



## An unusual neurological complication of Desmopressin: A case report

**Reem Alyoubi**

Assistant Professor of Pediatric Neurology, Epilepsy and Clinical Neurophysiology, Division of Neurology, Department of Pediatric, King Abdulaziz University Hospital, Jeddah, Saudi Arabia; Email: raalyoubi@kau.edu.sa

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### General Note



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### ABSTRACT

Desmopressin is generally used to treat nocturnal enuresis but is not recommended for pediatric patients due to reports of seizures caused by an electrolyte imbalance. This case report is on a 10-year-old Yemeni male patient who suffered four seizures after using intranasal desmopressin for one month without proper supervision. Some studies have proven that the usage of intranasal desmopressin can have adverse effects. The major side effect concerning our case was the seizures, which were due to an electrolyte imbalance resulting in hyponatremia. As a result, patients must take precautions while on this medication. In conclusion, parents must be counseled about the side effects of intranasal desmopressin in order to help them make a well-informed decision when obtaining this medication. If they decide to use it, they should administer the doses under supervision.

**Keywords:** Desmopressin; seizures; pediatric patient; electrolyte imbalance; complication

## 1. INTRODUCTION

Desmopressin, taken intranasally or orally, has been used to treat nocturnal enuresis for years. However, the intranasal route is not recommended for children because of the potential seizures or attacks that follow as an adverse reaction to the medication (Whalen, 2015). Electrolyte imbalances, including sodium level disturbances, can be an uncommon result of the intranasal form of desmopressin (Aching et al., 2014). We presented a case of attacks in a healthy 10-year-old Yemeni male, which was caused due to the usage of intranasal desmopressin to treat nocturnal enuresis, albeit with ignorance on the part of the guardians and with no close follow-up.

## 2. CASE REPORT

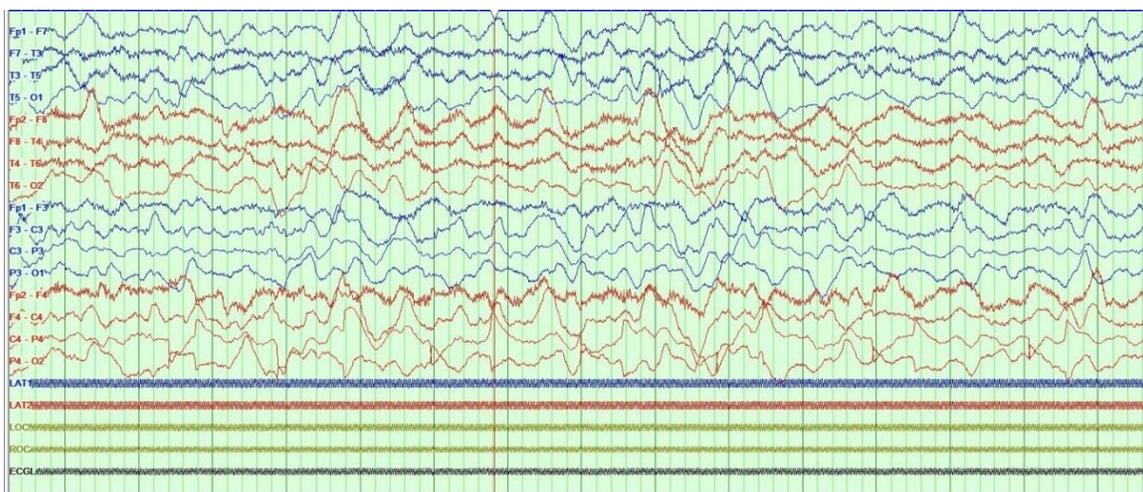
The healthy 10-year-old male patient, not known to have any prior medical illnesses, was brought to the ER after four tonic-clonic seizures characterized by generalized jerks in the upper and lower extremities. In the pre-ictal phase, there was no aura and the patient was asleep. During the ictal phase, the patient was unconscious between attacks—he had tonic-clonic jerks in his upper and lower extremities and even bit his tongue in the last episode. During the post-ictal phase, he had eye and neck pain, could not respond to others or speak, and after four days of hospitalization, returned to his normal behavior. Initially, his mother denied any drug ingestion but she later mentioned that the child had been on a desmopressin nasal spray for nocturnal enuresis that had been unsupervised for one month and had not had any medical follow up.

Patient hasn't been in recent stress, no history of head trauma, no developmental disorders, no recent vaccinations, and he was not known to have any chronic diseases, no fever. He has a previous history of febrile seizure at 18 months. On examination patient looked healthy and well, body built was underweight (BMI: 16.3) oriented to time, place, person, normal color, and no deformities, connected to IV line.

- Heart rate: 60 bmp (normal rate, rhythm)
- Respiratory rate: 23 bpm
- Blood pressure: 121/71 mmHg
- Temperature: 37.7 C (on day of ER it was 37 C)
- Height: 138 cm2 (50th percentile on growth chart)
- Weight: 31 kg (50th percentile on growth chart)

Normal neurological exam. GSC was 10/15 during presentation but improved to 15/15 after 4 days of hospital stay

- Other physical exam was unremarkable



**Figure 1** Electroencephalogram (EEG) showed mild encephalopathy.

During the 4 days the following investigations were done: -

CBC: normal

Creatinine: 1196 umol/L (53-115 umol/L)

Calcium: ↓ 2.07 mmol/L (2.12-2.52 mmol/L) Sodium: ↓ 122 mmol/L (136 – 145 mmol/L)

Glucose: 6.3 mmol/L (3.9 – 6.7 mmol/L)

Lumbar puncture:

Glucose CSF: Normal

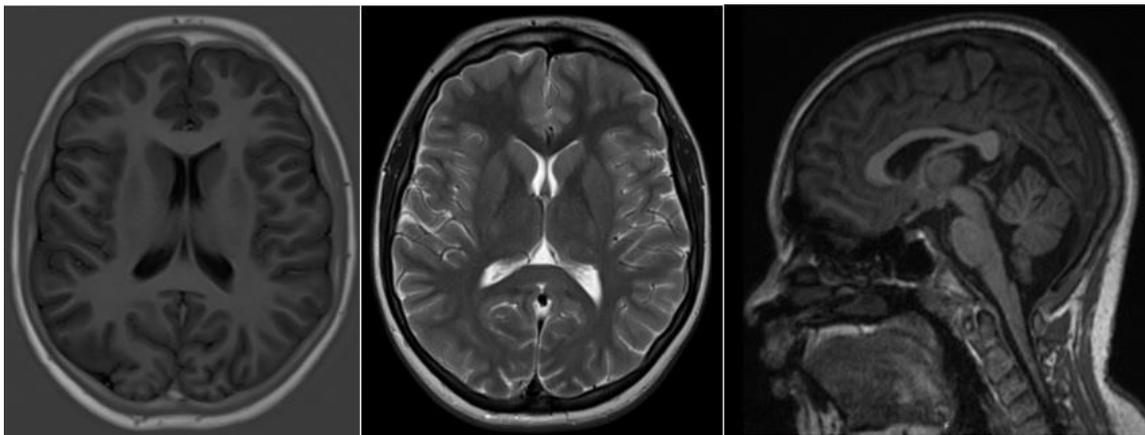
Bacterial and Fungal CSF: no organism isolated after 5 days of incubation

Cell count CSF: 0 WBCs/mm<sup>2</sup>

Urine analysis: no significant findings, Bacterial culture: no growth

Electroencephalogram (EEG) showed encephalopathy. (Figure 1)

Neuroimaging showed no acute intracranial pathologies (Figure 2)



**Figure 2** Magnetic resonance imaging (MRI) shows normal appearance and intensity of brain parenchyma.

### 3. DISCUSSION

Hyponatremia is a known complication of intranasal desmopressin (Whalen, 2015) and, thus, parents should be aware of this side effect. Lucchini et al. illustrated that in 22 out of 54 cases, excess fluid was ingested along with desmopressin, which enhanced the hyponatremia. Therefore, fluid intake should be limited from one hour up to eight hours after the administration of desmopressin. The prescription of desmopressin should also be discontinued during illnesses that may cause electrolyte imbalance, such as a fever, vomiting, or diarrhea. Parents should also be aware of the risks associated with increasing the dosage of medication or drinking excessive fluids, both of which can enhance the effects of hyponatremia, thus increasing the risk of a seizure (Lucchini et al., 2013). However, Robson et al. concluded that there is a decreased risk of developing hyponatremia through oral desmopressin as compared to nasal desmopressin (Robson et al., 2007). This can be due to the increased absorption of the intranasal formulation as compared to the oral formulation or due to the increased risk of uncertainty regarding adequate dose administration. Additionally, parents in Saudi Arabia must be aware that the intranasal formulation is no longer available for the treatment of enuresis in Canada, USA, and most European countries (Lucchini et al., 2013).

### 4. CONCLUSION

It is evident that hyponatremia can cause seizures in children in the case of intranasal desmopressin. Therefore, parents must be counseled about the side effects of intranasal desmopressin to help them make a well-informed decision when obtaining this medication. Furthermore, if parents agree to administer desmopressin nasal spray to their children, they should also be aware of the precautions taken to avoid hyponatremia, including controlling fluid intake, monitoring proper dosage, and discontinuing medication when appropriate. Future research into this phenomenon could prove whether intranasal desmopressin affects all children around this age or whether it is a rare complication due to genetic or environmental factors.

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**Conflict of Interest**

The author declares that there are no conflicts of interests

**Informed Consent**

Written and oral informed consent was obtained from the patient in this study.

**Data and materials availability**

All data associated with this study are present in the paper.

**Peer-review**

External peer-review was done through double-blind method.

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