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Fatigue after Subarachnoid Haemorrhage: A Study of Patients with Good Clinical Outcome

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Summary. *Background.* Recent studies have shown that the prevalence of fatigue in patients after subarachnoid haemorrhage (SAH) is high. However, data on patients with good clinical outcome are still scarce, since in clinical practice, the condition of patients is usually judged by physical parameters and mental condition is rarely considered. Thus, we aimed to determine the risk factors and prevalence of chronic fatigue among SAH patients in Lithuania.

Material and methods. Patients with good clinical outcome (Glasgow outcome scale=5, no major paresis) who were diagnosed with SAH and treated at the Republican Vilnius University Hospital between January 2018 - January 2021 were studied at least 6 months after discharge from the hospital. Patients diagnosed with other medical conditions known to result in chronic fatigue were excluded. To evaluate fatigue symptoms, patients were asked to fill in the Lithuanian version of the Multidimensional Fatigue Inventory (MFI-20L) questionnaire. Analyses were performed using RStudio version 2022.02.1. Results were considered statistically significant at p value <0.05.

Results. Total of 30 patients participated in our study: 20 female (66.67%) and 10 male (33.33%), median age 47 years (range 29-68). The median duration between SAH and fatigue evaluation was 37.5 months (range 11-46). Mean MFI-20L scores on fatigue subscales were 0.59±0.27 for general, 0.57±0.27 for physical, 0.55±0.29 for mental fatigue, 0.55±0.29 for reduced activity, and 0.44±0.22 for reduced motivation subscales. There were no statistically significant mean differences of general fatigue score between different age (p=0.64) and sex (p=0.20) groups. Mean general fatigue score between patients who had vasospasm (p=0.21) or any complication (p=0.68) after SAH did not differ statistically significantly from those who had not. Mean general fatigue score was statistically significantly higher in patients with poorer condition on admission (defined as Hunt and Hess grade >2) (p=0.02) and in patients with a longer period after SAH (p=0.02).

Conclusions. Fatigue is pronounced in patients who survive SAH. This is most evident in those patients who had poorer clinical condition on admission and worsened over time. General and physical fatigue were the most pronounced types of fatigue in our study group.

Keywords: fatigue, subarachnoid haemorrhage, good clinical outcome, long-term effect, complications.

INTRODUCTION

Fatigue is defined as a feeling of decrease in one's physical or mental energy with limited efficiency in responding to stimuli [1]. These symptoms, if prolonged, can form a chronic fatigue syndrome that is characterized by persistent or recurrent physical and mental fatigue, sometimes with musculoskeletal pain, sleep disturbances, and subjective cognitive impairment of 6 months duration or longer [1]. Although the pathogenesis of the syndrome remains unclear, it is currently thought that it may be triggered by a combination of factors such as genetics, previous viral infections, psychological stress, autoinflammation and others [2]. Due to its impact on well-being and potential life-disabling features, chronic fatigue is most often seen as a separate diagnosis, but it may be associated with other dis-

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orders. Post-viral fatigue and fatigue due to neurological disorders is commonly found. The most severe fatigue is seen in patients with multiple sclerosis, poliomyelitis, Parkinson's disease, and poststroke.The pathogenesis of fatigue of the central nervous system is associated with metabolic and structural lesions in neural pathways connecting the limbic system, basal ganglia, thalamus, and higher cortical centre, causing an enhanced perception of effort and decreased endurance [3–5]. Mental health symptoms associated with neurological diseases can also be a cause of fatigue. Recently, much attention has been paid to chronic fatigue after subarachnoid haemorrhage as it turned out to be more common and disabling than previously thought. Currently, the mechanisms of fatigue after SAH are unknown, but it is assumed that delayed ischemia, hydrocephalus, and systematic autoinflammation may lead to altered activity of neurotransmitters and enzymes responsible for attention, arousal, and reaction to stimuli [4–8]. Furthermore, psychiatric conditions (anxiety, depression, posttraumatic stress disorder), which are extremely common after a neurologic event, may be a contributing factor to chronic fatigue syndrome [4, 6]. However, this is difficult to determine due to the lack of clinical practice in assessing the psychological status of patients after SAH, since patients are considered fully recovered when they achieve functional independence [4, 6]. The aim of this study was to determine the prevalence of fatigue in SAH patients with good outcome and identify the main predictors, since no similar research has been previously conducted in Lithuania.

MATERIALS AND METHODS

Methodology

We studied prospectively collected data on good outcomes in patients with SAH admitted to the Republican Vilnius University Hospital (RVUH) between January 2018 - January 2021, at least 6 months after discharge from the hospital. The study period was from November 2020 to March 2022. The diagnosis of SAH had to be confirmed by computed tomography (CT) scan. At the revisit, patients completed a mental health assessment questionnaire to evaluate fatigue symptoms while medical information was collected from medical records. The study was approved by the Lithuanian Bioethics Committee and informed consent was obtained from all patients.

Research sample and inclusion criteria

Patients aged 18-89 who were diagnosed with SAH and treated at the Neurosurgery department of the Republican Vilnius University Hospital at least 6 months before the start of the study were invited to participate. Other inclusion criteria consisted of SAH diagnosis based on CT scan, good clinical recovery (GOS=5), Glasgow Coma Scale (GCS) = 15, no major paresis (muscle weakness no less than Grade 4 on Medical Research Council Scale) of any limb and writing and reading skills in Lithuanian. Patients with diagnosed CNS and other conditions known to result in chronic fatigue (e.g., kidney failure, heart failure) were excluded from the study. After agreeing to participate and signing informed consent, patients were asked to fill in the Lithuanian adapted Multidimensional Fatigue Inventory (MFI-20L) questionnaire to evaluate the symptoms of fatigue. All questionnaires were encrypted to maintain patient confidentiality. Other necessary information about the clinical condition of patients was collected from medical files. Data collected: clinical diagnosis, comorbidities, age at the time of hospitalization, length of hospital stay, neurological condition at the time of admission and discharge, type of treatment, head and neck CT, CT angiography and cerebral angiography data, and course of the condition during the inpatient stay. Collected data were defined by the World Federation of Neurosurgical Societies (WFNS) scale, Hunt and Hess scale (HHS), and the presence of intracranial SAH complications (rebleeding, vasospasm and secondary ischaemia, hydrocephalus). A total of 30 patients were included in the study.

Measurement tool

The Multidimensional Fatigue Inventory (MFI), created in 1995 by Smets and colleagues, was originally intended to evaluate fatigue in oncology patients [9]. After testing in other clinical populations, this questionnaire is now widely used in a variety of studies to test fatigue in patients with a specific diagnosis, including acquired brain injuries, and in the general population [10, 11]. The Lithuanian version of the modified MFI was validated in the Lithuanian clinical setting in 2020 only for patients with coronary artery disease [10]. MFI is a 20-item self-report method that covers the following dimensions: general fatigue, physical fatigue, mental fatigue, reduced motivation, and reduced activity. Each subscale consists of four items with possible answers on a five-point Likert scale (1 = "yes, that is true"; 5 = "no, that is not true"). Fatigue score for a subscale is calculated as the sum of subscale item scores. Subscale scores can range from 4 to 20 each. Scores are then converted to a percentage according to a formula. Percentages can range from 0% to 100%. Higher percentages indicate higher levels of fatigue [12].

Statistical analysis

All analyses were performed using RStudio (Statistical Package – Rcmdr) version 2022.02.1 Build 461 for Microsoft Windows. Normal distribution was tested using the Shapiro-Wilk test as our test sample contained only 30 patients. Continuous variables that were normally distributed were presented as means and standard deviation. As for continuous variables that were not normally distributed, median and range were used. Frequencies and percentages were used to present categorical variables. Mean differences of continuous variables between the groups

were tested using independent samples t-test, assuming equal or not equal variances (that were tested using two variances F-test). The relationship between the two variables was performed using the Spearman correlation coefficient (for nonparametric variables) and Pearson's correlation coefficient (for parametric variables). We also used multiple linear regression to determine variables responsible for a higher general fatigue subscale score. The results were interpreted as statistically significant when the p-value <0.05.

Table 1. **Characteristics of patients after subarachnoid haemorrhage (n=30)**

Demographic characteristics	
Mean age in years at the time of aneurysmal rupture (range)	47 (29-68)
Female sex, n (%)	20 (66.67)
Duration of time between SAH and questionnaire filling in months, median (range)	37.5 (11-46)
WFNS on admission	
I, GCS=15, no major focal deficit, n (%)	15 (50.00)
II, GCS=14-13, no major focal deficit, n (%)	8 (26.67)
III, GCS=14-13, with the major focal deficit, n (%)	1 (3.33)
IV, GCS=12-7, with or without major focal deficit, n (%)	4 (13.33)
V, GCS=6-3, with or without major focal deficit, n (%)	2 (6.67)
HHS grade on admission	
I, Asymptomatic or mild headache, n (%)	3 (10.00)
II, Oculomotor palsy and/or moderate-severe headache, and/ or nuchal rigidity, n (%)	19 (63.33)
III, Drowsiness, confusion, mild focal deficit, n (%)	3 (10.00)
IV, Stupor, moderate – severe hemiparesis, n (%)	3 (10.00)
V, Deep coma, decerebrate rigidity, moribund, n (%)	2 (6.67)
Complications following SAH	
Vasospasm, secondary ischemia, n (%)	3 (10.00)
Hydrocephalus, n (%)	2 (6.67)
Rebleeding, n (%)	1 (3.33)
Vasospasm, secondary ischemia and hydrocephalus, n (%)	1 (3.33)
Treatment of SAH	
Endovascular, n (%)	13 (40.00)
Surgical, n (%)	14 (46.67)
Conservative, n (%)	3 (10.00)
Localisation of a ruptured aneurysm	
ICA, n (%)	1 (3.33)
PComA, n (%)	6 (20.00)
AChA, n (%)	1 (3.33)
PCA, n (%)	2 (6.67)
OA, n (%)	3 (10.00)
DACA, n (%)	2 (6.67)
AComA, n (%)	10 (33.33)
MCA, n (%)	2 (6.67)
SAH of unknown aetiology, n (%)	3 (10.00)
MFI-20L questionnaire scores	
General fatigue score ± SD	0.59±0.27
Physical fatigue score ± SD	0.57±0.27
Mental fatigue score ± SD	0.55±0.29
Reduced activity score ± SD	0.55±0.29
Reduced motivation score ± SD	0.44±0.22

n – patients count; SAH – subarachnoid haemorrhage; SD – standard deviation; WFNS – World Federation of Neurosurgical Societies; GCS – Glasgow Coma Scale; HHS – Hunt and Hess grading system; ICA – internal carotid artery; PComA – posterior communicating artery; AChA – anterior choroidal artery; PCA – posterior cerebral artery; OA – ophthalmic artery; DACA – distal anterior cerebral artery; AComA – anterior communicating artery; MCA – middle cerebral artery; MFI-20L – Multidimensional Fatigue Inventory, Lithuanian version.

Table 2. **General fatigue score relationship with demographic and clinical characteristics of patients after SAH**

Variable	n	Mean	SD	SE	t-value	p-value
Age						
47 (median)	17	0.61	0.28	0.07	0.47	0.64
>47	13	0.57	0.26	0.07		
Sex						
Male	10	0.51	0.28	0.06	1.3	0.20
Female	20	0.64	0.22	0.07		
Time after SAH						
37.5 (median)	15	0.48	0.25	0.06	-2.57	**0.02**
>37.5	15	0.71	0.24	0.06		
WFNS on admission						
Good grade, 2	23	0.55	0.28	0.06	-1.73	0.09
Poor grade, >2	7	0.74	0.17	0.06		
HHS on admission						
Good grade, 2	22	0.53	0.26	0.06	-2.40	**0.02**
Poor grade, >2	8	0.77	0.18	0.06		
Presence of complications						
No	23	0.61	0.25	0.05	0.42	0.68
Yes	7	0.53	0.32	0.12		
Presence of vasospasm						
No	26	0.58	0.27	0.05	-1.28	0.21
Yes	4	0.70	0.25	0.12		

SAH – subarachnoid haemorrhage; n – patients count; SD – standard deviation; SE – standard error; WFNS – World Federation of Neurosurgical Societies grade; HHS – Hunt and Hess grading system grade.

RESULTS

A total of 30 patients with good clinical outcome who were admitted to RVUH from January 2018 to January 2021 agreed to participate in our study. The median time between ictus and questionnaire filling was 37.5 months (range 29-68). The mean score of MFI-20L was highest in the general fatigue subscale (0.59±0.27) and lowest in the reduced motivation subscale (0.44±0.22). Scores of different subscales had a high positive correlation with general fatigue score and physical fatigue score being most closely connected (r (28)=0.748, p<0.001), followed by reduced activity (r (28)=0.743, p<0.001), reduced motivation (r (28)=0.704, p<0.001), and mental fatigue scores (r (28)=0.673, p<0.001). The characteristics and MFI-20L subscale scores of all 30 patients are displayed in Table 1. We tested associations between mean general fatigue MFI-20L scores and patients' demographic characteristics, clinical condition at admission, presence of complications, and the duration of time from the diagnosis of SAH to questionnaire filling. The results of the independent samples t-test between different groups are provided in Table 2. Patients with HHS grade >2 had higher mean general fatigue score as opposed to patients who had HHS score grade 2 (0.53 vs. 0.77, p=0.02). Longer duration after SAH was also associated with higher general fatigue scores with a mean of 0.48 in patients with a duration of 37.5 months and a mean of 0.71 in patients with a duration of >37.5 months after SAH (p=0.02). In addition, mean general fatigue scores were higher in younger patients, females, patients with WFNS grade >2 on admission, and patients who had experienced vasospasm, however, the mean differences were not statistically relevant (p-values 0.64, 0.20, 0.09, 0.21, respectively).

The grade of HHS, median age, and sex did not differ statistically significantly between patients who filled the questionnaire 37.5 months from ictus and >37.5 months from ictus (p=0.754, p=0.05318, p=0.7095, respectively). There was no relationship between higher HHS grades and longer duration between SAH and questionnaire filling ((r (28)=0.743, p<0.001)). Thus, the grade of HHS and duration after SAH seem to be two independent variables affecting general fatigue score. The score of the general fatigue subscale positively correlated with the grade of the H&H grading system (r=0.435, p=0.016). There was no statistically significant correlation between the scores of the general fatigue subscale and longer duration after SAH (r (28) = 0.288, p=0.122). Both HHS grade and duration after SAH were further included in multiple linear regression analysis to determine whether the HHS grade on admission and the time after SAH significantly predicted general fatigue score. The fitted model was: General Fatigue Score=0.0669+0.1079×HHS grade on admission +0.008×Time after SAH in months. Linear regression was statistically significant (F (2.27)=4.658, p=0.0182). It was found that both the HHS grade on admission (=0.1079, p=0.019) and the time after SAH (=0.008, p=0.049) in months significantly predicted general fatigue score in patients after SAH. However, the model explains only 20 to 25% of variances (R^2=0.257,

adjusted R^2=0.201) making it unfit to use in real-life clinical practice.

We also tested mean differences between the groups on other MFI-20L subscales, as shown in Table 2. Mean differences of fatigue scores in the group with a duration of 37.5 months were statistically significantly lower than those with a duration of >37.5 months after SAH only for the mental fatigue subscale (mean score 0.392 vs. 0.638, p=0.019), t-tests for other subscales failed to show a statistically significant relationship. The mean fatigue score in the group with HHS >2 was statistically significantly higher than in the group with HHS 2 for reduced activity, physical fatigue, and reduced motivation subscales (0.480 vs. 0.750, p=0.022; 0.491 vs. 0.797, p=0.004; 0.369 vs. 0.617, p=0.003; respectively). Additionally, fatigue scores were statistically significantly higher in the group with WFNS >2 as opposed to the group with WFNS 2 for reduced motivation and physical fatigue subscales (0.375 vs. 0.634, p=0.003; 0.514 vs. 0.768, p=0.025; respectively). No additional statistically significant differences between the groups have been observed.

DISCUSSION

Long-term fatigue following SAH

Our study suggests that patients who fully recover after SAH experience fatigue. Similar results were observed in other studies around the world, with fatigued patients reaching a percentage as high as 90% [4, 6, 13–15]. However, fatigue percentage depends on fatigue measurement tools used, the time after SAH when the fatigue was assessed, etc. In addition, patients with good clinical outcome (GOS=5) tend to have lower levels of fatigue [6, 13], but its prevalence after SAH varies greatly between different studies [4]. We have also concluded that general and physical fatigue are the most prominent. However, similar studies in the world showed that mental rather than physical fatigue is most pronounced in patients who survived SAH [13, 15]. Interestingly, in our study, we have failed to show a similar relationship. In addition, the correlation between the mental fatigue subscale and general fatigue subscale was the lowest in comparison with other subscales, and higher mental fatigue scores were not associated with poorer clinical condition as opposed to other subscales. The MFI-20L Mental Fatigue Subscale questions are mainly based on questions that assess how difficult it is to concentrate and maintain concentration, including: “I can concentrate well when I do something”, “I can concentrate well”, “I need a lot of effort to concentrate”, and “My mind easily drifts” [12]. Whereas other studies have used the Mental Fatigue Severity Scale (MFS) or the Dutch Multifactor Fatigue Scale (DMFS) to assess mental fatigue [13, 15]. The MFS questions include those assessing concentration difficulties, slowness of thinking, fatigue and the need for rest after performing mental tasks, increased sensitivity to sensory stimuli, etc [16]. Unlike the MFI-20L, the MFS evaluates not only concentration difficulties but also fatigue after performing certain mental tasks, such as reading, taking part in a conversation with several people, etc. As the scale assesses a variety of different mental fatigue aspects, it is likely that the sensitivity of the scale for detecting such fatigue is higher than that of the MFI-20L, hence, the degree of mental fatigue in our studied patients may be underestimated. As for the DMFS, similarly to the MFS, the scale assesses how the performance of certain mental tasks impacts the sensation of fatigue and its effects on impeding mental performance [17]. In this way, both the MFS and DMFS are superior to the MFI-20L in detecting mental fatigue. Better tools to evaluate mental fatigue in the Lithuanian population should be developed.

Correlates of post-SAH fatigue

Our study has shown that general fatigue is related to the severity of SAH (clinical condition on admission) and duration after SAH. The poorer the condition on admission and the longer the time after SAH, the more severe fatigue symptoms. We were able to compose a statistically relevant linear regression model to predict the severity of general fatigue after SAH. However, the fitted model explains only a small number of variations of the general fatigue subscale score and is likely unfit to use in clinical practice to inform patients with SAH about the likelihood of post-SAH fatigue development. Nevertheless, it emphasises the importance of these two variables in the development of post-SAH fatigue. On the other hand, fatigue in our study did not depend on the age, sex, and presence of any complications. Although the mean general fatigue score was higher in patients diagnosed with vasospasm, we also were unable to demonstrate any statistically significant relationship. The demonstrated statistical insignificance may be the result of a relatively small sample size (only 4 patients diagnosed with vasospasm were included in our study). Other SAH studies have also attempted to determine factors influencing the development of fatigue after SAH [6, 7, 15, 18–21]. Similarly, some of them found poorer clinical condition on admission to be associated with higher levels of fatigue later [7, 19]. However, in a recent study of patients with good clinical outcome no association was found between patients admitted with poor clinical condition (HHS >3) and good clinical condition (HHS 3) [15]. A good grade in this study was defined as HHS 1-3, whereas in our study we defined a good grade as HHS 1-2; this may be one of the reasons for the discrepancy. It is possible that an HHS grade above 2 is severe enough to cause long-lasting fatigue. According to the literature, the presence of vasospasm, nicotine use [7], low physical fitness [18], cognitive and emotional impairment [6, 21], absence of the minor allele of corticotropin-releasing hormone receptor 1 (a key mediator to stress response) [20] are also associated with post-SAH fatigue. Therefore, it is likely that both personal and disease-specific variables can influence the development of fatigue.

MFI-20L cut-off score

As previously mentioned, our study found that a higher degree of fatigue after SAH was associated with a longer time duration after SAH and poorer clinical condition on admission. We have also determined that SAH patients with a good outcome have an average score of 0.59 on the general fatigue subscale, with patients who were in good clinical condition on admission averaging 0.53 and those in poor condition averaging 0.77. However, the clinical value of these findings is somewhat uncertain. This is because the normative data for the MFI-20L were not proposed by the authors, and although the MFI-20L was validated for Lithuanian patients with coronary artery (unfortunately, not for patients with neurological disease), the authors have not provided any cut-off values to determine the "normal" level of fatigue [10, 12]. To our knowledge, no additional studies have been conducted in Lithuania to establish the distribution and variances of the MFI-20L subscale scores between different sex and age groups of the Lithuanian general population. However, such studies have been previously conducted in Germany, and it was found that MFI-20 scores differ between different age and sex groups, with females and older people scoring higher, thus, a table of percentiles for different sex and age groups has been defined [22]. In a more recent study, the 75th percentile was chosen as a cut-off score for mild to moderate fatigue and the 90th percentile for severe fatigue [23]. The numbers in the 75th percentile for the general fatigue subscale range from 0.25 to 0.56 in men and from 0.38 to 0.56 in women [22]. As for the 90th percentile, the numbers range from 0.44 to 0.69 in men and from 0.5 to 0.75 in women [22]. Thus, we can argue that fatigue is pronounced in our study group, since the mean score of patients in good clinical condition in the admission group matches the upper limits of mild-moderate fatigue normative, and the mean score of patients in poor clinical condition in the admission group matches the upper limits of severe fatigue normative. The problem is that the normative data for the population of Lithuania may differ substantially from the data for the population of Germany. Therefore, we were not able to assuredly conclude the percentage of patients with fatigue in our study. More high-quality studies are needed: firstly, to define normative MFI-20L scores for the Lithuanian general population and, secondly, to validate the use of the MFI-20L for patients with brain injuries as it is already done in France [11].

Limitations

Small sample size was one of the biggest limitations of our study. The MFI-20L was only validated for coronary artery disease patients, thus its use in neurological settings may be limited. Other studies have also concluded that post-SAH fatigue is highly related to cognitive impairment, emotional problems such as depression and anxiety, and coping mechanisms; however, these factors were not evaluated in our study. Our study might be also influenced by volunteer bias as patients with higher fatigue might be less willing to participate in our study (mental and physical energy needed to come to the research centre and participate in the study).

CONCLUSIONS

Fatigue is pronounced in patients who survived SAH, even in fully recovered patients. This appears to be most evident in those patients who had a poorer clinical condition on admission (expressed as HHS grade) and it worsened over time. In our study group, general and physical fatigue were the most pronounced. The inability to show mental fatigue as the one most perceptible in SAH patients, as demonstrated in other studies, may be associated with low sensitivity of the MFI-20L to detect mental fatigue. Better tools are needed to evaluate fatigue, especially mental, in the Lithuanian population. More high-quality studies are needed to validate fatigue assessment tools for patients with neurological diseases. Normative data of these tools should also be determined in the Lithuanian general population.

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NUOVARGIS PO SUBARACHNOIDINĖS HEMORAGIJOS: GEROS KLINIKINĖS IŠEITIES PACIENTŲ TYRIMAS

Santrauka

Įvadas. Naujausi tyrimai rodo aukštą nuovargio paplitimą tarp pacientų, patyrusių subarachnoidinę hemoragiją (SAH). Labiausiai trūksta duomenų apie geros išeities pacientų patiriamą nuovargį, nes klinikinėje praktikoje pacientų būklė dažniausiai nustatoma, vertinant fizinius parametrus, o į psichikos būseną nėra atsižvelgiama. Šio tyrimo tikslas – nustatyti lėtinio nuovargio rizikos veiksnius ir paplitimą tarp SAH pacientų Lietuvoje.

Tiriamieji ir tyrimo metodai. Geros klinikinės išeities pacientai (Glazgo išeičių skalė = 5, be didelių parezių), kurie buvo gydyti Respublikinėje Vilniaus universitetinėje ligoninėje nuo 2018 m. sausio iki 2021 m. sausio, dėl SAH buvo įtraukti į tyrimą ir įvertinti mažiausiai 6 mėnesius po įvykio. Pacientai, kuriems buvo diagnozuota kita liga, galinti sukelti lėtinį nuovargį, nebuvo įtraukti. Įtrauktų pacientų nuovargis vertintas lietuviška daugiamačio nuovargio inventoriaus versija (MFL-20L). Statistinė analizė atlikta „RStudio“ programa (2022-02-01 versija). Skirtumas laikytas statistiškai reikšmingu, kai $p < 0,05$.

Rezultatai. Įtraukta 30 pacientų: 20 moterų (66,67 %) ir 10 vyrų (33,33 %). Amžiaus mediana buvo 47 metai (intervalas – 29–68 metai). Pacientų įvertinimo po SAH mediana buvo 37,5 mėnesio (intervalas – 11–46 mėnesiai). Vidutiniai MFL-20L įverčiai buvo: 0,59 ± 0,27 – bendro nuovargio, 0,57 ± 0,27 – fizinio nuovargio, 0,55 ± 0,29 – protinio nuovargio, 0,55 ± 0,29 – sumažėjusio aktyvumo ir 0,44 ± 0,22 – sumažėjusios motyvacijos subskalėse. Bendro nuovargio skalės vidutiniai įverčiai statistiškai reikšmingai nesiskyrė tarp skirtingų amžiaus ($p = 0,64$) ir lyties ($p = 0,20$) grupių. Statistiškai reikšmingo vidurkių skirtumo nebuvo ir tarp žmonių, kurie ligos eigoje patyrė vazospazmą ($p = 0,21$) ar kitų komplikacijų ($p = 0,68$), nuo tų, kurie nepatyrė. Vidutinis bendro nuovargio subskalės įvertis buvo statistiškai reikšmingai didesnis tų pacientų, kurie į ligoninę pateko sunkesnės būklės (Hunto ir Heso skalės įvertis – >2) ($p = 0,02$) ir praėjus ilgesniam laikui po SAH ($p = 0,02$).

Išvados. Nuovargis yra dažnas reiškinys po SAH. Sunkiausią nuovargį patiria tie pacientai, kurie į ligoninę patenka sunkesnės klinikinės būklės. Nuovargis, laikui bėgant, stiprėja. Mūsų tyrimų metu stipriausias buvo bendras ir fizinis nuovargis.

Raktažodžiai: nuovargis, subarachnoidinė hemoragija, gera klinikinė išeitis, ilgalaikis poveikis, komplikacijos.

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