

6-23-2019

## Clinical, Neurological and Diagnostic Aspects of Headaches in Patients with Congenital Precerebral Angiodysplasias

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### Recommended Citation

Khalimova, Kh.M.; Rakhmatullaeva, G.K; Antanas, Vaitkus; and Rashidova, N.S (2019) "Clinical, Neurological and Diagnostic Aspects of Headaches in Patients with Congenital Precerebral Angiodysplasias," *Central Asian Journal of Medicine*: Vol. 2019 : Iss. 2 , Article 6.  
Available at: <https://uzjournals.edu.uz/tma/vol2019/iss2/6>

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## Clinical, Neurological and Diagnostic Aspects of Headaches in Patients with Congenital Precerebral Angiodysplasias

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### Article info

*Published: june 2019 y*

**Key words:** migraine, pre-cerebral angiodysplasia, tension headache, cluster headache.

### ABSTRACT

**Objective:** To study the clinical, neurological and diagnostic aspects of headaches in congenital pre-cerebral angiodysplasia.

**Materials and Methods:** There were 213 patients with headaches under our supervision. The core of the studied cohort was migraine patients, which amounted to 179 (100%) cases, among them migraine with angiodysplasia- (MWA) was 136 (45.9%), followed by patients with migraine without angiodysplasia (MWOA) – 43 (14.5%), tension headache (TH) – 26 (8.8%), cluster headache (CH) – 8 (2.7%) patients. The study used clinical neurological, neuropsychological, neuroimaging and statistical methods.

**Results:** Migraine can develop in people with congenital pre-cerebral angiodysplasia in 76% of cases, and in people without congenital abnormalities of cerebral vessels – 24%. At the same time, patients with congenital pre-cerebral angiodysplasias most often develop migraine with aura in 62.5% of cases, whereas without it its simple form is 88.4%. Indicators of the scale of VAS, MIDAS and HALT index were the highest in the group of patients with combined angiodysplasias, amounting to  $9.02 \pm 0.09$ : $20.9 \pm 0.2$  and  $21.1 \pm 0.2$  points, the lowest with isolated hypo/aplasias and pathological PA deformations  $6.5 \pm 0.04$ : $15.5 \pm 0.1$ :  $16.5 \pm 0.1$  and  $6.6 \pm 0.04$ : $15.5 \pm 0.1$ : $16.5 \pm 0.1$ , respectively.

**Conclusions:** Congenital precerebral angiodysplasia can lead to the development of migraine, most often migraine with aura, while they have a high intensity headache, with a decrease in the daily activity of patients and the need for medical care.

Headache is a symptom that accompanies various diseases, with various causative factors, and is a multidisciplinary problem. Almost 90% of women and 70% of men regularly experience it, and for 20% of them it becomes a serious problem [1,3,4]. Moreover, the published WHO reports indicate that in the United Kingdom of Great Britain and Northern Ireland, due to migraine alone, about 25 million working or school days are lost annually, and 50% of patients with hypertension are self-medicating [5,6]. In this regard, it is important to analyze the features of the clinical and neurological course of cephalgic syndromes with congenital anomalies of the cerebral vessels.

### Objective:

The study of clinical, neurological and diagnostic aspects of headaches in congenital precerebral angiodysplasias.

### Materials and methods:

Total of 213 patients with headaches were under our supervision. The core of the studied cohort was 179 patients with migraine, including migraine with angio dysplasia (MWA) - 136 (45.9%), with migraine without angio dysplasia (MWOA) - 43 (14.5%), with tension headache (TH) - 26 (8.8%), with cluster headache (CH) - 8 (2.7%). The study used clinical, neurological, neuropsychological, neuroimaging and statistical methods.

### Results:

An analysis of migraine with and without angio dysplasia revealed its following features: among MWOA patients, a predominantly simple form of migraine was found in 38 (88.4%), while in angio dysplasia only in 51 (37.5%). Migraine with aura in the group with angio dysplasia occurred in 85 (62.5%). Moreover, in 49 (57.6%) of them there was an ophthalmic form, in 18 (21.2%) - basilar, ophthalmoplegic and retinal forms were found in 7 (8.2%) and 4 (4.7%) patients. With a combination of hypo- or aplasia with kinking of the vessels of the brain, migraine was observed, which in the clinic resembles sporadic hemiplegic migraine. Migraine with aura in MWA occurred only in 5 (11.6%) patients, while 4 had ophthalmic migraine and 1 had basilar migraine. Thus, with MWA, migraine with aura predominates, then with MWOA its simple form occurs.

A study of the incidence of various forms of migraine depending on age showed that in 2 patients under 16 years of age, MWA was presented in a simple form, in another 2 (20%) - ophthalmic, in 3 (30%) - basilar. In MWOA, a simple form was observed in 2 (20%) of the examined, and basilar in only 1 (10%) of the patient. At the age of 16-24 years with MWA, a simple form was observed in 10 (28.6%) patients, its ocular form in 11 (31.4%), and ophthalmoplegic 3 (8.6%), respectively, in 2 (5.7%) and 2 (5.7%) - basilar and retinal, in 1 (2.9%) 2 (5.7%) - according to the type of sporadic hemiplegic form. Moreover, in 4 (11.4%) patients with MWOA, a simple form occurred, in 2 (5.7%) - ocular. At the age of 25-44 years, the ocular form was found in 33 (27.5%), the simple form in 30 (25%), the basilar form in 11 (9.2%), the retinal form in 5 (4.2%), ophthalmoplegic - in 4 (3.3%), sporadically hemiplegic forms - in 3 (2.5%). In patients of this age with MWOA, a simple form of migraine was diagnosed in 32 (26.6%) of the examined, the eye form in only 2 (1.7%).

It should be noted that in patients aged 45-59 years, MWOA did not occur, while MWA took place. At this age, its components were the simple form - 9 (64.3%), the ocular form - in 3 (21.4%), the basilar form - in 2 (14.3%). The most common cause of migraine in the general population was hypo-, aplasia of the posterior connecting arteries and anterior connecting arteries, as well as trifurcation. According to some authors [2,7,8], trifurcations of the internal carotid artery (ICA) are the most dangerous, since they affect the distribution of blood in the brain and subsequently can lead to the development of aneurysms in both the anterior and posterior parts of the Willis circle.

Among our patients, ICA trifurcation was diagnosed in 20 (5.4%), while posterior trifurcations were more common in 16 (4.3%) than anterior ones in 4 (1.1%). Posterior ICA trifurcations in 7 (43.8%) patients showed simple migraine, and in 9 (56.2%) classical. Anterior trifurcation was detected in 1 (25%) patient with simple migraine and in 3 (75%) - basilar. Thus, in patients with MWA, migraine with aura mainly occurs, a rare basilar form occurs, and migraine develops as a sporadic hemiplegic form, which are directly related to the presence of precerebral angiodyplasia.

Because of an active survey of patients with headaches, provoking factors were identified. In MWA, smoking was the provoking factor in 27 (19.8%), weather changes in 26 (19.1%), hunger in 22 (16.2%), and consumption of foods rich in tyramine.

Moreover, 15 (11%) patients drank 4-5 cups of coffee, and 15 (11%) patients had a headache associated with irregular working hours, that is, work on a night shift or round-the-clock work, followed by a day off. Another 13 (9.5%) patients called the headache a busy schedule, without change, while 5 (3.7%) patients associated headaches with stress, 13 (9.5%) actively responded to strong odors. 10 (23.2%) MWOA patients cephalgia associated more with strong odors, 6 (14%) - with smoking, 5 (11.6%) - with a change in weather, the menstrual cycle and the use of coffee and chocolate. As a result of lack of sleep, headaches appeared in 4 (9.3%) patients, a busy work schedule - in 2 (4.6%), stress and hunger - 3 (7%) each.

An analysis of the provoking factors in patients with TH showed that 17 (65.4%) had a connection with stress, and 9 (34.6%) had a busy working day. With CH, 5 (62.5%) patients could not associate headaches with anything, while 3 (37.5%) patients indicated that alcohol consumption was a causative factor.

At the next stage of our work, we analyzed the age at which the headache itself began, its duration, expressed in hours within a single seizure, as well as the frequency of headaches per month and days per month, depending on the type of headache. In patients with MWA, cephalgia began in childhood, on average, at  $7.5 \pm 0.19$  years, in patients with MWOA - from  $20.9 \pm 0.4$  years, and in patients with TH - at a young, most able-bodied age  $37, 7 \pm 0.3$  years, and mainly  $28.8 \pm 1.6$  years of men were exposed to CH.

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The duration of headache during an attack in patients with MWA averaged  $14.3 \pm 0.07$  h, with MWOA -  $9.4 \pm 0.1$  h, with TH -  $6.03 \pm 0.06$  h, with CH -  $1,8 \pm 1.6$  hours. The duration of headaches per month in patients with MWA was  $79.2 \pm 0.08$  hours, MWOA -  $51.7 \pm 0.09$  hours, TH -  $144.8 \pm 2.1$  hours, CH -  $38.6 \pm 0.7$  hours. Patients with MWA experienced headaches on average  $8.4 \pm 1.3$  days for a month, with WOA -  $5.5 \pm 0.07$ , with TH -  $14.2 \pm 0.1$ , with the CH -  $4.8 \pm 0.1$  days.

Data on headache intensity calculated on a visual analogue scale, and the quality of life of patients evaluated on the MIDAS scale, as well as information on days lost due to headache, according to the HALT index, are given in the table.

**Table 1.****Assessment of headache intensity and quality of life of patients**

Шкала	MWA	MWOA
VAS	$8.3 \pm 0.085$	$5.4 \pm 0.20$
MIDAS	$20.7 \pm 0.19$	$10.4 \pm 0.16$
HALT	$18.7 \pm 0.14$	$16.1 \pm 0.14$

The intensity of headaches according to the VAS scale in patients with MWA was  $8.3 \pm 0.085$ , patients with MWOA experienced slightly less intense pains -  $5.4 \pm 0.20$ , the most severe cephalgia was observed in men with CH -  $9.8 \pm 0.09$ , and patients with TH had low rates -  $4.4 \pm 0.07$ . Evaluation of daily activity according to the MIDAS scale revealed severe headaches in MWA patients that severely disrupted daily activity -  $20.7 \pm$

0.19, while in patients with MWOA there was a significant violation of daily activity associated with headache with a score of  $10,4 \pm 0.16$ . The average score for the HALT index in patients with MWA was  $18.7 \pm 0.14$ , which corresponded to IV, the highest level, which means a high need for medical care, while in patients with MWOA -  $16.1 \pm 0.14$  points, which corresponds to level III, these patients also need treatment. It should be noted that the higher the scores for patients on the MIDAS scale, the higher the scores of the HALT index. This means that these patients have a pronounced violation of the quality of life, requiring medical attention.

#### **Conclusions:**

1. Congenital precerebral angiodyplasia can lead to the development of migraine, most often migraine with aura.
2. Migraine in patients with congenital precerebral angiodyplasia occurs with a high-intensity headache with a marked decrease in daily activity and the need for medical care.

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