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Original Article

Ice pick headache and electrical seizures: a unique clinical entity?

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Abstract. Headache is often ignored as a symptom of epileptic seizure. To date, there have been no reports of ice pick headache as a symptom or association in epileptic seizure. Six children (ages 5.5-10 years; average 8.6 years; male-female ratio, 2:1) presenting with ice pick headache and paroxysmal electroencephalographic changes compatible with the diagnosis of epilepsy were evaluated. Only 66.6% had clinical seizures. The antiepileptic drugs were consistently effective in all cases. These findings seem to suggest that a distinct group of symptoms and signs (ice-pick headache, paroxysmal electroencephalographic changes, and epileptic seizure), which, associated together form a characteristic clinical picture or entity. This is the first report, to date. This report highlights the necessity to further search this unique clinical condition.

Key words: Ice pick headache, paroxysmal electroencephalographic changes, and epileptic seizure

1. Introduction

Headaches may occur in rare circumstances during a seizure. Symptoms besides headache may be either present or absent. The headaches itself may limit children's ability to observe or recall the manifestations of seizures. In Blume and Young's epilepsy unit, 2.8% of 858 patients had brief ictal pain and 1.3% (11 patients) had headache (1). Lansche (2) first described idiopathic stabbing headache as ophtalmodynia periodica in 1964. Since then, this disease has been designated by various terms, including ice-pick like pains, sharp short-lived headache , jolt and jabs headache, and idiopathic stabbing headache (2-5). Idiopathic stabbing headache is characterized by brief, sharp, severe jabbing pains about the head that occur either as single episodes or as brief repeated volleys. The pain resembles a stab from an ice pick, nail, or needle and typically lasts from a fraction of a second to 1 to 2 seconds (3). The frequency of attacks varies immensely, ranging from 1 attack per year to 50 attacks per day. Short-lasting headaches have been studied infrequently in children (6-8). To date, there have been no reports of association of ice-pick headache and epileptic seizure .

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2. Materials and methods

This study was set up at the author's private out -patient neurology clinic in remote North-East India in February 2002. Children with ice-pick headaches that occurred in isolation or in a cluster, with or without clinical seizures, without other primary headache syndromes at the time of presentation, with normal neurological and mental examinations were included. Ice-pick headache was defined as headache occurring as single stabs or series of stabs, stabs lasting for up to a few seconds and recurring with irregular frequency. An abnormal interictal electroencephalography was considered as essential inclusion criteria. None of the patients received treatment with antiepileptic drugs (AEDs) prior to inclusion. Children with ice-pick headaches with normal interictal electroencephalography were excluded. The author analyzed gender, age at onset of ice-pick headache, personal and family history of epilepsy

Table 1. Clinical characteristics of the six patients with ice pick headaches

Cases	1	2	3	4	5	6	
Age (year) at presentation	8	5.5	8.3	10	10	10	Mean 8.6
Sex	Male	Male	Female	Male	Female	Male	M:F 2:1
IPH onset age (year)	7	4	8.1	7	9.6	5	Mean 6.8
Family history	Epilepsy : Grandmother, Paternal aunts				Epilepsy: Grandmother Migraine: Mother		
Pattern of IPH	Singleton	Singleton	Volleys (10-40)	Singleton	Volleys (10-40)	Singleton	
Localization of headache	Multifocal	Multifocal	Unifocal: Orbital	Unifocal: Occipital	Unifocal: Frontal	Multifocal	
Duration of IPH	Fraction of a second	Fraction of a second	Fraction of a second	Fraction of a second	Fraction of a second	Fraction of a second	
Frequency of IPH	1-3 Days interval	1-3 Days interval	Daily	2-7 Days interval	3-7 Days interval	3-14 Days interval	
Precipitating factor of headache	Reading	Nil	Nil	Nil	Nil	Nil	
Interictal EEG	Generalized epileptiform discharges; TSW	Generalized epileptiform discharges; ASW	Generalized epileptiform discharges; ASW	Generalized epileptiform discharges, ASW	Generalized epileptiform discharges; TSW	Generalized epileptiform discharges; ASW	
Semiology of clinical seizures	Transient withdrawn from ongoing activities for a fraction of a second	Very transient staring with short spell of crying	NIL	NIL	Transient withdrawn from ongoing activities for a fraction of a second	very transient staring with ultra short unformed visual aura	66.6% (4)
CT Brain		Done, normal		Done, normal			
Treatment Gap (year)	1	1.5	0.2	3	0.6	5	Mean: 1.86
Treatment	Valproate 400 mg/d	Valproate 200 mg/d	Valproate 250 mg/d	Valproate 750 mg/d	Lamotrigine 50mg/d	Valproate 750 mg/d	
Follow Up Period (year)	0.6	2	2	0.6	0.3	1	Mean: 1.1
Follow Up	No IPH /new headache/ seizure	No IPH /new headache/ seizure	No IPH /new headache/ seizure	No IPH /new headache/ seizure	No IPH /new headache/ seizure	No IPH /new headache/ seizure	

TSW. Typical spike and wave, ASW: Atypical spike and wave, IPH: Ice pick headache

or febrile seizures, and migraine, duration, manifestations, frequency of attacks and evolution of ice-pick headaches with or without clinical seizures. EEGs were carried out in 32 channel machine taken during wakefulness and sleepiness, hyperventilation and intermittent photic stimulation. Electrodes were placed according to the International 10-20 systems. Computed tomography of the brain was performed in two cases. The patients were followed up during the period of February 2002 to May 2006 by the author.

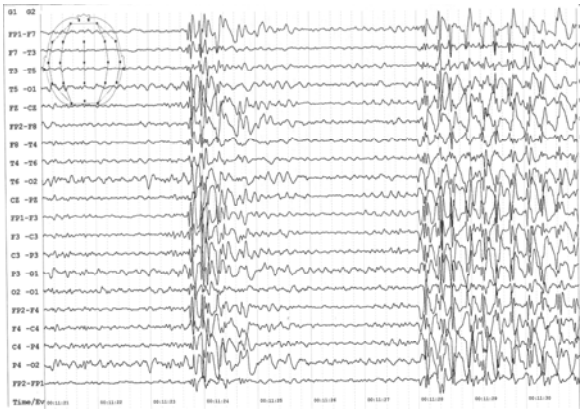

Fig. 1. Interictal EEG showing generalized spike-wave discharges.

3. Results

The clinical characteristics of patients are summarized on Table 1. Six children, four boys and two girls, (ages 5.5-10 years; average 8.6 years), met the inclusion criteria. The age at onset of ice-pick headaches ranged from 4 to 9.5 years, with a mean age of 6.8 years. A family history of epilepsy was found in two patients. A family history of migraine was found in one patient. None of the patients had a personal and family history of febrile seizures. The patterns of ice-pick headaches were singleton in four patients and in volleys of about 10 to 40 numbers in two patients. This pain was unifocal at the orbital, frontal, and occipital regions respectively in three patients (50%) and multifocal in other three patients (50%). The headache was precipitated in one patient during reading and there were no precipitating factors in others. All children had abnormal EEG compatible with the diagnosis of epilepsy, however, only 66.6% had clinical seizures and characterized by transient withdrawn from ongoing activities for a fraction of a second in two patients; very transient staring with short spell of crying in one patient; and very transient staring with ultra short unformed visual aura with colored and circular patterns in one patient. EEG discharges were generalized. EEG patterns were typical spike and wave discharges (range 2.5-4 Hz) in two children and atypical spike and wave discharges (range below 2.5 Hz and faster than 4 Hz) in four children. EEG pattern of one patient is shown on figure 1. Computed tomography of brain performed in two cases was normal.

There were treatment gaps ranging from 2 months to 5 years (mean, 1.86 years). All the patients were put on antiepileptic drugs, sodium valproate (doses ranging from 200 mg. to 750 mg. per day) in five patients and lamotrigine (dose, 50 mg. per day) in one patient. During a follow up period ranging from 3 months to 2 years (mean, 1.1 years) no recurrences of ice-pick headaches with or without clinical seizures were noted. Other primary headache syndromes did not accompany them either at the time of presentation or during the follow up period.

4. Discussion

Short-lasting headaches have been studied infrequently in children. They were in many aspects comparable to others from previous studies on idiopathic stabbing headache in children: no associated symptoms, no other associated headache, and frequent family history of migraine (6-8).

Ictal headache is found in Panayiotopoulos syndrome and Gastaut type childhood occipital epilepsy (late onset). In Panayiotopoulos syndrome, seizures are rare, usually only 1 to 3 occur, often nocturnally, have a long duration from 5 minutes to 10 minutes to hours, and cardinal ictal symptoms consisting of autonomic and behavioral disturbances, vomiting and deviation of the eyes. EEG shows characteristic occipital paroxysm (9). In late onset childhood occipital epilepsy (Gastaut type), seizures are frequent, sometimes daily, primarily diurnal, have a brief duration from seconds up to 2 minutes, and cardinal ictal symptoms mainly consist of visual seizures (10). One case in the present series was having ictal elementary visual hallucination with colored and circular patterns with transient staring associated with short lasting headache is likely to be Gastaut type childhood occipital epilepsy. But, EEG does not show characteristic occipital paroxysms of late onset childhood occipital epilepsy.

Interictal epileptiform discharges in the EEG are never diagnostic of epilepsy by themselves, but in the appropriate clinical setting, they

provide important circumstantial evidence for the diagnosis of epilepsy.

The seizures reported in this study are unclassified. The cases reported in this study may suggest either the coexistence of epilepsy and ice-pick headache, or ictal ice-pick headaches. The coexistence of ice-pick headaches and EEG abnormalities compatible with the diagnosis of epilepsy is hardly found in literature, but it is important to recognize that ice-pick headaches with EEG abnormalities with or without clinical seizures can occur in the same patient. To my knowledge, this is the first report of findings compatible with epilepsy associated with ice-pick headache. The author recognizes that this report has the limitations of a small sample and a small study period.

This study highlights the importance of EEG study on patients with ice-pick headache, even in the absence of clinical seizures. Imaging study of brain was performed in two cases only, because other parents refused consent to undergo brain imaging.

The response for antiepileptic drugs in these cases is generally good. During a mean follow up period of about one year, there was no recurrence of ice-pick headache with or without clinical seizures.

In conclusion, the results of this study demonstrate that ice-pick headaches with EEG abnormalities with or without clinical seizures might be a unique entity. Further reports may clarify to establish this unique clinical condition.

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