolamide like many other drugs may produce mild to severe adverse reactions.[1,2] Indeed angioedema is a rare complication of drug therapy in children.[3] The incidence peaks the third decade of life. Women are more often affected than men. Culprit drugs include analgesics, antibiotics, and contrast media. In the adult literature angiotensin-converting enzyme inhibitors are probably the best documented drugs that can induce angioedema.[4] However, there is a lack of published report of carbamazepine or acetazolamide-induced angioedema in children.[5]

By illustrating an acute onset angioedema, we discuss a single drug solution particularly in those patients in whom the memory of side effects of the drug is a vivid reality.

CASE REPORT

A 15 year-old female presented with an acute onset skin rashes, as well as painless lip, and eyelid swelling. She had no breathing difficulties. Her past history included supraventricular tachycardia, generalized epilepsy, an idiopathic increased intracranial pressure and disabling migraine attacks. The presenting symptoms occurred on the 26th day of starting carbamazepine (3.6 mg/kg/day) and acetazolamide. She has been receiving daily digoxin. She had no history of fever, systemic symptoms, and hereditary angioedema.

She was afebrile. Her vital signs were stable. Her body mass index was 52.4 Kg./m^2, over 95th percentile. Height and weight were 170 centimeters and 152 kilograms, respectively). Her facial appearance was notable for disproportionate swelling of the lips and eyelids and inflamed conjunctivae. Her extremities had non-pruritic maculopapular rashes. No skin and mucocutaneous ulcerations, or organomegaly were seen.

ISSN 2377-1607 Open Journal http://dx.doi.org/10.17140/NOJ-1-105

Differential white cell counts, eosinophil, serum biochemistry, and liver function tests, all were normal. Assessments of the complement system (CH50, C3 and C4), all were normal. Serum peak carbamazepine level was 6.5 (5.0-12 mcg./ml) and digoxin level was 0.5 (normal 0.9-12 ng./ml).

Clinical intervention and the course

She was hospitalized for angioedema management. Diphenhydramine was administered. Carbamazepine and acetazolamide, both were discontinued, while digoxin therapy was continued. On the second day, she had a transient and self-limiting clinical seizure. This was managed conservatively without re-starting anticonvulsant therapy. The patient made a slow but steady recovery and she was discharged on digoxin. Fourth day after hospital discharge, she had a major seizure. Then topiramate (2.8 mg/kg. body weight/day) was started. Over the next year, her debilitating migraines, seizures, intracranial pressure, all three were under controlled with the use of topiramate. She lost about twenty kilograms of body weight over twenty-four months of follow up.

DISCUSSION

Like our patient, angioedema with urticaria occurs in 40% of patients. The presented characteristics in the presence of normal laboratory testing and no family history support the diagnosis of angioedema with urticaria which is probably caused by carbamazepine or acetazolamide. Both drugs are known to induce angioedema. Because both drugs were initiated and discontinued simultaneously, it is debatable which drug was responsible for angioedema. We did not re-challenge with carbamazepine or acetazolamide which may have provided a clue. Acetazolamide is a sulfonamide derivative. Therefore cross sensitivity is possible.[6] On other hand, Duran-Ferreras et al, reported carbamazepine hypersensitivity affecting skin and kidney.[7] Laryngeal swelling is rare when angioedema is associated with urticarial rashes.[8]

Therapeutic challenge: A single-drug solution

Before instituting the drug, one should ascertain its benefits and risks, and should set a realistic expected goal of therapeutic intervention. In our case, a daily drug prophylaxis was indicated for two common neurological problems, recurrent seizures and debilitating migraines. Topiramate was chosen to prevent both due to; (1) being a broad acting anticonvulsant, (2) its role in prevention of migraine attacks, additionally for (3) weight reduction as its side effect and, most importantly, (4) Topiramate has not been reported to cause angioedema.[9]

It should be noted that if our patient did not have epilepsy, a daily drug therapy for migraines was still needed. In this context, replacing digoxin by beta-blocker (atenolol or propranolol) to treat both supraventricular tachycardia and migraines may have been an appropriate choice.

The timing

The timing of re-starting anticonvulsant may be debatable. This may raise an ethical concern because anticonvulsant therapy was withheld even after reoccurrence of the minor seizure. This was done because of following; (1) the patient was still recovering from angioedema, (2) to allow a washout period for carbamazepine and acetazolamide, (3) to assess the need for a long-term anticonvulsant preventive therapy. Such documentation is important because there is no guarantee that use of a new drug (topiramate) will not cause side effect. This will also aid in the reinforcement of compliance.

CONCLUSIONS

Many drugs including carbamazepine and acetazolamide may cause angioedema with or without urticaria. It is imperative to set a goal first before looking for the means. In the context of potential side effects the drug therapy should be carefully justified. While choosing a single drug therapy it worth considering if the selected drug's side effect can be utilized to prevent other symptoms like in our patient.

ACKNOWLEDGMENT

We thank Aziez Ahmed, MD for his critical review and suggestion.

DECLARATION OF CONFLICTING INTEREST

The authors have no conflicting interest, commercial, or other financial relationships related to this article.

REFERENCES

1. Syn WK, Naisbitt DJ, Holt AP, Pirmohamed M, Mutimer DJ. Carbamazepine-induced acute liver failure as part of DRESS syndrome. *Int J Pract*. 2005; 59: 988-991. doi: 10.1111/j.1368-5031.2005.00550.x

2. Kristinsson A. Fatal reaction to acetazolamide. *Br J Ophthalmol*. 1967; 51(5): 348-349.

3. Fischer M, Hamm H, Wirbelauer J. [Severe drug-related skin reaction: toxic epidermal necrolysis caused by carbamazepine] *Klin Padiatr*. 2004; 216(5): 288-293. doi: 10.1055/s-2004-44896

4. Cohen EG, Soliman AM. Changing trends in angioedema. *Ann Otol Rhinol Laryngol*. 2001; 110(8): 701-706.

ISSN 2377-1607 Open Journal http://dx.doi.org/10.17140/NOJ-1-105

5. Elias A, Madhusoodanan S, Pudukkadan D, Antony JT. Angioedema and maculopapular eruptions associated with carbamazepine administration. *CNS Spectr*. 2006; 11(5): 352-354.

6. Stock JG. Sulfonamide hypersensitivity and acetazolamide. *Arch Opthalmol*. 1990; 108: 634-635. doi: 10.1001/archopht.1990.01070070020005

7. Duran-Ferreras E, Mir-Mercader J, Morales-Martinez MD, Martinez-Parra C. Anticonvulsant hypersensitivity syndrome with severe repercussions in the skin and kidneys due to Carbamazepine. *Rev Neurol*. 2004; 38(12): 1136-1138.

8. Middleton E Jr, Reed CE, Ellis EF. Allergy: Principles and practice. 6th Eds. St Louis, MO, USA: *Mosby-Year Book Inc*; 2002; 2: 1537-558.

9. Bourgeois BF. Drug interaction profile of topiramate. *Epilepsia*. 1996; 37Suppl(2): S14-S17.