Brief Communications

Case Report: Shortest Course of Pediatric Paroxysmal Hemicrania

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Paroxysmal hemicrania (PH) is a rare primary headache disorder, especially among children. We describe herein a case with the shortest course of pediatric PH among previously reported cases, and the first case report of Japanese pediatric PH. An 11-year-old boy was referred to our clinic by his primary care physician for a headache evaluation. He had been complaining of severe, sharp, pulsating headache for 5 days. Attacks were restricted to the left side with a duration ranging from 2 to 20 minutes, 20-30 times a day. Attacks were associated with left autonomic symptoms (conjunctival injection, lacrimation, nasal congestion, eyelid edema, and ptosis). Two days after we prescribed indomethacin at 0.9 mg/kg/day, the patient was headache free. He stopped taking indomethacin 14 days after consultation because of drug eruptions. As of the time of writing, more than 1 year later, he has experienced no recurrence of headache. This case indicates the importance of improving awareness among general doctors regarding PH in children, and of conducting further investigations about low-dose, short-term indomethacin treatment.

Key words: child, pediatric, paroxysmal hemicrania, Japanese, short course

Abbreviations: CPH chronic paroxysmal hemicrania, EPH episodic paroxysmal hemicrania, NRS Numerical Rating Scale, PH paroxysmal hemicrania

INTRODUCTION

Paroxysmal hemicrania (PH) is a rare cause of headache, especially among children.\(^1\) PH is characterized by more than 20 attacks of severe, unilateral, orbital, supraorbital, and/or temporal pain lasting 2-30 minutes. Attacks occur in association with a sense of restlessness or agitation and/or ipsilateral cranial autonomic dysfunction, such as conjunctival injection, lacrimation, nasal congestion, rhinorrhea, eyelid edema, facial sweating, miosis, and ptosis.\(^2\) Very few case reports have described pediatric PH. We provide herein a description of the shortest course of pediatric PH,
and the first description of pediatric PH from Japan. The appropriate dose and duration of indomethacin therapy for pediatric PH remain unclear.

**CASE REPORT**
An 11-year-old boy was referred to our clinic by his primary care physician for evaluation of headache. His medical history included asthma treated by olopatadine, pranlukast, carbocysteine, and inhaled salmeterol xinafate/fluticasone propionate. He underwent no asthma attacks and no medication dosing adjustment. He had normal birth/developmental history. His family had no remarkable medical history including headaches and dysautonomia. He had been complaining of severe, sharp, pulsating headache for 5 days. No precipitating factor was detected such as head trauma, illness, asthma attack, and so on. These painful attacks were strictly left-sided, located in the orbitofrontal and temporal regions, without any side shift. Pain was severe, at 8 on the Numerical Rating Scale (NRS), and lasting 2-20 minutes. Frequency of pain attacks was 20-30 times/day, more than 20 times during the daytime and 2-5 times at night. These attacks had a sudden onset with a clear end, and were associated with left unilateral autonomic symptoms (conjunctival injection, lacrimation, nasal congestion, eyelid edema, and ptosis), with neither facial sweating nor miosis (Fig. 1a). He showed an improvement of conjunctival injection and lacrimation during interictal attacks but not disappeared, while the other cranial autonomic symptoms were persisted. No photophobia, phonophobia, allodynia, fatigue, nausea, vomiting, restlessness, or aggressive behaviors were present. The attacks occurred spontaneously without prodromal symptoms or any triggers such as innocuous stimulation or exercise. During the interictal period, he felt no pain and was able to play soccer. Since the first attack, his primary care physician had tried acetaminophen and inhalation of 100% oxygen, but these treatments had no effect.

The patient underwent neurological examination, MRI/MRA/MRV of the head, and blood examinations, all yielding normal results. The blood examinations included biochemical, complete blood count, THS/FT3/FT4, rheumatoid factor, ss-A/ss-B, anti-nuclear antibody. We considered PH as the probable diagnosis and prescribed indomethacin at 0.9 mg/kg/day (divided into 2 doses a day) on the day of consultation. Two days after the consultation, he felt headache free (NRS 0) and left unilateral facial autonomic symptoms had gradually disappeared (Fig. 1b). Rash on the extremities was seen 10 days after the first consultation and drug eruption due to indomethacin was suspected. As a result, indomethacin was suspended 14 days after the first consultation and the rash subsequently disappeared within a few days. On a follow-up after 28 days, neither headache nor rash were present. As of the time of writing, 1 year after the first consultation, he has experienced no recurrence of headache.

**DISCUSSION**
We have described a rare pediatric case of PH, satisfying the diagnostic criteria of the International Classification of Headache Disorders, 3rd edition. PH is considered rare in children, although actual

**Conflict of Interest:** None

**Funding:** None
data are lacking. Thirteen case reports of 22 children with PH (including an 8+2+2 series) were identified from the English literature in a Pubmed search on October 24, 2018. The present case showed the shortest course of any of these cases of pediatric PH.

The typically short course of the disease acts as an obstacle to accomplishing diagnosis. Two detailed diagnoses are possible in PH. One is episodic paroxysmal hemicrania (EPH), characterized by headache attacks of at least 2 bouts lasting from 7 days to 1 year (when untreated) and separated by pain-free remission periods of more than 3 months. The other is chronic paroxysmal hemicrania (CPH). CPH requires a headache attack period without a remission period, or with remissions lasting less than 3 months, for at least 1 year. Because indomethacin achieved complete resolution of headache attacks in this case, we could not make a more detailed diagnosis of EPH or CPH. There are a few previous reports of such cases, as below. Three of 13 patients were able to stop indomethacin without headache recurrence after less than 6 months of treatment. Headaches in those 3 cases were presumed to represent first attacks of EPH. Headaches due to CPH with prolonged remission after indomethacin withdrawal have been reported.

This case raised 2 issues regarding treatment. First, our patient was prescribed indomethacin at 0.9 mg/kg/day and became pain free. The dosage of indomethacin prescribed in our case was low, at least compared with the dosages described in previous reports. The recommended dosage of indomethacin for CPH is 150 mg/day for adults if a smaller dosage of indomethacin does not achieve complete relief. The literature on the appropriate therapeutic dose of indomethacin for a child with PH is very scant. Blankenburg et al reviewed 8 children with PH and their therapy. They reported an effective starting dose of 3 ± 1.2 mg/kg/day and an effective maintenance of 0.5 ± 0.3 mg/kg/day. The patient showed the drug eruption presumably due to indomethacin. In previous reports, one-third of the children with PH treated by indomethacin showed adverse effects including restlessness, aggressive behavior, sleep disturbance, sweating and gastrointestinal side effects at a high dose. The rate of the children who underwent adverse effect is higher than that of the adults. Concurrently, the author reported that most adverse effects disappeared by dose reduction (50%).

In the other report, 1 (age was not described) of 25 patients with PH had a significant rash side effects requiring the discontinuation of indomethacin. To minimize the potential risk of adverse effects from medications, starting from a lower dose of indomethacin for PH is preferable. The second issue raised by this case involves the duration of treatment with indomethacin for PH, in that our patient was able to stop indomethacin without any recurrence of headache after only 14 days of treatment. He suffered headaches for only 8 days in total. The appropriate duration of indomethacin prescription thus remains unclear. According to a review of 74 patients with CPH, 9 of 13 patients were able to stop indomethacin without headache recurrence, and 3 of these 9 patients had headache durations of less than 6 months. This remission rate was very high. Taking these 3 cases and our case together, we hypothesized that early indomethacin therapy may raise the remission rate of PH. Accordingly, we suggest the importance of general doctors seeking early consultation with expert doctors to evaluate rare headache disorders such as PH.

CONCLUSION

We report the youngest case of PH to be described in Japan. This case also showed the shortest course of pediatric PH, raising issues of the duration between onset and start indomethacin therapy and of therapeutic duration. This case suggests the importance of improving awareness of pediatric PH among general doctors and of further investigations into low-dose and short-term indomethacin treatment.

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REFERENCES
1. Blankenburg M, Hechler T, Dubbel G, Wamsler C, Zernikow B. Paroxysmal hemicrania in children—symptoms, diagnostic criteria, therapy and outcome. *Cephalalgia*. 2009;29:873-882.
2. Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3rd edition. *Cephalalgia*. 2018;38:1-211.
3. Mack KJ, Goadsby P. Trigeminal autonomic cephalalgias in children and adolescents: Cluster headache and related conditions. *Semin Peadiatr Neurol*. 2016;23:23-26.
4. Gladstein J, Holden EW, Peralta L. Chronic paroxysmal hemicrania in a child. *Headache*. 1994;34:519-520.
5. Vieira JP, Salgueiro AB, Alfaro M. Short-lasting headaches in children. *Cephalalgia*. 2006;26:1220-1224.
6. Talvik I, Koch K, Kolk A, Talvik T. Chronic paroxysmal hemicrania in a 3-year, 10-month-old female. *Pediatr Neurol*. 2006;34:225-227.
7. de Almeida DB, Cunali PA, Santos HL, Briachis M, Prandini M. Chronic paroxysmal hemicrania in early childhood: Case report. *Cephalalgia*. 2004;24:608-609.
8. Klassen BD, Dooley JM. Chronic paroxysmal hemicrania-like headaches in a child: Response to a headache diary. *Headache*. 2000;40:853-855.
9. Kudrow DB, Kudrow L. Successful aspirin prophylaxis in a child with chronic paroxysmal hemicrania. *Headache*. 1989;29:280-281.
10. Moormani BI, Rothner AD. Indomethacin-responsive headaches in children and adolescents. *Semin Peadiatr Neurol*. 2001;8:40-45.
11. Broeske D, Lenn NJ, Cantos E. Chronic paroxysmal hemicrania in a young child: Possible relation to ipsilateral occipital infarction. *J Child Neurol*. 1993;8:235-236.
12. Seidel S, Weber C. Paroxysmal hemicrania with visual aura in a 17-year-old boy. *Headache*. 2009;49:607-609.
13. Raieli V, Cicala V, Vanadia F. Pediatric paroxysmal hemicrania: A case report and some clinical considerations. *Neurol Sci*. 2015;36:2295-2296.
14. Tarantino S, Vollono C, Capuano A, Vigevano F, Valeriani M. Chronic paroxysmal hemicrania in paediatric age: Report of two cases. *J Headache Pain*. 2011;12:263-267.
15. Boes CJ, Dodick DW. Refining the clinical spectrum of chronic paroxysmal hemicrania: A review of 74 patients. *Headache*. 2002;42:699-708.
16. Sjaastad O, Antonaci F. Chronic paroxysmal hemicrania: A case report. Long-lasting remission in the chronic stage. *Cephalalgia*. 1987;7:203-205.
17. Pareja J, Sjaastad O. Chronic paroxysmal hemicrania and hemicrania continua. Interval between indomethacin administration and response. *Headache*. 1996;36:20-23.