



Role of Zinc Supplementation in the Treatment of Levetiracetam-Induced Hair Loss: A Case Series

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ABSTRACT

Cosmetic side effects are among important causes for non-compliance in patients on anti-epileptics. Telogen effluvium (TE) is one of the most encountered cosmetic adverse effects. This report presents three patients with seizure disorder who developed levetiracetam-induced TE. Levetiracetam was considered to be a proper option for the treatment of the presented cases and therefore was not changed to other anti-epileptics. To manage TE, it was decided to add zinc sulfate to the therapeutic levetiracetam regimen. All three patients reported improvement in their hair condition as well as in controlling their seizure. Levetiracetam has favorable safety and efficacy profiles. However; the hair loss caused by this medication is a major drawback. Zinc sulfate was decided to be added to the therapeutic levetiracetam regimen in order to manage TE. All three patients reported improvement in their hair condition. Zinc supplementation is suggested to be safe and cost effective when considering management of levetiracetam-induced TE.

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Introduction

Levetiracetam is an antiepileptic drug approved for myoclonic, tonic-clonic, and partial onset seizure. Anti-epileptic drugs are among known medications for their cosmetic side effects of which, hair loss is the second most encountered problem in both men and women. There are not many studies conducted about levetiracetam cosmetic side effects. However, hair loss is one of the most important adverse reactions in patients on levetiracetam treatment (1).

Telogen effluvium (TE) is a form of non-scarring alopecia which presents as a diffuse hair loss. There are some known causes for TE, such as hormonal changes,

stress and medications. This case study presents 3 patients who developed TE after consuming levetiracetam. The hair loss noted in these patients was successfully treated with zinc sulfate supplementation.

Case 1

Our first case is a 16-Year-old female who presented with falling attacks and jerky hand movements. Her EEG was abnormal compatible with myoclonic epilepsy syndrome and she was on topiramate 25 mg twice a day. Due to incomplete seizure control, lamotrigine was started for her and topiramate was tapered down. At the next follow up visits, she complained of experiencing generalized tonic-clonic seizures (GTCs) so levetiracetam 750mg daily was added.

Due to continuing GTC attacks lamotrigine was tapered down and discontinued as it was suspected to be the cause. After one year, while being on 1500 mg daily of

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levetiracetam, she complained of significant hair loss. Her hair loss had a diffuse pattern without any cicatricial lesion. After ruling out the common causes of hair loss, levetiracetam induced TE was proposed as the reason for her hair loss and zinc sulfate capsule 220 mg twice daily was started. Meanwhile, levetiracetam dose was increased to 1750 mg daily in this patient to achieve desirable seizure control. At the follow up visit, two months later, her hair condition had improved

Case 2

Our second case is a 10-year-old female diagnosed with typical absence seizure who had been treated with ethosuximide and valproic acid before being visited at our clinic. She had a history of Steven-Johnson syndrome with both drugs. Topiramate and even carbamazepine, phenytoin and phenobarbital had been tried for her in the past. Carbamazepine and phenytoin had caused severe allergic skin reaction and phenobarbital and topiramate had shown no efficacy.

She presented to our clinic taking topiramate 50mg BD with her absence attacks remaining uncontrolled. We started levetiracetam 125mg twice a day. Two months after the dose was increased to 1250mg a day, she started to experience profound hair loss. She was diagnosed with drug-induced TE as the other possible causes of hair loss were ruled out. Because of her history of drug reaction and that her attacks were only 50% controlled, levetiracetam was continued and zinc sulfate capsule 220 mg twice daily was added to her treatment. Two months later her hair loss improved.

Case 3

Our third case is a 32-year-old female who was diagnosed with myoclonic epilepsy. Initially, lamotrigine was administered in this patient; however, later it was switched to levetiracetam due to lamotrigine induced skin rash. Twelve months later, she returned to the clinic complaining of severe hair loss and informed the staff that she was pregnant. After a complete work up to determine possible causes of her hair loss, levetiracetam-induced TE was proposed to be responsible. Due to being pregnant at that time, her treatment plan was decided not to change; Meanwhile, zinc sulfate capsule 220 mg twice daily was started for her. Six months later, the hair loss had improved.

Discussion

Generally, drug-induced TE follows a similar pattern in most cases. It starts 2-4 months after administration of a specific medication and presents as a diffuse non-cicatricial loss of hair. The number of lost hair is often about less than 300 hairs per day (2-4). Other causes of

TE should be ruled out before determining a drug as the culprit agent. After establishing the diagnosis of drug-induced TE the simplest way to treat it is to switch to another medication as TE often resolves with the cessation of the causing agent (3, 4). However, if switching to another medication could not be achieved immediately, the clinician may lower the dose to minimum effective dose (3). These strategies, however, could not be used for all of the patients due to complexity of their condition or their past medication.

Calabrò et al., have reported an abnormal zinc level in a patient with levetiracetam-induced TE which was normalized after changing the drug to topiramate (5). One of the proposed mechanisms for levetiracetam seizure prevention is by antagonizing zinc function in GABA-ergic receptors (6). After considering the existing data and the role proposed for zinc depletion in hair loss (7, 8), the authors decided to try zinc sulfate supplementation in 3 of our patients who were on levetiracetam. As expected, zinc sulfate supplementation resulted in managing and improving levetiracetam induced hair loss.

Zou et al., have reported zinc supplementation to be effective for the treatment of levetiracetam induced TE in 5 patients (9). Except for the mentioned report, we could not find any other report regarding levetiracetam induced TE treatment with zinc supplementation in the literature.

Considering the psychological burden related to the hair loss and the fact that the culprit drug could not be withdrawn in some cases, it seems reasonable to conduct a clinical trial to determine whether or not zinc sulfate supplementation may play a role in the treatment of levetiracetam induced TE.

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