Role of educational programs in management of patients with medication-overuse headache

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Patients with primary headaches are prone to frequent uncontrolled use of analgesics, leading to medication-overuse headache (MOH). One of the most accessible and effective strategies for its prevention is informing patients about the potential danger of its development. For this, training programs («schools») are conducted.

Objective: *to evaluate the effectiveness of educational programs in management of patients with MOH and its prevention.*

Patients and methods. *We included 120 patients (12 men and 108 women, mean age: men – 46.3±3.54 years, women – 41.3±9.5 years) with primary headache and MOH. The follow-up period was 12 months. First, patients were divided into two groups depending on the clinical diagnosis: group I (n=44) – patients with chronic primary headaches without MOH, group II (n=76) – patients with chronic primary headaches and MOH. Then, patients in each group were randomized into subgroups depending on the prescribed therapy. All participants underwent repeated clinical examinations and questionnaires assessment at 1-, 3- and 12-months follow-ups. In addition, all patients kept a headache diary. An educational «school» developed for this study was held in those subgroups where educational programs were specified.*

Results and discussion. *We observed a significant decrease in mean Headache-Attributed Lost Time (HALT) and Headache Impact Test (HIT-6) scores (p<0,05) at 12-months follow-up in subgroups where headache educational programs were combined with drug therapy, compared to the subgroups without educational programs. At the end of follow-up, we found a mean 1.75-fold increase in patients' treatment satisfaction (compared to baseline) in the subgroups where the «school» was held. Financial costs during the 12-month follow-up period for patients decreased by seven times because most patients stopped taking medications to relieve headaches.*

Conclusion. *Information and educational programs are an integral part of the management of patients with MOH.*

Keywords: *chronic primary headache; migraine; tension type headache; medication-overuse headache; educational programs in management of patients with chronic headache.*

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About 1–4% of the adult population has chronic migraine [1,2], about 2.2% of the adult population has chronic tension-type headache (TTH) [3]. Approximately 25–50% of those cases result in medication-overuse headache. Around 1% of population has MOH [4]. MOH of the patients with migraine and TTH is an independent cause of severe maladjustment [5]. The management of patients with MOH is a difficult task due to the lack of developed clinical guidelines, randomized clinical trials (RCTs) of the effectiveness of pharmacotherapy and a high rate of relapses (even with effective treatment) [6]. In the complex of current therapeutic approaches, discontinuation or limitation of symptomatic agents for headache relief and preventive pharmacotherapy are generally accepted strategies. Meanwhile, clinical observations demonstrate that patients with MOH usually have chronic daily headache pattern in close association with comorbid mental disorders of the anxiety-depression spectrum [7], which sometimes requires correction. High frequency of analgesics abuse and poor adherence to preventive therapy are typical trends of the disease course. All this in general requires constant monitoring of patients, use of behavioral strategies in order to increase their responsibility for the treatment results. From this perspective the development of educational programs aimed at increasing patient awareness on: the causes and patterns of the disease development and the priority behavioral and therapeutic strategies (and their role in the long-term prognosis of the disease) is of particular importance.

There are various modern non-pharmacological strategies for management of patients with MOH. These strategies consist of several components:

1. Cognitive-behavioral component aimed at changing the behavior and beliefs associated with headache (including cognitive-behavioral therapy / stress management therapy, training on trigger management).
2. Education aimed at increasing the skills and knowledge of the patients and enabling them to use these skills in various aspects of their lives besides medical intervention.
3. Methods based on mindfulness which help the patients to self-regulate their attention by increasing awareness and acceptance of thoughts, feelings and physical sensations.
4. Relaxation training aimed at increasing patients' control over physiological reactions in response to headaches, reducing sympathetic arousal and reducing stress and anxiety.

The aim of this study is to assess the effectiveness of educational programs in the management of patients with MOH and relapse prevention.

Materials and methods. The study involved 120 patients with primary headaches and MOH. At the beginning of the study we conducted a survey and clinical, neurological and neuro-orthopedic examinations. We divided the patients into 2 groups, depending on their diagnosis: group I (n=44) – patients with chronic forms of primary headaches without MOH; group II (n=76) – patients with chronic forms of primary headaches and MOH. Then in each group the patients were randomized into subgroups. Group I (patients with chronic forms of primary headaches) was subdivided into: subgroup A (n=18) (patients who had only conventional preventive therapy regimens); subgroup B (n=26) (patients who received generally accepted preventive therapy regimens in combination with educational programs). Group II (patients with chronic forms of primary headaches and MOH) was subdivided into subgroups: subgroup A (n=20) (patients who received only the generally accepted preventive therapy regimen); subgroup B (n=29) (patients who received conventional preventive therapy in combination with training programs); subgroup C (n=27) (patients who received detoxification therapy in combination with conventional preventive therapy and training programs).

The inclusion criteria were: written consent of the patient to participate in the study; age from 18 to 60 years old; established diagnosis (chronic TTH, chronic migraine, headache caused by excessive use of simple and combined analgesics, triptans and ergotamines).

Further, we assessed emotional and personal traits of the patients using the questionnaire of the severity of psychopathological symptoms Scl-90-r (Symptom checklist-90-revised). We assessed the effect of headache according to the following criteria: the visual analogue scale (VAS) was used to assess the headache intensity; the Headache-attributed lost time (HALT) and Headache Impact Test 6 (HIT-6) questionnaires were used to assess the impact on the quality of life, ability to work and daily activity of the patients. Analgesics taken by the respondents were divided into pharmacological groups and compared in terms of the frequency of use. It is important to take into account that some patients took several groups of analgesic drugs at once. The financial costs of drugs were assessed at the start of the study and 12 months later.

We observed 120 patients (12 men and 108 women, mean age among men – 46.3±3.54 years, among women – 41.3±9.5 years) with primary headaches and MOH for 12 months. About 57% of patients had higher education; the other had secondary education; 63% of the patients were employed at the time of the study. All patients had a long duration of the disease: men – 24.6±5.5 years, women – 13.5±4.5 years. The average intensity of headache according to the VAS was the following: among men 6–8 points, among women – 5–7 points. The number of days with headache per month was the following: among men – 15.5±3.5 days, among women – 19.3±4.5 days.

The majority of patients with MOH had two types of primary headache (TTH and migraine). We also revealed that the patients with migraine had more MOH than the patients with TTH only. Given the high comorbidity of MOH, we also analyzed the data on concomitant diseases: 50% of the patients had pain syndromes in the back in the remission stage, 35% had hypertensive disease and 10% had chronic gastritis in remission. One patient had Parkinson's disease.

We observed the patients in dynamics: repeated examinations and questioning after 1, 3 and 12 months. The patients also kept a headache diary. In those subgroups where the use of training programs was envisaged, the School (specifically developed for this study) was held. One session of the School was attended by 120 patients, 2 lessons – by 85 patients, 3 lessons – by 65 patients and 4 lessons – by 44 patients.

Content of the training program for patients with medication-overuse headache. The training program consisted of a series of sessions divided into modules. The duration of one session was from 40 to 60 minutes plus 15–20 minutes for discussion. The development of these modules was based on the results of a preliminary survey of patients who answered questions regarding the need to obtain various types of information about the nature, clinical implications, treatment methods and consequences of various forms of headaches.

Module 1. Introduction: main types of headaches, causes, diagnosis, prevalence and pathophysiology of headaches. This module contained information on the causes of headache, common and rare types of headache, pathophysiological mechanisms, clinical picture and variants of the course of primary headaches. Patients received information about the nature, risk factors, priority diagnostic methods and treatment options for primary headaches.

Module 2. Migraine: main types, aetiology, pathogenesis, clinical manifestations, stages of a migraine attack, rare forms of migraine, complications of migraine, modern methods of treatment. Patients received information about the types of migraine, phases of a migraine attack, ways of relieving a migraine attack, complications and rare forms of migraine, migraine aura and its types.

Module 3. Medication-overuse headache. The patients received information on MOH, causes of this type of headache, risk factors and treatment methods. Discussions included ways of cancelling the triggering drug, withdrawal syndrome, disease prognosis and the appropriateness of simultaneous withdrawal of an analgesic.

Module 4. Treatment options for headaches. Pharmacological methods of headache treatment – mechanisms of drug action, their effects and correct use, preventive therapy. Non-pharmacological treatments for headache. Lifestyle and headache. The patients received information about modern drug therapy for headaches, the mechanisms of action of drugs, effectiveness of drugs and their correct use. They also received information on the preventive treatment of headache and effective non-drug methods of treatment. Particular attention was paid to changes in the patients' lifestyle (diet, work, rest and sleep) in connection with the disease and improvement of health in general.

Methods of statistical analysis. We used the methods of descriptive and comparative statistics. When analyzing quantitative variables, we calculated the arithmetic mean (M), standard deviation, mean-squared deviation (σ) and minimum and maximum values. For the analysis of qualitative variables, the frequency and proportion (in %) of the total number was used. Statistical analysis was performed using the SPSS 11.5

Table 1. *Frequency of various types of analgesics administration in the studied subgroups, %*

Index	Subgroups				
	IA (n=18)	IB (n=26)	IIA (n=20)	IIB (n=29)	IIC (n=27)
Non-steroidal anti-inflammatory drugs	29	38	28	25	31
Triptans	48	51	64	65	69
Combined drugs	39	44	49	46	45

statistical software for Windows. Also, we used SPSS to calculate the exact p-values and significant differences in arithmetic means.

Study results. Analysis of the average intensity of headache showed that the patients were initially characterized by a sufficiently high maximum intensity of pain attacks (group I – 5.62±0.42 points according to VAS, group II – 6.04±0.48 points according to VAS). During the follow-up, a decrease in this indicator was noted. After 12 months of therapy, the average pain intensity decreased and amounted to 3.20±0.23 points in group I, and 3.97±0.42 points in group II ($p<0.001$). In the subgroups members of which attended the School, there was a decrease in pain intensity after 12 months, which was 2.20±0.25 points in subgroup I B, 2.95±0.42 points in subgroup II B, 2.83±0.33 points in subgroup II C ($p<0.001$).

The study compared groups in terms of the frequency of taking different types of analgesic drugs (Table 1). It should be noted that some patients were taking several groups of analgesic drugs simultaneously.

As can be seen from the table, we compared the groups by the frequency of taking different drugs.

We analyzed the patients' expenditures on headache drugs. Figure 1 shows the dynamics of expenditures at the start of the study and after 12 months of observation.

The number of participants who stopped spending money on headache drugs increased 7-fold (at the beginning of the study – 6.7%, after 12 months – 46.7%). At the beginning of the study, 13.3% of the participants spent more than 10,000 RUB/month, after 12 months the expenses decreased 4 times (3.3%). At the beginning of the study, 16.7% of the participants spent from 5,000 to 9,999 RUB/month, after 12 months – 6.7%. At the beginning of the study, 16.7% of the participants spent from 1,000 to 4,999 RUB/month, after 12 months – 10%. There was no difference in expenses in the range of 500 to 999 RUB/month at the beginning of the study and after12 months (13.3%). At the beginning of the study, 33.3% of the participants spent from 10 to 499 RUB/month, after 12 months – 20%.

The research found that the financial costs after 12 months of observation significantly decreased. This was due to the fact that most patients stopped taking their headache medications. For example, the average consumption of analgesics by the 12th month of observation decreased from 29 to 5.6 therapeutic doses. A survey of patients showed that in most cases (41.1%) the patients received recommendations to take headache medications from a neurologist and about 17.9% of the patients – from a a general practitioner. Equal proportions of the patients (11.7%) received information from their friends and from advertisements, and 17.6% of the patients – from the other sources.

In assessing the impact of headache on the quality of life and ability to work, according to the HALT questionnaire, at the beginning of the study the average value of the index in all groups was 22, which indicates as a strong influence of headache on the quality of life. A control survey after 12 months showed that the minimal decrease in the index was observed in the subgroups the members of which did not attend the School. In the subgroups where the patients received educational information, the HALT index of disability due to headache decreased statistically significantly: in subgroup I B by 39.3%, in subgroup II B by 37.6%, and the greatest decrease was noted in subgroup II C – 44.7%, compared with the baseline scores (Table 2).

Thus, all groups showed a significant decrease in working capacity due to chronic headaches according to the HALT questionnaire. The study showed that in the subgroups in which the patients received educational information, the HALT index of work disability due to headache significantly decreased 3 months after the beginning of the study – by 37.52%. It was also noted that after 1 month there was a downward trend of 20.82%. A decrease in the subgroups without training programs was 10.53%.

Evaluation of the impact of headache on daily activities based on the HIT-6 questionnaire at the beginning of the study was the following: subgroup IA – 58,83; subgroup IB – 65.62; subgroup IIA – 66.62; subgroup IIB – 64.52; subgroup IIC – 67.33. After 12 months, the indicators in the subgroups were the following: subgroup IA – 57.89; subgroup IB – 54.32; subgroup

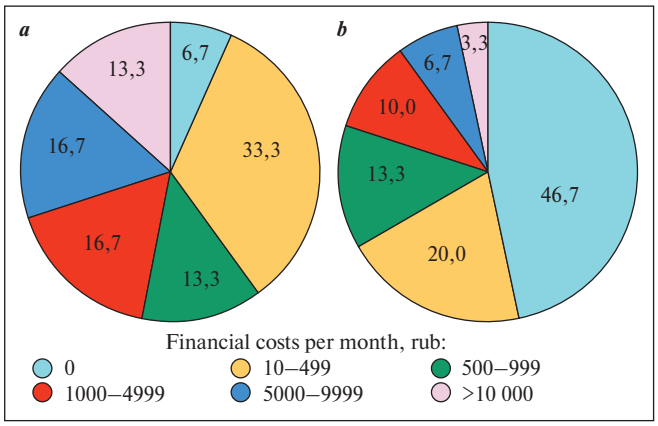

Fig. 1. *Financial costs of medications to relieve headaches at baseline (a) and 12-months follow-up (b), %*

Table 2. *Assessment of the impact of headache on the quality of life using HALT at baseline and 12-months follow-up, M±σ*

Index	Subgroups				
	IA (n=18)	IB (n=26)	IIA (n=20)	IIB (n=29)	IIC (n=27)
HALT Index:					
at baseline	22,93±14,56	22,44±13,68	22,22±15,55	22,23±15,53	22,36±14,76
after 12 months	19,88±13,87	13,61±12,81	20,22±12,33	13,87±13,35	12,36±12,23
% decrease in HALT index	13,3	39,3	9	37,6	44,7
p	<0,05	>0,05	<0,05	>0,05	>0,05

IIA – 59.91; subgroup IIB – 56.53; subgroup IIC – 56.55. Thus, the effect of headache on the daily activity of patients decreased more in the subgroups where the patients attended the School (Fig. 2).

The result of subjective assessment of the effect of treatment in the subgroups at the beginning of the study on average was the following: unsatisfactory – 23.24%, satisfactory – 44.82%, good – 23%, excellent – 4%. After 12 months, the subjective assessment of the treatment effect in the studied subgroups demonstrated a positive trend and on average was the following: unsatisfactory – 13.2%, satisfactory – 42.9%, good – 30.6%, excellent – 10% (Fig. 3).

Analysis of the data showed that patient satisfaction with treatment increased (compared with the baseline), and patients already rated the effect of treatment as «good» and «excellent» after 12 months, on average 1.75 times more frequently in the subgroups where the School was held.

Discussion. MOH is the most severe form of chronic daily headache, which is caused by excessive use of drugs to relieve headache attacks [8–12].

One of the most accessible and effective strategies for prevention of MOH is to inform the patients about the potential danger of its development. For this purpose, training programs are held.

This study evaluated the effectiveness of training programs in the treatment of headache in patients with primary headaches and MOH. The results of this study showed that training programs are more effective in reducing pain intensity, improving quality of life and reducing the consumption of pain medications than conventional treatment. This conclusion was also reached in 2017 in the study by K. Probyn et al. [13]. They analyzed 16 studies of pain management through non-pharmacological interventions and educational programs and compared the effectiveness of these interventions and traditional treatment.

Our study has a separate block with information on lifestyle modification in patients with headaches. Primary care physicians should educate the patients with migraines and tension-type headaches about lifestyle changes. The same conclusion was reached by J. Robblee et al. [14] in 2019. They published an article on the impact of lifestyle on migraines and demonstrated the reasonability of following the recommendations for lifestyle changes by the patients. The authors concluded that physicians should inform patients on the importance of maintaining the correct sleep-wake rhythm, physical exercise, nutrition, on the effect of stress, on the importance of keeping a headache diary and on limiting the consumption of pain medications [14].

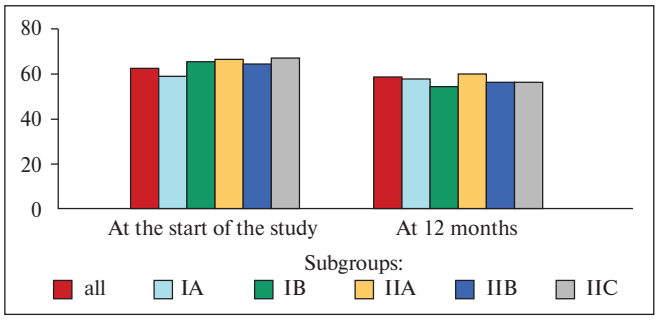

Fig. 2. *Comparison of the impact of headache on daily activity (according to HIT-6) in the studied subgroups at baseline and 12-months follow-up*

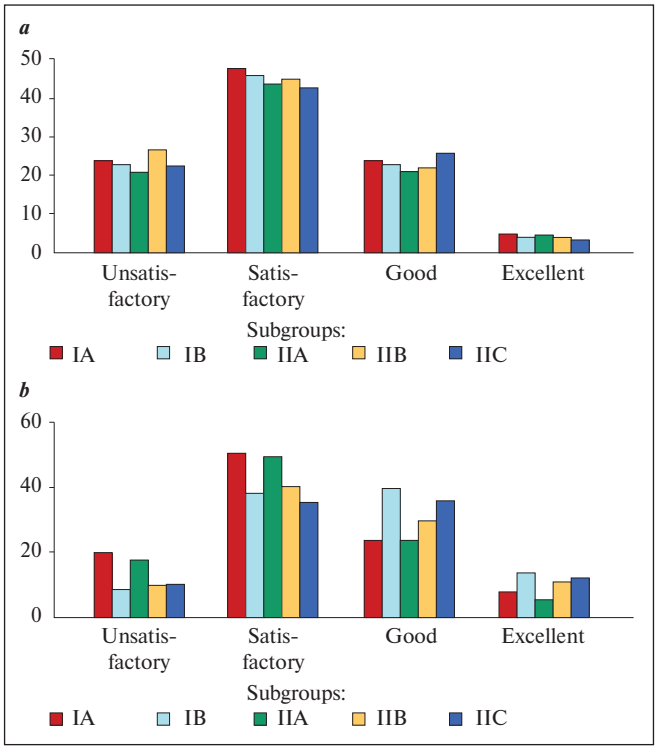

Fig. 3. *Comparison of subjective treatment effectivity assessment at baseline (a) and 12-months follow-up (b)*

Our study showed that the School participants were better able to change their lifestyle. This made it possible to reduce the intensity of headache, which is consistent with the data obtained by F. Faizi et al. [15]. They studied the effect of lifestyle education on headache reduction. The results of the study showed that lifestyle education helped the patients reduce headaches and related symptoms through lifestyle changes. For example, the average VAS score decreased to 5.20±2.3 compared with the baseline (7.50±1.9, $p<0.001$). The authors recommended further research with more active use of currently available communication tools and social media in order to make the research more applicable [15].

The psychological profile of patients with MOH is not fully studied at the moment, but the relationship between primary headache and personality has been the subject of interest for many years [19–25]. In our study, information on the effectiveness of psychological methods of treating headaches is highlighted in detail, which is consistent with the data of other authors. A 2019 meta-analysis of 12,773 identified articles found 27 randomized clinical trials on the effectiveness of psychological treatments for primary headaches. The authors found that psychological therapies are effective for headache itself, and not just for eliminating the psychological stress accompanying the headache [16].

Currently, there is no established unified therapeutic approach to management of patients with MOH. The need for detoxification therapy and preventive treatment remains a matter of debate. Most experts believe that the basis of patient management is the abolition of drugs that cause MOH. There are many options for detoxification therapy, both inpatient and outpatient. Our results showed that combination of treatments (preventive therapy, detoxification and education programs) are most effective. These results are consistent with the study by P. Rossi et al. [17], who compared the effectiveness of educational programs among patients with MOH. They compared the effectiveness of various strategies: 1) isolated withdrawal of a frequently consumed drug; 2) drug therapy (preventive treatment) in combination with an educational program on an outpatient basis; 3) combined treatment (preventive therapy, detoxification and educational programs) in inpatient settings [17]. The main conclusion of our study was that the combination treatment (preventive therapy, detoxification and education programs) is more effective than other approaches.

A meta-analysis of 7 clinical trials involving 391 patients found no difference between drug withdrawal in inpatient and outpatient/ day hospital settings in terms of reducing the number of days with headache [18]. We also came to this conclusion after the research.

The most effective way to prevent overuse headaches is to educate patients on the appropriate use of pain relievers [11, 23, 26–28].

Thus, the results of our study demonstrate a higher efficiency of management of patients with MOH when using a patient education strategy. Education programs are an integral part of the comprehensive approach to managing patients with primary headaches and MOH. The main purposes of these education programs are to inform patients about the problem of headache, increase patients' compliance, establish a doctor-patient relationship, secure adherence to medical recommendations, inform about the potential danger of MOH development and teach to use pharmacological methods of headache treatment correctly.

Based on our research, it is assumed that information should be provided to the patient stepwise, over several sessions, since this allows the whole volume of material to be divided into parts for more effective apprehension by patients, and to give them tasks to consolidate the material and formulate possible questions. The structure of modules of education programs should include information on the problem of headache (main types of headache, aetiology, pathogenetic mechanisms, prognosis of the disease), on triggers and methods of trigger control, on modern drug therapies (modern drugs for headache, frequency of administration, stopping an attack), on non-pharmacological methods of treatment (the main benefits and harms of certain methods), on the necessity of lifestyle modification (sleep, smoking, alcohol, diet, travel, stress, etc.). It is necessary to provide in full details the need to monitor the analgesics taken to relieve headaches.

Taking into account a high risk of recurrence of MOH (45%), it should be noted that in the first year of withdrawal of excessive intake of drugs, prevention of MOH recurrence is very important. This also requires educating patients about the rules and restrictions of the use of analgesics. Analysis of the results of our study shows a high therapeutic and prophylactic effect of educational programs: improving clinical characteristics and preventing MOH.

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Conflict of Interest Statement

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