



Pictures portrayed by children with migraine with aura: a Turkish case series

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Abstract

Background Migraine is one of the most debilitating disorders with its chronic nature seen in childhood characterized by episodic bilateral or unilateral throbbing pain on the head that strikes at any time. It is divided into two categories as with or without aura and is diagnosed according to the 2013 International Headache Society criteria.

Aim and method This study aims to present the pictures depicted by adolescents aged 14–18 who were diagnosed with migraine with visual aura by Ankara Training and Research Hospital Child Neurology Department.

Results They were told to draw their visual auras as a picture that they depict or as a draft via changing another picture. In this article, five adolescents with migraine and their pictures related to their visual aura were presented.

Conclusion The diagnosis of migraine with visual aura in patients under 18 years of age would be supported by picturing of their visual images. Thus, pediatric patients could better express themselves and the clinician would better manage the process both in diagnosis and follow-up of the migraine with aura.

Keywords Children · Migraine · Aura · Picture

Introduction

Migraine is an episodic headache with throbbing and striking nature on the head that bilaterally or unilaterally occurs and increases with activities or exercises and lasts for hours, even days. It has a nature of debilitating since it occurs episodically and bilateral or unilateral throbbing pain on the head strikes

affected person at any time. The prevalence of migraine during childhood is estimated as 7–11% throughout the world [1]. Within 15–20% of migraine episodes, some warning symptoms called “aura” could emerge [2] and are thought to develop stemming mainly from cortical neural excitability [3]. Aura symptoms would be visual like blurry vision, or somatosensorial (numbness or tingling body parts, for instance), or more rarely as complicated visual images. These images include dazzling bright light, zig-zag lines, broken lines in older children, whereas in younger children, it might be speckles, balloons, colors and rainbow (positive scotoma), or vision loss (negative scotoma) [4] and developing of this type of images could result in some fear or anxiety in children or adolescents with migraine and naturally their parents.

Migraine is a well-documented disorder and is the most common cause of chronic headaches [5, 6]. The frequency of migraine changes according to gender and age range. In a retrospective review, the prevalence of migraine was reported as 1.2–3.2% (with more in boys) in ages 3 to 7 years, whereas 4–11% (equal in boys and girls) in ages 7 to 11 years and as 8–23% (more in girls) in ages 11 to 15 years [7]. Migraine is evaluated in two parts with aura and without aura. “Aura” is a recurrent and reversible focal neurological symptom that emerges gradually over 5–20 min lasting up to 60 min

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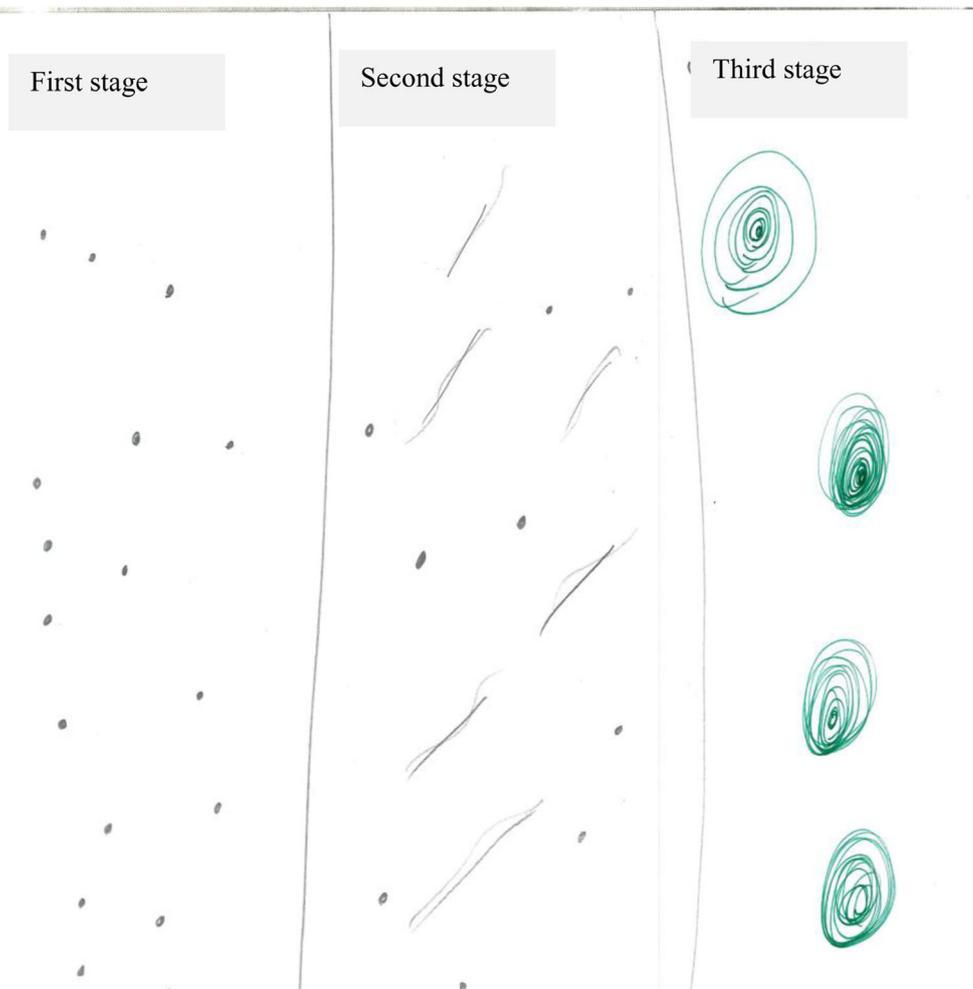
Table 1 International Headache Society (IHC) diagnostic criteria of migraine with aura (2013)

A. At least two attacks fulfilling criteria B–C
B. At least two aura symptoms that are reversible of the following:
1. Visual
2. Sensorial
3. Language and or speech
4. Motor
5. Brainstem
6. Retinal
C. The presence of at least two characters of the following four items:
1. At least one aura developing within at least 5 min slowly and/or two or more consecutive and different nature of aura symptoms
2. Each aura symptom continues 5–60 min
3. At least one aura symptom is unilateral
4. Headache starting during aura or within 60 min
D. It is not related another headache syndrome and transient ischemic attack is excluded

according to the International Headache Society (IHS) [8]. One of the explanations that points out the underlying mechanism of the aura is cortical spreading depression (CSD) triggered by local and transient hypoperfusion of the brain tissues [9]. The frequency of migraine with aura is at a proportion of 15–20% and is mostly consisted of visual symptoms [10]. Visual aura is thought to arise from transient oligoemia starting from the occipital area of the brain and then spreading to the visual cortex based on blood flow imaging studies [11] and brought about visual images including scotomas, blurry vision, scintillating bright light, and zig-zag lines. Visual aura is followed by the somatosensory symptoms like numbness of the body parts, sensation of tingling, and speech-related symptoms including slowed speech, Gibberish speaking, and expressive dysphasia [3, 12].

The diagnosis criteria of the International Headache Society are taken into consideration while diagnosing migraine [8]. The diagnostic criteria for migraine with aura are given in the Table 1 below.

In the literature, a few studies related to migraine with aura were found. One of them was the study conducted by Petrusic

Fig. 1 Picture portrayed by case 1 with migraine with aura

et al. (2014) with 40 teenagers (20 boys, 20 girls) with migraine with aura [3]. They evaluated these adolescents via a questionnaire to collect variables regarding migraine and aura of visual, somatosensorial, and higher cortical dysfunction symptoms. They reported that visual aura had occurred in every attack, as mainly scintillating scotoma or blurry vision but the authors had not adolescents drawn a picture of their visual images. In another study, Russell and Olesen (1996) analyzed migraine with aura for the first time as nosographically with 163 adults among the 4000 people [13]. Sixty-two had attacks of migraine aura with headache and most (99%) symptoms that occurred were visual including flickering, and uncolored, zig-zag lines in the center of the visual field. But, again, these visual images were obtained from patients as verbal description not pictured or drawn images. One study found in the literature regarding migraine with aura and visual images pictured was conducted total 122 participants with migraine aged 18-78, mean age was 41.6 years, and 76.3% of has visual symptoms [14]. The most common symptoms were blurred vision and bright dots. In this study, participants did not only describe their visual symptoms but also they did draw a picture related to their aura symptom. All other studies we found in the literature reporting migraine with aura were related to neuroimaging, frequency, risk factors, and sociodemographics of the childhood migraine with visual auras.

In this perspective, our study is the very first one to evaluate adolescents with migraine with aura in terms of visual images pictured. We asked to draw their visual aura symptoms from five adolescents diagnosed with migraine according to the International Headache Society (IHS) 2013 criteria. Six samples of pictures that belong to the patients were presented here together with the characteristics of the cases. We asked them to describe their aural symptoms via drawing as what they saw before starting their headache as a picture or via pointing or depicting on a paper (scotoma as black drawing or zig-zag lines on an ordinary A4 paper, for instance).

Case series

Case 1

A 14-year-old girl was admitted to our clinic for the first time in 2015 due to headache. She had complaints for 5 months and had headaches four times a month, continuing for 5 to 6 h of throbbing type. Before the onset of the pain, she felt pain and explained the visual aura. It was learned that the pain started in the right eye accompanied by nausea, vomiting, photophobia, and phonophobia. She said that she felt the headache as more increased by the stress and to be lesser with sleep. The prenatal, natal, and postnatal history of the patient was unremarkable. There

was no trauma history. She had age-appropriate development stages and had middle school success. Her mother had migraine. In the physical examination of the patient whose vital signs were stable, the general system examination was normal, and the detailed neurological examination was normal including the findings of that light reflexes which were bilaterally positive; pupils were isochoric; eye movements were free; fundus, cranial nerves, muscle tone, and cerebellar examination were normal; five deep tendon reflexes (DTRs) were normoactive; Babinski reflex was bilaterally flexor; muscle strength of all extremities was 5/5; and the walking was normal. Neuroimaging and blood tests (complete blood count, liver and kidney function tests, electrolytes, vitamin B12 level) were examined. The cranial MRI examination and blood test findings were all normal. The patient who was diagnosed with migraine with aura in her follow-up was asked to draw a picture and the picture that she drew was as follows (see Fig. 1).

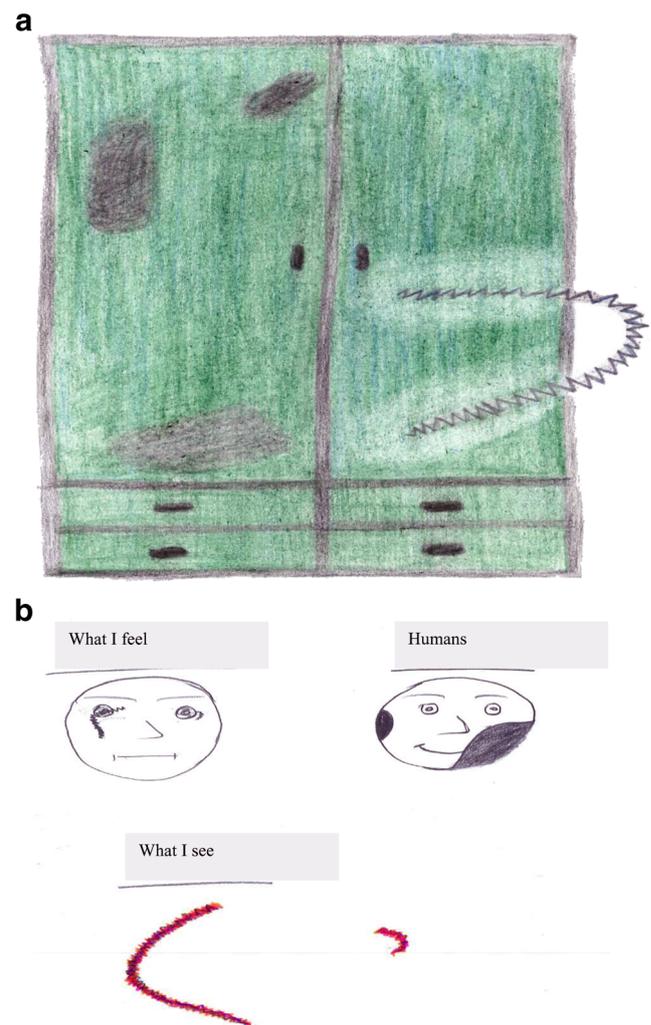


Fig. 2 a and b Picture portrayed by case 2 with migraine with aura

Case 2

A 17-year-old girl was admitted to our clinic for the first time in 2015 due to headache. She said that she had complaints for 2 years and had headaches seven times a month, all day long with throbbing nature. She stated that she did not feel pain before the onset of pain and described the visual aura. Her pain was starting from the frontal region and was accompanied by nausea, vomiting, and phonophobia. This pain was

sometimes awaking her from sleep, but it usually dissolves after sleeping. The prenatal, natal, and postnatal history of the patient was unremarkable. There was no trauma history. Her developmental stages were normal and academic achievements were excellent. She had no migraine history in her family. In the physical examination of the patient, it was revealed that all vital signs were stable, the general system examination and the detailed neurological examination were normal. The cranial MRI and all blood tests examined were

Fig. 3 Draft pictured by case 3 with migraine with aura

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normal. The patient who was diagnosed with migraine with aura in his follow-up was asked to draw a picture and the pictures she drew were as the following (see Fig. 2a, b).

Case 3

A 17-year-old girl was admitted to our clinic for the first time in 2017 due to headache. She had complaints for 15 months and headaches 15 times a month, 3 h, with the throbbing type. She said that she did not feel pain before the onset of pain and that she had seen a flash of light along with pain. Her pain was starting from the occipital region, and nausea and phonophobia was accompanying it. She complained that her pain sometimes awakened her from sleep, and her pain usually did not disappear after falling asleep. The prenatal, natal, and postnatal history of the patient was unremarkable. There was no trauma history. Her developmental stages were appropriate with her age and she had good school success. She had no family history of migraine. Her physical examination, general system examination, and the detailed neurological examination were normal. The cranial MRI examination was unremarkable and her blood tests were all normal. The patient who was diagnosed with migraine with aura in her follow-up period was asked to draw a picture and the picture that she drew is as follows (see Fig. 3).

Case 4

A 14-year-old boy was admitted to our clinic for the first time in 2017 because of his headache complaint. He stated that he had complaints for 4–5 years with the frequency of 12 times in a month lasting 4 h per month. He stated that he did not feel the pain before the onset of pain and that he lost sight of his vision partly during the headache and that he felt his vision as clouded (blurry vision). It was learned that his pain started from the vertex part of his head and was accompanied by phonophobia. He noted that his headache was increasing with hungry, and it was healing with sleeping. He had no prenatal, natal, or postnatal history of pathologies and no trauma history. His developmental stages were normal and his school performances were good. His father had a migraine. His physical examination, general system examination, and the detailed neurological examination were normal. The cranial MRI findings and his blood tests were unremarkable. The patient was diagnosed with migraine with aura in his follow-up and was asked to draw a picture related to his visual images. The picture he drew was as follows (see Fig. 4).

Case 5

A 16-year-old girl was admitted to our neurology clinic for the first time in 2015 because of headache. She stated that she had

complaints for 2 years and that her headaches were of a throbbing type that lasted for 2–3 h once a year. She was complaining of numbness located on her left leg, her left arm, and in the left half of her face and she could not see clearly half of the objects just before her headache starts. Nausea and photophobia were accompanying the headache. The prenatal, natal, and postnatal history of the patient was unremarkable and had no trauma history. She had also normal developmental stages and had good school performance. She had no family history of migraine. Her physical examination, general system examination, and the detailed neurological examination were all normal. The cranial MRI findings or her blood tests did not reveal any pathologies. The patient was diagnosed with migraine with aura and in her follow-up period was asked to draw a picture and the picture that she drew was the following (see Fig. 5).

Discussion

Headache has been reported to be a commonly seen disorder in childhood after abdominal and skeletal system pains and it was defined as one of the debilitating disorders that affect children's physical and mental status, school success, and quality of life [15]. Especially fear and anxiety stemming

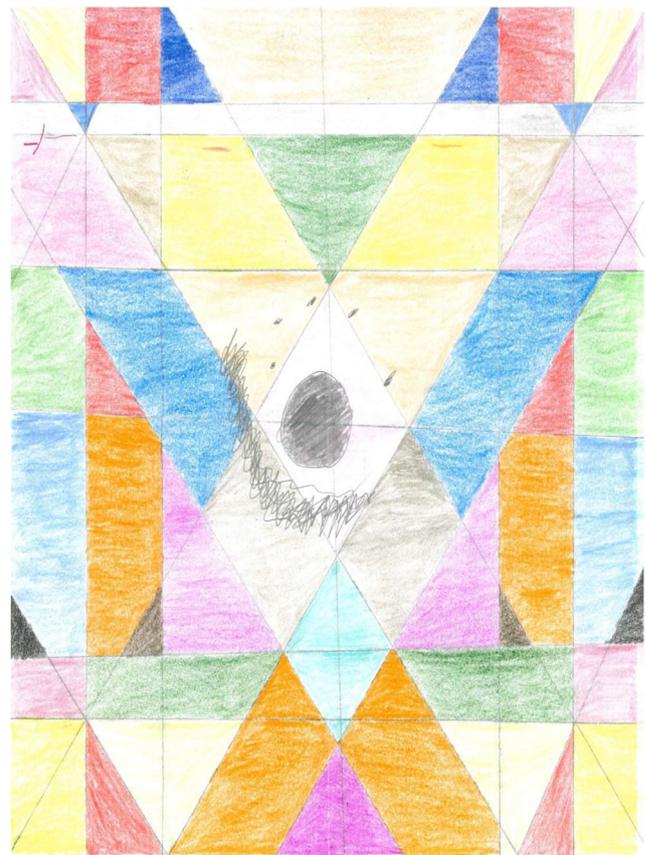
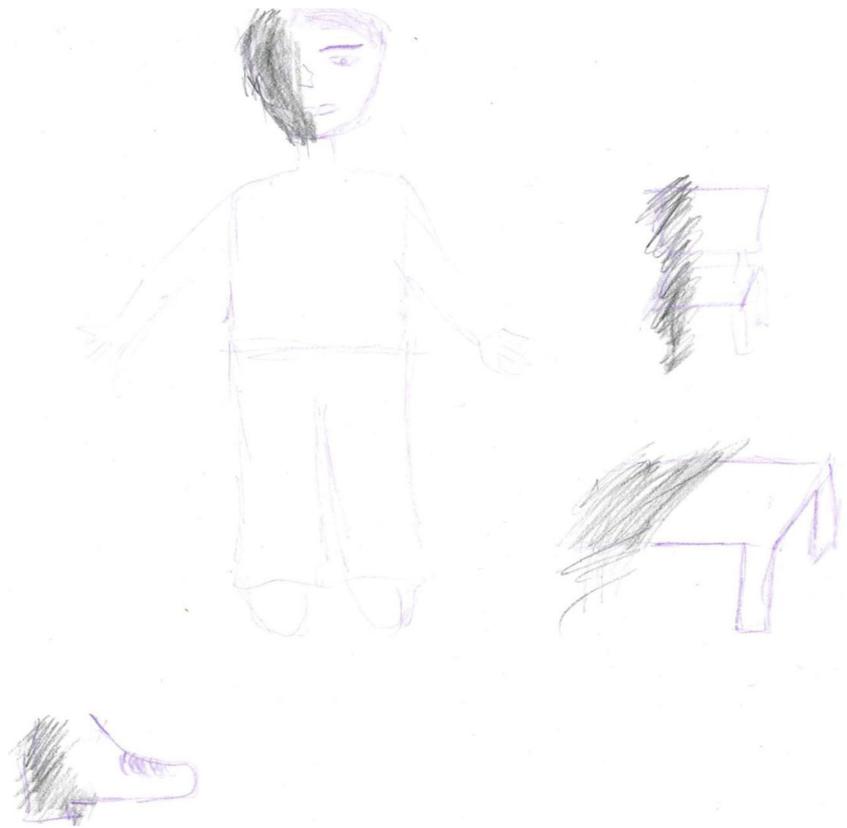


Fig. 4 Picture and draft depicted by case 4 with migraine with aura

Fig. 5 Picture portrayed by case 5 with migraine with aura



mainly from experiencing of a visual images in migraine with visual aura might result in panic both the child and the family. Since the migraine is frequently seen chronic headaches [5, 6], many studies related to it are still carried out.

Migraine is diagnosed based on IHS-3 criteria after exclusion of all possible headache causes carrying out with thorough examination, laboratory tests, and imaging methods. However, this process is slightly longer in childhood migraine with aura due to the inability of the subjects to be able to clearly identify their auras. Sometimes, descriptions of the visual images experienced by affected person could lead to confusion over the physician especially whom they cannot be able to describe. In these situations, drawing a picture would a better solution to define the problem.

Conclusion

This study has been conducted on the basis of the adolescents with migraine with visual aura who could not clearly explain the visual symptoms that they see. In this perspective, this study is the very first one to evaluate adolescents with migraine with aura in terms of their visual images as depicted in the pictures. We asked five adolescents, aged 14 to 18 years who had migraine with visual aura, to describe their visual symptoms via drawing as what they saw before starting their

headache as either a full picture or just drafting of their images. The diagnosis of migraine with visual aura in patients under 18 years of age would be supported by drawing their visual images. Thus, pediatric patients could better express themselves and the clinician would better manage the process both in diagnosis and follow-up of patients with migraine with aura.

Compliance with ethical standards

Competing interests The authors declare that they have no competing interests.

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