Dynamics of Sexual Activity of Men and Women of Different Ages, Undergoing Cerebral Stroke

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Abstract

Introduction: The issues of sexual activity of representatives of different sexes who have suffered a stroke are poorly covered in the literature. However, this problem has a distinct clinical significance.

Objective: Determination of the prevalence and clinical variability of sexual disorders in people of different sex and age at different times – before and after cerebral stroke, and the need to take into account sexual history in predicting the consequences of stroke and in treatment and rehabilitation measures

Materials and Methods: In the process of a targeted survey of 111 patients (58 men and 53 women) of different ages, conducted in the acute period of stroke, their sexual activity was studied in the pre – stroke period, and then in 77 of these patients-after 3-24 months. Sexual partners of the respondents were involved in the survey. The obtained data were compared with age, stroke background pathology, and stroke variant, severity of neurological deficit, cognitive and emotional disorders, and results of neuroimaging studies.

Results: The decrease in sexual activity before stroke is of clear importance along with age in the development of background pathology for stroke, the formation of the consequences of stroke in cognitive and emotional functions. At the age of 55 years the most severe functional consequences of stroke were formed in 8.3% of persons who had normal sexual relations before stroke and in 27.6% in the absence of such (p=0.09). The negative dynamics of sexual activity after stroke is associated with the presence and severity of neurological deficits, especially among women, and the presence of cerebral atrophic changes, more often in men.

Conclusion: The initial quality of intimate relationships largely determines the clinical features of stroke and its consequences, and the negative dynamics of sexual activity after stroke is associated with different causal factors in different sexes, and this must be taken into account in the process of rehabilitation treatment.

Keywords: Stroke; Age; Gender; Sexual activity; Rehabilitation

Sexual activity along with physical and intellectual occupy an important place in human life, and disorders in the sexual sphere, occurring in a number of cardiovascular diseases, can have a negative impact on the quality of life of patients and complicate the course of the pathological process. In addition, sexual disorders, developing against the background of aging, and in different diseases, are for many a strong stress factor, aggravating and accelerating the aging itself and has a negative impact on the development of diseases [1].

The number of publications on sexual disorders in persons with cardiovascular disease is low and the emphasis is on coronary heart disease (CHD) and the effects of myocardial infarction [2]. The vast majority of studies concern the male population and erectile dysfunction (ED), and sexual disorders in women with heart and vascular diseases are rarely discussed. Sexual disorders that occur in patients, who have suffered cerebral strokes, are devoted to individual messages, and they also mainly concern the male. It is pointed out, however, that women experience many different bodily changes as a result of a stroke, which negatively affect their sexual life in two ways: some of them reduce the women’s self-esteem; others physically limit the possibility of sexual activity [3]. The indicator of female sexuality in stroke patients is reduced, depression – increased, and disorders of sexual functions in women who have had a stroke, depend on the severity of the disease, the level of functional dependence and concomitant depression [4]. Published data that every second patient who had a stroke, there is sexual dysfunction, and this issue is often not solved by health professionals [5]. It is suggested that post-stroke sexual disorders are mainly associated with psychological rather than physiological causes [6,7]. It is claimed that sexual disorders in the majority preceded development of ischemic stroke or myocardial infarction much more often, than appeared after these cardiovascular catastrophes, and in this connection it was assumed that ED even is one of early symptoms of development of cerebrovascular diseases [2]. In a well-known study involving 60 men aged 38 to 79 years who had a stroke, the prevalence of sexual disorders was equal to 94.8% [8]. But the decrease in libido and the frequency of sexual acts were recorded in 70% of cases, erection disorders, ejaculation and orgasm – in 60%, and men with post-stroke ED were much older than without it.

There is discusses the question of the inclusion of the methods used in the field of sexology, in a program of rehabilitation

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The aim of the study

Study was to determine the prevalence and clinical variability of sexual disorders in representatives of different sexes and age in different periods of time – before and after cerebral stroke and the need to take into account sexual history in predicting the consequences of stroke and in treatment and rehabilitation measures.

Materials and methods

Studies were conducted in 111 patients of both sexes aged 18 to 88 years, who suffered acute cerebrovascular accident in the form of cerebral stroke. Of these, 58 were men aged 24 to 77 years (m=52.9 ± 11.8) and 53 were women aged 18 to 88 years (m=52.8 ± 12.4). Ischemic stroke underwent a total of 63 patients (32 men and 31 women), mean age of 57.9 ± 10.5 years, hemorrhagic – 48 (26 men and 22 women), mean age 47.7 ± 2.4 years. Among persons with hemorrhagic stroke, 25 (9 men and 16 women) were diagnosed with intracerebral hemorrhage, 23 (17 men and 6 women) with subarachnoid hemorrhage.

The diagnosis and clinical pathogenetic variant of stroke were confirmed by the results of neuroimaging studies – CT and/or MRT. In the course of the examination, methods of ultrasound scanning of brachiocephalic vessels, study of attention function using Schulte tables, the state of cognitive functions on the MMSE and MoCa scale, emotional state on the hospital scale of anxiety and depression were used. The functional outcome of the acute stroke period was assessed using the Rankine scale.

At the first stage, all patients were examined in a specialized hospital in the acute period of stroke, within 1 to 21 days after the manifestation of its first clinical manifestations. During 1 to 3 weeks after the manifestation of the first clinical manifestations of stroke and depending on the General condition of the patient and the possibility of productive communication with him in the process of collecting anamnesis, close attention was paid to obtaining information about sexual life in the preceding stroke period. All the participants were in a clear mind, adequately treated the topic of the conversation and could clearly answer the questions of an intimate nature. Subsequently, in the second stage of studies, in the period from 3 to 24 months (m=13.19 ± 6.08 months) after stroke, repeated control tests were performed in 77 (69.4%) patients determined by random sampling to determine the dynamics of sexual relations. In the process of examination and questioning of patients in order to obtain the most accurate and objective information about their intimate life, a targeted survey of their spouses and/or sexual partners was conducted, after which the data of such a survey were compared with those obtained from the patient himself. This minimized possible errors associated with illness, character and personal characteristics of the respondents. All studies were conducted with the informed consent of patients and their relatives.

Statistical processing of the results was carried out by methods of variation statistics using programs “Biostatistics” and MS Excel. For comparison of two independent groups on a quantitative basis the Student’s criterion is used. For comparisons of selected subgroups of patients among themselves for quantitative traits was used aparametrical analysis of variance for Kruskal-Wallace. In cases of revealing statistically significant differences between groups, additional analysis of multiple comparisons of Kruskal-Wallis Z was carried out to determine which groups were statistically significantly different from others. For comparison of groups on a qualitative basis the criterion χ-square was used. The differences were considered statistically significant at p<0.05.

The results of the study and their discussion

In the period immediately preceding the stroke, 78 (70.3%) people stated that they had normal sexual activity. In 33 (29.7%) patients prior to stroke intimate relations either did not exist at all for various reasons or they were very rare and were not accompanied by positive emotions, pleasure.

The absence, rarity and poor quality of sexual relations in the pre-stroke period were more often noted by women (n=18; 34.0%) than men (n=15; 25.9%). But a detailed examination of the reasons for the lack of sex found that 15 (83.3%) of the 18 women were widows for a long time and refused to seek sexual relations on the side both because of their “strict moral principles” and because of the decrease or lack of libido. At the same time, 14 (93.3%) of 15 men had ED prior to stroke, and only 1 (6.7%) had no sex life due to the death of his wife (OR=1.2, 95% CI 1.1–1.7, p<0.01).

In the division of patients by age, it was revealed that before the onset of stroke, men under 60 years (n=42) rarely presented cases of erectile dysfunction (n=4; 9.5%), whereas after 60 years (n=16) more than half of men (p=10; 62.5%) complained of the absence of a full-valuable erection. At the same time, in the period from 55 to 60 years only 2 (15.4%) of 13 men had sexual dysfunction.

In women, the beginning of a period of significant rarity or lack of sexual relations falls on a younger age than in men. Already at the age of 55-60 years, 7 (58.3%) out of 12 women had no sexual relations, at the age of 60 years – 9 (81.8%) out of 11. Thus, in the period preceding stroke, men aged 55-60 years were largely 3.8 times more sexually active than women of similar age (OR=3.5 (95% CI 1.1–11.3), p=0.021). Preservation of employment was of some importance for sexual activity. ED was 7.5 times more common in non-working men – 11 (57.9%) out of 19 compared to working men – 3 (7.7%) out of 39 (OR=7.5 (95% CI 2.4-23.8), p<0.0000). Among working women (n=42), the absence or sharp decrease in sexual activity was also quite rare in 3 (7.1%) cases (OR=2.5 (95% CI 1.2–5.6), p=0.017).
In cases of ischemic stroke problems in intimate life were present in 23 (36.5%) of 63 patients, hemorrhagic – in 10 (20.8%) of 48. But this was most likely due to age differences.

When considering the concomitant and background for stroke somatic pathology, a number of regularities are established (Table 1).

It turned out that functionally significant atherosclerosis of brachiocephalic vessels was observed 3.2 times more often in persons with problems in intimate relations (n=12; 36.4%) than with sexual activity preserved before stroke (n=9; 11.5%); OR=3.2 (95% CI 1.4–4.1), p=0.004. Also significantly more common among individuals with reduced sexual activity, or with a complete lack of intimate relations met other variants of the pathology, the background for the emergence of the stroke – coronary heart disease, heart rhythm abnormalities and diabetes mellitus. Only for arterial hypertension (AH) no statistically significant differences were found, although this pathology is still present more often among women with lack of sexual activity (Table 1). In a detailed targeted survey it turned out that it was often AG for our patients a kind of limiter of their sexual activities due to fear, anxiety, uncertainty, “harm” excessive emotional and physical stress.

Among men suffering from ED, functionally significant atherosclerosis of brachiocephalic vessels was detected in 6 (42.9%), among patients without ED – in 7 (16.3%); OR=2.9 (95% CI 1.2–6.8), p=0.033. In a combination of hypertension and significant atherosclerosis of brachiocephalic vessels in 20 men, ED was observed in 9 (45%) of them and was absent in 11 (55%); OR=2.1 (95% CI 1.0–4.3), OR=3.0 (95% CI 1.3–7.4), p=0.011. Half of the men (n=7; 50%) who suffered from ED were heavy smokers.

To a large extent, similar results were obtained in women.

The prevalence of significant atherosclerosis of brachiocephalic vessels in the absence of sexual relations in the period preceding the stroke was lower than in men with similar problems. But in relation to women who have retained sexual activity, it was higher by 3 times (Table 1); OR=3.0 (95% CI 1.7–5.4), p=0.014. The prevalence of combinations of hypertension and atherosclerosis of brachiocephalic vessels was 1.5 times higher (OR=1.5 (95% CI 1.1–2.2), p=0.022).

Of course, an increase in age could not less naturally affect the increase in the prevalence of a particular variant of the background for stroke pathology, as well as the decrease in sexual activity associated with this age. In the division of the observed patients into two categories – younger and older than 55 years, this pattern was confirmed - the relative number of persons with disorders of sexual activity and older than 55 years was approximately the same for all variants of the background for stroke pathology (Figure 1).

But in the division by sex, it turned out that only the presence of hypertension was acute for both the selected age groups of both men and women, this pathology was found in 18 (64.3%) men and 21 (70.0%) women under the age of 55 years and in 29 (96.7%) men and 22 (95.7%) women over 55 years. Other isolated variants of the background for stroke pathology were not found at all in women under the age of 55, although a small number of cases were registered among men of the same age: significant atherosclerosis of BCA and IHD – 2 (7.1%) cases, diabetes – 3 (10.7%). It can be assumed, therefore, that not only a decrease or complete absence of sexual activity has a negative impact in terms of the formation of a background for the stroke pathology. Probably still, the increase in age determines both the degree of prevalence of cardiovascular pathology, which is considered to be age-associated [1], and the decrease in sexual activity, including the increase in the prevalence of ED, which

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<th>Table 1: Background stroke is the somatic disease and sexual activity in the pre-stroke period.</th>
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<td>Significant atherosclerosis of the BCA (n=21; 18.9%)</td>
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<td>Arterial hypertension (n=90; 81.1%)</td>
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<td>Coronary heart disease (n=21; 18.9%)</td>
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<td>Heart rhythm disturbance (n=13; 11.7%)</td>
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<td>Sugar diabetes (n=15; 13.5%)</td>
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<th>Table 2: Variants of negative dynamics of sexual activity.</th>
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<td>Components of deterioration of sexual activity</td>
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<td>Libido</td>
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<td>Erection</td>
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<td>The sensation of orgasm</td>
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is often considered as a marker of developing cardiovascular system disorders in men [2].

The presence of problems with sexual activity, increasing in relation to the age of patients, left its mark on a number of functions studied in the acute period of stroke. So when carrying out a sample of Schulte on the state of attention of men who did not suffer from ED, showed results from 25 to 180 seconds, on average 57.5 ± 33.7 sec. In the presence of ED spent much more time – from 54 to 300 sec., an average of 132.2 ± 100.0 sec. (OR=3.8 (95% CI 1.1–2.1), p=0.018.

The indicators of cognitive deficits, determined in the acute period of stroke on the MMSE scale, were also more shifted to the pathological side in patients with problems in intimate relationships in the preceding stroke period. In men, in the absence of problems with erectile function, the average results were equal to 27.5 ± 4.7 points (from 4 to 30); OR=0.3 (95% CI 0.2–0.8), p=0.019.

When assessing the state of patients on the hospital scale of anxiety and depression in the acute period of stroke, no significant differences in the level of anxiety depending on the presence or absence of ED WERE revealed. Subclinical level of anxiety was determined in 7 (12.1%) out of 58 men, 5 (11.4%) out of 44 who did not have obvious sexual problems and 2 (14.3%) out of 14 who suffered from erectile dysfunction (p>0.05). At the same time, the subclinical level of depression was detected in 2 (4.5%) men without ed signs and in 2 (14.3%) who had sexual problems (OR=1.2 (95% CI 0.2–5.8) p<0.05). Among women, the sub-clinical level of anxiety was determined in 10 (18.9%) out of 53, 7 (20.0%) out of 35 who had sexual relations and 3 (16.7%) out of 18 who did not have such (p<0.05). Subclinical level of depression was found in 4 (11.4%) women who lived sexual life, and in 7 (38.9%) single women with no intimate relationships (OR=1.2 (95% CI 0.9–1.6), p<0.05).

Thus, the lack of full-fledged sexual relations in the previous stroke period, combined with an increase in age indicators has a negative impact on the function of attention, cognitive functions and the state of the emotional sphere in both sexes. At the same time, depression of the acute stroke period is recorded more often, 2.7 times, among women who did not have sexual relations than among men who suffered from ED. But still, it seems that in women the depression is associated more with the fear of possible loneliness upon reaching old age with post-stroke restriction of motor and other activity than with the lack of intimate relationships.

When assessing the functional outcome of an acute stroke period on the Rankine scale, it was found that men with ED are slightly more likely than those without sexual problems to have a coarser degree of functional impairment (mRs>3 points) – 4 (28.6%) and 4 (9.1%), respectively; OR=0.4 (95% CI 0.2–0.97), p=0.086. Of the 18 women with pre-stroke sexual inactivity, 5 (27.8%) also had a more severe degree of functional impairment (mRs>3 points). And all 35 women without problems in sexual sphere in 100% cases had a good functional outcome (mRs 0-2 points); OR=1.3 (95% CI 1.0–1.8), p=0.003.

The differences could also be largely attributed to the age of the patients and not only to their sexual activity. Therefore, in order to somehow clarify the influence of the factor of sexual attitudes on the functional outcomes of stroke, regardless of the age of the patients, the increase of which contributes to a decrease in sexual activity, all observations were divided into 2 groups depending on age. The 1st group included persons aged 40 to 55 years (n=48), the 2nd group – older than 55 years (n=53). Persons under 40 years of age were deliberately excluded from this part of the study due to the fact that in this age period sexual activity is usually the highest, which was confirmed by all 10 respondents of this age.

Among the representatives of the 1st group (n=48) normal sexual relations before stroke occurred in 44 (91.7%), were absent or were rare and “boring” - in 4 (8.3%). However, the most severe functional consequences of stroke (mRs=3 points on
the Rankine scale) were observed in 2 (4.5%) of 44 patients with preserved intimate relations before stroke and in 2 (50%) of 4 patients with problems in this regard (OR=0.9 (95% CI 0.2–0.5), p=0.03). Among 53 patients of the 2nd group - over the age of 55 years (n=53), 24 (45.3%) had sufficiently active sexual relations before stroke, 29 (54.7%) did not have or considered them defective. But the most severe functional consequences of stroke (mRs=3 points on the Rankine scale) were formed in 2 (8.3%) of 24 patients with the presence of normal intimate relations before stroke and in 8 (27.6%) of 29 patients with problems in the sexual sphere (OR=0.3 (95% CI 0.07–1.3), p=0.09). Thus, the presence and high quality or, conversely, the absence or low quality of intimacy in the period preceding the stroke was even more important for the completeness of the recovery of functions lost as a result of the stroke than only age criteria. It turns out that if the traditional risk factors for stroke and the severity of its consequences, including a number of cardiovascular diseases and an increase in age, add another decrease or lack of sexual activity in the pre-stroke period, the age value will clearly decrease, and hypo- or asexuality will act as a litmus test that determines the presence of cardiovascular risk factors for stroke and indicates a decrease in the prospects for successful functional recovery after it.

To identify the interdependence of structural brain damage and sexual activity, the presence or absence of problems with sexual activity in 63 patients with ischemic stroke was compared with the results of neuroimaging studies conducted in the acute period of stroke. There was no definite dependence of the predominant localization and size of the ischemic focus of stroke on sexual activity that took place in the period preceding the stroke. But very distinct differences in terms of sexual activity in representatives of different sexes are obtained depending on the presence or absence of cerebroal atrophy (Figure 2), detected in 43 (68.3%) of 63 cases, in 25 (58.1%) men and 18 (41.9%) women. Leykooareos of varying severity were determined in 30 (47.6%) patients, 17 (56.7%) male and 13 (43.3 per cent) women.

The results of the analysis showed high, up to 100%, the prevalence of atrophic changes of the brain, including leukoareos, among women who had sexual problems at the pre-stroke period. At the same time, similar atrophic changes in women with regular sex life were 4-5 times less frequent (OR=0.4 (95% CI 0.1–0.6), p<0.000). The prevalence of atrophic changes among men had virtually no connection with their sexual activity in the pre-stroke period (p>0.05). Since the detected atrophic changes were not a consequence of the incident, and a priori formed long before it, it can be argued that cerebral atrophy, ceteris paribus (age, the presence of a sexual partner, etc.) to a certain extent, “inhibits” the sexual activity of women, but does not affect such in men.

Among 48 patients with hemorrhagic strokes that occurred at a younger middle age than ischemic, similar atrophic changes in the structures of the brain were found much less frequently – only in 16 (33.3%) cases. In addition, the presence of intracerebral hemorrhagic foc (n=23) did not always allow the most reliable verification of previous stroke atrophic processes on CT/MRT. In this regard, the results of comparing this kind of rare pathological findings with variants of sexual activity would not be entirely correct.

At the second stage of studies in the control testing 77 patients (41 men and 36 women) showed deterioration of sexual function after stroke 36 (46.8%) of them, 10 (13%) - with complete sexual activity, 26 (33.8%) - with a decrease in the frequency and quality of intimate relationships. Taking into account the fact that among the 77 cases presented there were 20 (26.0%) people whose sexual relations for various reasons were almost completely absent in the pre-stroke period, the number of persons who did not have sexual relations after a stroke increased to 30 (39.0%). Men was 16 (39,0%) of the 41 women 14 (38,9%) of the 36. Sexual relations have been maintained to some extent in 47 (61.0%) patients, 25 (61.0%) men and 22 (61.1%) women. The overall percentage of persons with no sexual activity or problems in sex-governmental relations has increased, therefore, from 29.7% (n=33) during the period pre-stroke, to 72.7% (n=56) in post-stroke period (OR=3.9 (95% CI 2.1-7.0), p=0.0001). At the same time, the newly emerged problems in sexual relations (n=36) were slightly more frequent among patients with ischemic stroke - in 24 (50.0%) of 48 than hemorrhagic – in 12 (41.4%) of 29. Most likely, this is due to the younger age the patient who suffered a hemorrhagic stroke, compared with individuals with ischemic stroke, that, among 29 cases of hemorrhagic insult in 12 (41.4%) had subarachnoid hemorrhage, leaving behind a minimum of the functional defect.

The newly formed post-stroke sexual dysfunctions equally often concerned both sexes – 18 (50.0%) of men and women. But the qualitative indicators characterizing the state of sexual relations in 47 (61.0%) patients, in whom they were more or less preserved after a stroke, had distinct gender differences (Table 2).

Men as components of deterioration of sexual activity most often noted decrease in libido, decrease or periodic lack of an erection, decrease in brightness of an orgasm and the General sexual satisfaction. Women more often refused sex because of lack of libido, lack of feeling of brightness of an orgasm and the General satisfaction from sex. The frequency of intimate relationships decreased in 36 (76.6%) of the 47 patients, which in all cases was accompanied by a decrease in their quality; men were 21 (58.3%), women – 15 (41.7%); OR=1.2 (95%CI0.7–2.0), p=0.49. Only 1 (2.4%) of 41 men observed in the dynamics after a hemorrhagic stroke at the age of 42 years had some increase in sexual activity in the absence of signs of cognitive deficits, paroxysmal states of the epileptic circle and characteristic epileptic changes in bioelectric activity. This did not allow us to consider this phenomenon as a manifestation of post-stroke epilepsy [9,12-14]. The absence of concomitant urination and defecation disorders, manifestations of sexual hypertension in this case was contrary to the defeat of specific cortical centers involved in the regulation of sexual behavior. As a result, the frequency of sexual contacts in 25 patients (14 men and 11 women) was 1-2 times a week, in 22 (11 men and 11 women) – 1 time per month and less often, and this depended mainly on the
age and mutual desire of partners. In no case after the stroke was there any attempt to find another sexual partner, any novelty in the relationship, there was no masturbation, paraphilia, although often, twice as often in men as in women, there were erotic fantasies.

The differences in the affective and cognitive spheres of stroke patients, depending on the presence and severity of their sexual disorders, are very interesting. The increase in the prevalence of depressive disorders in the recovery period of stroke (n=25; 32.4%) in relation to acute (n=15; 13.5%) was clearly noticeable. But among 25 patients with subclinical and clinical depression, 11 (44.0%) had significant negative changes in sexual activity. These changes were clearly associated with stroke and experienced (OR=1.3 (95% CI 1.0–1.7), p=0.132). It is therefore possible that post-stroke sexual disorders still contribute to the formation of post-stroke depression, and it is necessary to pay attention to this in the examination of patients.

Also, no patient with severe sexual dysfunction and a complete lack of intimacy during the examination on the MMSE and MoCa scales showed a normal result. And in 11 (36.7%) of 30 patients with clearly negative dynamics of sexual activity, but with the preservation of reduced sexual capabilities, there were fairly pronounced cognitive impairment – 20.3±2.4 points on the MMSE scale and 19.1 ± 2.8 points on the MoCa scale (OR=1.5 (95% CI 1.2–2.1), p=0.09). Finally, patients with sexual disorders that occurred or increased after stroke showed low results in the study of attention on the Schulte scale (m=61.8 ± 19.3 sec.). The results of persons without distinct negative dynamics of sexual functions were significantly better (m=45.03±12.5 sec.); OR=2.7 (95% CI 1.3–5.9), p=0.017. And this is despite the fact that in general, the indicators of attention in the recovery period of stroke have improved compared to those registered in the acute period of stroke.

A slightly different picture was formed when comparing the motor and coordination disorders that existed after a stroke with sexual activity after a stroke. Of the 77 people examined in the remote period of stroke, 44 (57.1%) had minimal or no pyramidal symptoms, for example, in cases of former subarachnoid hemorrhage (n=12; 100%). Of these, 30 (68.2%) remained sexually active after stroke, although the changes in sexual activity described above were noticeable. Among the remaining 33 (42.8%) persons with visible pyramidal disorders, only 14 (42.4%) had regular sexual relations (OR=1.6 (95% CI 1.0–2.5), p=0.036) – in 7 men and 7 women, and in 3 (9.1%) they became isolated and accompanied by negative emotions. But in the isolation of these 33 patients 22 (66.7%) with the most distinct motor deficiency, it turned out that only 6 (27.3%) of them (5 men and 1 woman) after a stroke had acceptable sexual relations for them (OR=2.5 (95% CI 1.2–5.1), p=0.02). Thus, the presence and severity of pyramidal symptoms negatively affects the sexual activity of women (OR=1.7 (95% CI 1.1–2.8), p=0.006), but is not as important for men (OR=1.6 (95% CI 0.9–4.2), p=0.08).

Post-stroke ataxia was observed in 12 (15.6%) patients, of whom 10 (83.3%) had no sexual relations (OR=2.3 (95% CI 1.5–3.6), p=0.02) - 2 men (OR=1.1 (95% CI 0.9–1.3), p=0.1) and 8 women (OR=1.6 (95% CI 1.0–2.7), p=0.025). Thus, as well as the presence of pyramidal symptoms, the presence of post-stroke coordinating disorders negatively affects the sexual activity of women, but not men. The data obtained to some extent confirm the results of some studies [6], which showed that the presence and severity of neurological deficits did not have a significant effect on ED in men who had a stroke. But women do find themselves in a less “favorable” situation in terms of maintaining sexual activity in the presence of their motor and coordination disorders.

The data obtained by comparing the dynamics of sexual activity after stroke and the results of neuroimaging studies conducted in the acute period of stroke are interesting. The statistical analysis did not reveal a certain value of the predominant localization and size of the ischemic or hemorrhagic focus of stroke in terms of their relationship with the dynamics of sexual activity. This contradicts the results of a number of studies that show a certain value of localization of brain and spinal cord lesions in the development of sexual disorders – both reduction and increase of sexual activity [15-17] But certain connections are revealed when comparing the dynamics of sexual activity and the presence and severity of atrophic processes in the structures of the brain, combined with the presence of multiple small ischemic foci such as lacunar infarcts and lekyoareos. For example, among 36 individuals with negative dynamics of sexual activity atrophic changes were recorded in 19 (52.8%), lekyoareos – 14 (38.9%). But among men, signs of cerebral atrophy were determined in 14 (77.8%) cases, among women – in 5 (27.8%); OR=2.8 (95% CI 1.3–6.0), p=0.004. Leukoareos was also significantly more common in men (n=12; 66.7%) than in women (n=2; 11.1%); OR=3.0 (95% CI 1.0–9.1), p=0.046. Thus, the presence of cerebral atrophic changes in men that did not matter for their sexual activity in the pre-stroke period (Figure 2), to some extent could contribute to the formation of sexual disorders after a stroke. The relatively low prevalence of atrophy of brain structures among women with post-stroke disorders of sexual functions does not allow drawing certain conclusions about possible connections of these two phenomena cerebral atrophy and post-stroke sexual activity.

**Conclusion**

The decrease in sexual activity along with the increase in age can be considered as risk factors for both the background for stroke of cardiovascular pathology, and the unfavorable functional outcome of the acute stroke period.

The presence and severity of atrophic changes in the brain adversely affects the sexual activity of women in the period preceding the stroke, and the dynamics of sexual activity of men in the recovery period of stroke, and the severity of post-stroke neurological deficit is directly correlated with violations in the intimate sphere, especially in women.

Post-stroke sexual disorders have qualitative gender differences: in men they are more often associated with ED, in women with a decrease in libido and the brightness of orgasm.

The presence of post-stroke sexual problems increases the
likelihood of the formation of emotional, cognitive and attention disorders in the recovery period of stroke.

Professional advice on intimate relationships after a stroke should be an integral part of rehabilitation activities.

References


