



KAMST – Simple method for patients with migraine screening

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ABSTRACT

Migraine is highly prevalent and disabling disorder, but despite that one of the main problems that remains in the clinical practice is delayed diagnosis and delayed specific treatment that has impact on patients' quality of life and productivity. There should be easy acceptable method to select those patients who might have migraine and who need to be referred to neurologist's consultation. We hypothesize that our created KAMST questionnaire is reliable method to select patients who might have migraine in primary care. To evaluate our hypothesis we made a research that consisted of two parts. Part A consisted of closed type questions made by The International Classification of Headache Disorders 3rd edition diagnostic criteria of migraine without aura. Part B was KAMST questionnaire. 298 patients were questioned. 209 (72%) of them were women and 89 (28%) - men. According to The International Classification of Headache Disorders 3rd edition migraine without aura diagnostic criteria, migraine was diagnosed for 42 (14,1%) patients, and according our KAMST questionnaire – 83 (27,9%). From 42 patients whom migraine was diagnosed with The International Classification of Headache Disorders 3rd edition criteria, 34 (81%) of these patients migraine was diagnosed with KAMST. From 256 patients whom migraine wasn't diagnosed with The International Classification of Headache Disorders 3rd edition criteria, 49 of them (19,1%) migraine was diagnosed with KAMST. We found statistically significant difference between questionnaires. KAMST sensitivity was – 81%, specificity – 81%, predictive positive value – 41%, predictive negative value – 96%, the Cronbach alpha for the total scale was 0,604. Our KAMST questionnaire of migraine is reliable and valid method for patients' screening but has some limitations.

Introduction

Headache is one of the most common medical problems around the world [1], causing socioeconomic problems and financial costs to society [2,3]. In the world, half to three quarters of adults, aged from 18 to 65 years, had a headache in the last year, about 30% reporting migraine headache [4].

Overall, migraine affects 11.6% people worldwide, with the statistically significant increasing prevalence between the 1930 and 2015 [5]. Migraine is about two times as common in woman compared to males [5,6]. Migraine is not fatal disease, but causes disability (20,3million years lost due to disability in 2016) [7]. It is one of the ten leading causes of disability worldwide [8]. Migraine may begin in childhood, but prevalence increases until 35 to 39 years of age [6]. In Lithuania, migraine prevalence was about 20,4% and it was 3-times more common among females than males [9].

The main causes of migraine remain incompletely understood, but in some studies there are identified some different gene polymorphisms that are associated with migraine [10]. One of the hypothesis widely

accepted nowadays is neurovascular hypothesis, claiming that migraine is a disorder of the endogenous pain modulating system, when inherited dysfunction, homeostatic disturbances in sensory modulatory system, causes interruption of normal neural connections [11]. There is no diagnostic test for migraine and commonly patients are with normal neurological examination and unremarkable neuroimaging tests [12], so diagnosis starts from carefully obtained headache history and headache characteristics. The International Classification of Headache Disorders 3rd edition (ICHD-3) is currently the main standard for diagnosis of migraine and other headaches [13].

In the ICHD-3 classification migraine is divided into two types: migraine without aura and migraine with aura [13]. Migraine without aura is a clinical syndrome characterized by headache attacks, lasting 4-72 hours, mainly unilateral location, pulsating quality, moderate or severe intensity, aggravated by physical activity and having leading symptoms (nausea, vomiting, photophobia and phonophobia). Migraine with aura is characterized by transient focal neurological symptoms that precede or accompany the headache. Some patients experience premonitory symptoms during prodromal phase, that could

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occur hours or days before the headache or postdromal phase after headache. These symptoms are hyperactivity, depression, food cravings, yawning, fatigue, neck stiffness or pain [13].

About 2.5% of patients with migraine has tendency to chronify each year [14]. Chronic migraine is characterized when headache attacks occur 15 and more days per month for more than 3 months, on at least 8 days per month has migraine headache features [13]. The global prevalence of chronic migraine is ranged from 0,5 to 5% [15].

Migraine is associated with many psychosocial problems such as anxiety, reduced health-related quality of life, work productivity, reduced vitality, fatigue, difficulties at work, social functioning and more [16,17]. Patients with migraine have higher risk of developing depression compared with subjects without migraine [18,19]. Moreover, migraine with aura is associated with a higher risk of stroke and myocardial infarction [20]. In one study 15 % of patients with migraine met criteria for acute medication overuse, especially patients with higher pain intensity, symptom severity scores and triptan, opioids and barbiturate users [21].

Migraine management should include control of exacerbating factors, acute attacks treatment and preventive treatment if needed. Main migraine triggers are skipped meals, irregular caffeine intake, irregular sleep and stress [22].

The hypothesis

Even migraine is highly prevalent and disabling disorder [5,8], one of the main problems that we see in the clinical practice is delayed diagnosis and delayed specific treatment [23] that has impact on patients' quality of life, productivity at work and at home [16,23]. Patients cannot access appropriate healthcare and disease management which would help to control the headache attacks and decrease global burden.

The ICHD-3 beta is currently considered the main standard in clinical practice for diagnosis and classification of migraine and other headaches [13]. In this classification diagnosis of migraine is maintained by duration of headache, headache characteristics and accompanied symptoms. Some researchers claim that many patients with migraine are misdiagnosed, partly because of a traditional focus on the severity and quality of pain as the primary diagnostic criteria (22).

In Lithuania, as worldwide, headache is common neurological problem [9], mostly these patients are seen in primary care units. There should be easy acceptable method to select those patients who might have migraine and who need to be referred to neurologist's consultation. Searching for this method of patients screening, based on our clinical experience, new migraine questionnaire was created. It consists of 3 questions which you can see in Table 1.

We hypothesize that our created questionnaire is reliable method for patients or general practitioners in primary care to select patients who might have migraine.

Evaluation of the hypothesis

To evaluate our hypothesis we made a research. Permission for carrying out a study was obtained from the Center of Bioethics of the Lithuanian University of Health Sciences. Each patient signed writing consent form of participation in the study. For the research we used anonymous survey method. Research was carried out in 4 different

Table 2
ICHD-3 migraine criteria.

Part A questionnaire:
1. At least five attacks fulfilling criteria B-D
2. Headache attacks lasting 4–72 h
3. Headache has at least two of the following four characteristics:
1. unilateral location
2. pulsating quality
3. moderate or severe pain intensity
4. aggravation by or causing of physical activity
4. During headache at least one of the following:
1. nausea and/or vomiting
2. photophobia and phonophobia

primary care units in Lithuania.

Our survey consisted of two parts. In part A patients filled closed type questions made according to ICHD 3 diagnostic criteria of migraine without aura (Table 2). Part B was of 3 our proposed questions that you can see in Table 1. In the part B migraine was diagnosed when positive were at least two answers.

298 patients were questioned. 209 (72%) of them were women and 89 (28%) - men. Age average didn't differ significantly (women $42,3 \pm 13,8$ years), men $45,0 \pm 16,4$ years). According to part A results, 62,4% of respondents had a headache less than 4 h duration (Fig. 1).

Commonly it was moderate intensity (29,9%) and pulsating quality (28,2%) (Fig. 2).

There were no leading symptoms for more than a half of respondents. Main leading symptoms were nausea (26,8%) and phonophobia (20,1%) (Fig. 3). There was no statistically significant difference comparing headache duration, quality and leading symptoms between males and females, but women experienced severe headache more often than men ($p < 0,05$). Fig. 4.

According to part B questionnaire, headache attacks (episodic headache) felt 44,3% of respondents. For 61,4% of these respondents, headache impaired their working capacity. 51,3% always carried analgetics with themselves, mostly women ($p < 0,01$).

According to ICHD-3 migraine without aura diagnostic criteria, migraine was diagnosed for 42 (14,1%) patients, and according to our proposed questionnaire – 83 (27,9%).

From 42 patients whom migraine was diagnosed with ICHD-3 criteria (part A), 34 (81%) of these patients migraine was diagnosed with our questionnaire (part B). From 256 patients whom migraine wasn't diagnosed with ICHD-3 criteria (part A), 49 of them (19,1%) migraine was diagnosed with our questionnaire (part B).

Comparing these two questionnaires (part A and part B) we found statistically significant difference

(Pearson $\chi^2(1) = 68,6$, $p < 0,001$). Our proposed questionnaire sensitivity was – 81%, specificity – 81%, predictive positive value – 41%, predictive negative value – 96%. Test – retest reliability was good, the Cronbach alpha for the total scale was 0,604.

Discussion

During our research we found that our proposed questionnaire of migraine is reliable and valid method for patients' screening. We think that our questionnaire is easy acceptable method that could be used in

Table 1
Patients' screening questionnaire (KAunas Migraine Screening Test "KAMST").

Lithuanian version of questionnaire	English version of questionnaire
Ar patiriate priepuolinį galvos skausmą?	Do you experience headache attacks?
Ar galvos skausmas sutrikdo jūsų darbingumą?	Does the headache impair your working capacity and daily activity?
Ar jūs nešiojate vaistų nuo galvos skausmo?	Do you carry painkillers with yourself?

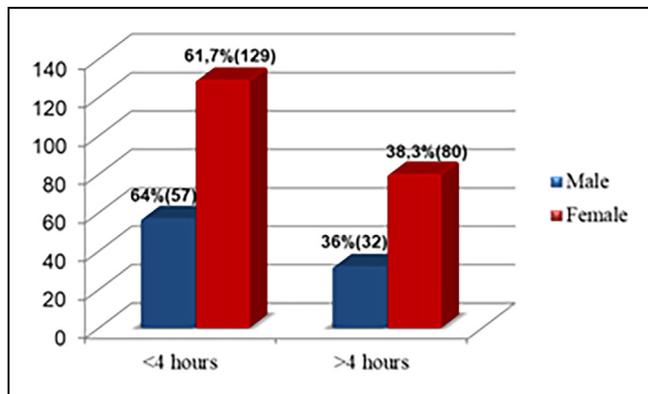


Fig. 1. Headache duration and its distribution by gender.

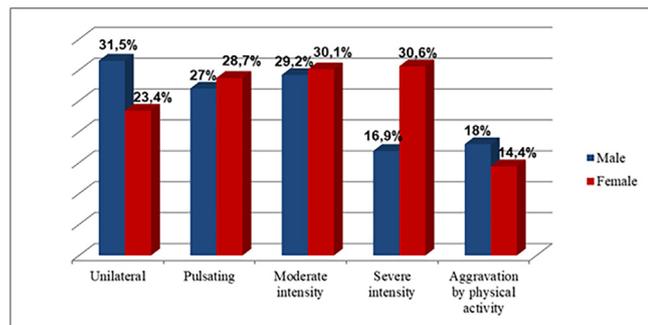


Fig. 2. Headache quality and its distribution by gender.

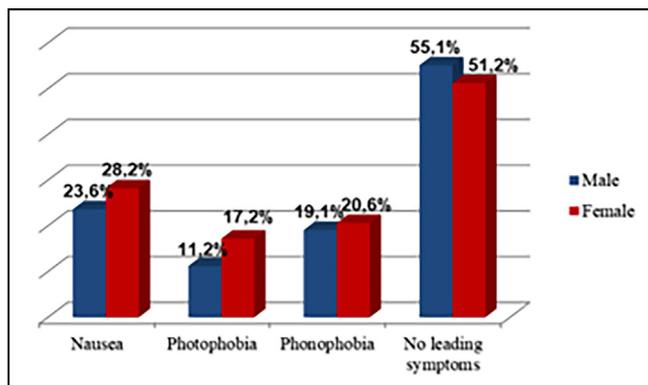


Fig. 3. Leading symptoms and its distribution by gender.

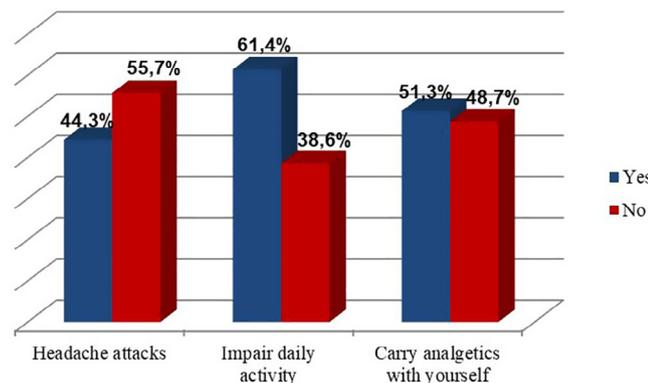


Fig. 4. Results of our questionnaire.

primary care.

In our health system in Lithuania, general practitioners can only recognize migraine and refer those patients to neurologist for further evaluation. Migraine patients account for up to 10% of all outpatient neurology consultations [24]. Even higher prevalence of migraine is seen in neurologists compared to non-neurologists, maybe because of increased awareness of migraine and its manifestations [25]. Not all patients with headache need neurologist evaluation. So appropriate patients screening helps to select targeted patients, refer them to the specialist that could diagnose and treat those patients with migraine earlier.

Some studies were carried out trying to find a screening for migraine that could be used in primary care. ID Migraine is a questionnaire based of 3 predictors for diagnosing migraine without aura – photophobia, disability and nausea [26]. According to the results of the research these three positive answers have a sensitivity of 81% and a specificity of 75% of diagnosing migraine [26]. ID Migraine questionnaire concentrate on leading symptoms, but as you can see in Figure 3, in our study we found that main leading symptoms were nausea (26,8%) and phonophobia (20,1%), while photophobia left only in the third place with 14,1%.

10-item Headache Screening Questionnaire for migraine and tension-type headache consists of 10 questions about headache, its frequency, duration, quality, intensity and effect on daily activity [27]. The research showed sensitivity of 69%, specificity of 90% of diagnosing migraine with this questionnaire. Headache Screening Questionnaire concentrate on features of the headache, the rating scheme is complex. Because of difficulty filling this questionnaire, it would be harder to adapt it for patients and specialists in primary care.

One proposed questionnaire that is based on clinical features of headache is Migraine Screen Questionnaire (MS-Q) [28]. In MS-Q questionnaire there are questions about headache, its duration, leading symptoms and does it affect daily activity. Authors found this questionnaire useful in primary care. But comparing MS-Q and KAMST questionnaire, we think that third question is unique and makes advantage of our proposed questionnaire. It obliges a person suffering from headache always have their own painkillers in their surroundings or with themselves, because of unpredictable headache occurrence and effect on working capacity and daily activity, despite being unaware of the pain but choosing the effective medication. Based on our clinical experience we think that probably the best question to identify migraine in the primary care is “Do you always carry painkillers with yourself?”.

Our proposed questionnaire differs from the questionnaires that were mentioned before, questions are not oriented to headache quality or leading symptoms. First question helps to find out that the headache has migraine feature of attacks. The second question is oriented to the impact of daily activity. The third question helps to find out if the headache is unpredictable and attacks can occur at any time. Definitely our questionnaire has some limitations. Although the study showed good sensitivity and specificity for diagnosing migraine, our questionnaire is not created to differentiate type of migraine. In addition, usage of headache clinical features in the KAMST induce a risk of false positive diagnosis. But we suggest our questionnaire as a screening tool for early detection of migraine in primary care. KAMST helps to suspect migraine, to refer those patients for neurologists who would make diagnosis according to ICHD-3 criteria. As well early detection of migraine prevents from its chronification and switch to medication overuse headache and following consequences.

To conclude KAMST questionnaire of migraine is reliable and valid method for patients’ screening but has some limitations.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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