ANALYSIS OF QUALITY OF LIFE IN PATIENTS WITH LYME DISEASE

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Introduction. The study of the quality of life (QOL) of the population is carried out in different areas: economic, social, philosophical, medical, etc. The variety of approaches to its assessment has led to the number and ambiguity of interpretations of the category "quality of life", focusing on certain aspects. Lyme disease (LD) is a multisystem infectious disease with a polymorphic clinical picture and the possibility of developing latent forms with a high risk of chronization which leads to disability and reduced QOL of patients [1, 2, 3].

QOL is based on the subjective satisfaction of the individual with himself and his life, as well as in the general characteristics that dominate in human life as a biological, psychological (spiritual) and social phenomenon. For assessing QOL was used general and specific questionnaires developed by experts from the world's leading clinical centers in accordance with the principles of evidence-based medicine and the requirements of Good Clinical Practice, created an opportunity to quantify this subjective feeling. General questionnaires measure a wide range of health perception functions and can be used to assess the QOL of any patients suffering from various diseases, as well as to assess the QOL of population [4, 5]. One of the most common general questionnaires is Medical Outcomes Study Questionnaire Short Form 36 Health Survey (SF-36) [2]. It is currently used in 95% of scientific studies to study QOL in various human conditions [6, 7].

QOL is a comprehensive description of the physical, psychological, emotional and social functioning person, based on its subjective perception in the medical sense it is always connected with health. The study of QOL is a relatively new area of clinical research. However, it is attracting more and more attention and in some cases may be the main criterion for the clinical effectiveness of therapy [6, 8, 9].

According to the classical definition, QOL is a generalized socio-economic category that includes not only the level of consumption of material goods and services (standard of living), but also the satisfaction of spiritual needs, health, life expectancy, environmental conditions, moral psychological climate, emotional comfort [3, 10]. Despite the significant amount of work and the variety of approaches to the interpretation of QOL, in general, the scientific community agrees that this category is a capacious, multidimensional and complex concept [11, 12].

The lack of research in patients with LD quality of life, its dependence on gender encourages such a study.

Material and methods. The main group included 45 patients with LD of moderate severity in the stage of local infection, erythema migrans, who were hospitalized at Sumy Regional Infectious Diseases Clinical Hospital named after Z.Y. Krasovitsky. The mean age of patients was (45.89 ± 2.06) years, of whom 22 (48.88%) were men and 23 (51.12%) were women. Patients were hospitalized for an average of (25 ± 3.96) days from the onset of the disease. The diagnosis was verified on the basis of an epidemiological anamnesis (tick bite), clinic (erythema migrans), serological tests (detection of antibodies to *B. burgdorferi*). Clinically and anamnestically all patients didn't have somatic, other infectious diseases and diseases of other etiology, exacerbation of chronic inflammatory processes, hereditary diseases, etc. Patients were divided by gender into 2 subgroups. The mean age was the same and was in men (42.06 ± 2.78) years, in women – (49.53 ± 3.01) years. All medical and diagnostic procedures were performed with the informed consent of patients.

The comparison group included 41 medical workers of Sumy Regional Infectious Diseases Clinical Hospital named after Z.Y. Krasovitsky. The comparison group was also divided by gender into two subgroups - 20 (48.78%) men and 21 (51.22%) women. The mean age was in men (35.10 ± 2.41) years, in women - (40.58 ± 3.42) years. There was no significant statistical difference in the distribution of patients and the comparison group by age and gender.

The physical and psychological components of health were assessed using the SF-36. To interpret the obtained results was used from the data processing instructions of the questionnaire SF-36.

Assessment of QOL of patients and comparison groups was performed on eight scales: 1 - physical functioning (PF), low values on this scale indicate that the patient's physical activity is significantly limited by his health; 2 - role functioning due to physical condition (RP), low values indicate that daily activities are significantly limited by the patient's physical condition; 3 - pain intensity (BP), low indicators indicate that pain significantly limits the patient's activity; 4 - general health (GH), than the lower the score, the lower the assessment of health; 5 - vital activity (VT) means feeling full of strength and energy or, conversely, exhausted; 6 - social functioning (SF), low scores indicate a significant limitation of social contacts, decreased level of communication due to deterioration of physical and emotional state; 7 - role functioning due to emotional state (RE), low rates are interpreted as limitations in the performance of daily work, due to deteriorating emotional state; 8 - mental health (MH), low levels indicate the presence of depressive, anxious experiences, mental distress. Scales 1-4 show the physical component of health, and 5-8 - the psychological. Each scale has a value from 0 to 100, where 100 corresponds to complete health. Thus, the higher the values mean the higher level of QOL.

Used clinical methods, questionnaires, mathematical processing. All data were entered into the "Electronic Study Card". The results of clinical examinations and studies were processed by the method of variation statistics (Student's t-test) using computer programs Microsoft Office Excel 2010, Statistica 10 and online calculator (https://medstatistic.ru/calculators.html).

Results and discussion. Before conducting QOL questionnaire, all patients with LD underwent a clinical and instrumental examination. It was found that the leading complaint was general weakness, which was in 1.2 times more common in women than in men. In women, abdominal pain was 1.5 times more common, splenomegaly 2.8 times more common, local

manifestations - pain and itching in the area of erythema migrans - 4.8 and 1.8 times more often. Complaints of fever (1.5 times), dizziness (5.2 times) and cyanotic of erythema migrans (3.1 times) were more common in men (Table 1).

Table 1. Patients' symptoms, abs. (%).

Syndrome	Complaints	Gender	
		Men (n=22)	Women (n=23)
Generally infectious	General weakness	16 (72,73)	19 (82,60)
	Decreased efficiency	4 (18,18)	0
	Rising temperature	7 (31,82)	5 (21,74)
	Sweating, chills	1 (4,55)	3 (13,04)
Dyspeptic	Bitterness in the mouth, pain in the right upper quadrant	1 (4,54)	3 (13,04)
	Abdominal pain	5 (22,73)	8 (34,78)
Neurological	Dizziness	5 (22,73)	1 (4,35)
	Insomnia	0	2 (8,70)
	Numbness of the limbs	1 (4,55)	2 (8,70)
	Decreased memory	4 (18,18)	5 (21,74)
	Tinnitus	0	4 (17,39)
	Feeling of heartburn on the body	0	2 (8,70)
Local	Pain at the site of the bite	1 (4,54)	5 (21,74)
	Itch	8 (36,36)	15 (65,22)
	Cyanoticity	3 (13,64)	1 (4,35)
Hepatomegaly (ultrasound signs)		14 (63,64)	16 (69,57)
Splenomegaly (ultrasound signs)		1 (4,55)	4 (17,39)

In the study of QOL it was found that the on PF scale (which reflects the degree to which physical condition limits the performance of physical activity (self-care, walking, climbing stairs, weight transfer, etc.)) the highest rates were recorded in men from the comparison group, the lowest - in women with LD. This indicator was also significantly higher in men from the comparison group than in women from this group (p≤0.05) and women with LD (p≤0.001). In men with LD this indicator was higher than in women from the comparison group (p≤0.05) and women with LD (p≤0.01).

The RE indicator of the influence of physical condition on daily role activity (work, performance of daily duties) was also the highest in men with LD, the lowest in women from the comparison group. This indicator was the lowest in women from both groups (LD and healthy) compared to men from the comparison group (p≤0.05). Compared to men with LD the indicator on this scale was also lower than in women from the comparison group (p≤0.01) and women with LD (p≤0.05).

BP (the effect of physical pain on the ability to engage in daily activities, including housework and work outside the home) most affects women with LD, the least - men from the comparison group, but in the comparison group it is significantly lower in women than men (p≤0.01). The same trend is observed in patients with LD: women experience the impact of physical pain more than men (p≤0.05).

GH rate of the patient's assessment of their health status now and in the future treatment is lower in women with LD than in men from the comparison group (p≤0.01) and men with LD (p≤0.05). On this scale the highest rate in men from the comparison group, the lowest - in women with LD.

The indicator of VT was the highest in women from the comparison group. The same level of this indicator was in men from the comparison group, in men with LD and in women with LD.

SF rate was lower in men from the comparison group than in men with LD (p≤0.05) and in women from the comparison group (p≤0.01) and women with LD (p≤0.05). The highest level of SF was in men from the comparison group, the lowest - in women with LD.

When assessing the RE (degree of emotional state that interferes with the performance of work or other daily activities (including high time, reduced workload, reduced quality, etc.) found that the highest rates were in men with LD, the lowest in women from the comparison group. This indicator was significantly higher in men with LD compared to men from the comparison group (p≤0.05), women from the comparison group and women with LD (p≤0.01).

According to the MH scale (mood, the presence of depression, anxiety, the overall rate of positive emotions") indicator was significantly lower in women from the comparison group compared to men from the

comparison group (p≤0.01). No statistically significant difference was found between the other groups (Table 2)..

Table 2. QOL in patients with LD and comparison groups

Indicator	Comparison group (n=41)	Comparison group (men) (n=20)	Comparison group (women) (n=21)	Patients with LD (n=35)	Men with LD (n=17)	Women with LD (n=18)
PF	86,46±3,44	94,50±1,20	78,81±6,24*	82,83±3,57	93,76±2,95**	72,50±5,38*,***
RP	62,20±5,99	76,25±6,66	48,81±9,04*	67,23±6,94	83,82±8,82**	51,56±9,39*,***
BP	74,17±3,58	85,93±3,75	63,14±5,44*	73,43±4,35	84,41±4,70**	63,06±6,40*,***
GH	60,27±2,27	66,53±4,34	55,76±3,42*	58,29±3,26	65,00±2,64	50,50±4,16*,***
VT	54,76±2,82	58,00±3,11	53,33±4,71	60,10±3,88	68,82±4,17*,**	51,94±5,92***
SF	71,98±2,75	73,75±4,34	70,29±3,50	76,70±3,43	86,03±2,81*,**	67,92±5,42***
RE	53,66±6,36	61,67±8,47	46,03±9,34	65,71±6,76	84,31±7,07*,**	48,15±9,80***
MH	59,85±2,49	66,40±2,88	53,62±3,56*	59,60±4,09	65,29±5,43	54,22±5,94
PH general	70,77±6,07	82,13±5,68	61,63±6,43*	70,44±5,17	80,38±6,34**	59,40±5,21*,***
MH general	60,06±4,19	64,95±3,40	55,82±5.13	65,54±3,97	76,11±5,29**	55,55±4,31***

*Note: * - significant difference in relation to men from the comparison group; ** - in relation to women from the comparison group; *** - in relation to men with LD; Student's t-test was used for mean values (p <0.01- 0.001).*

The general physical state of health is significantly higher in men from both groups than in women, but the general mental state is higher only in men with LD compared to women in both groups (Fig. 1).
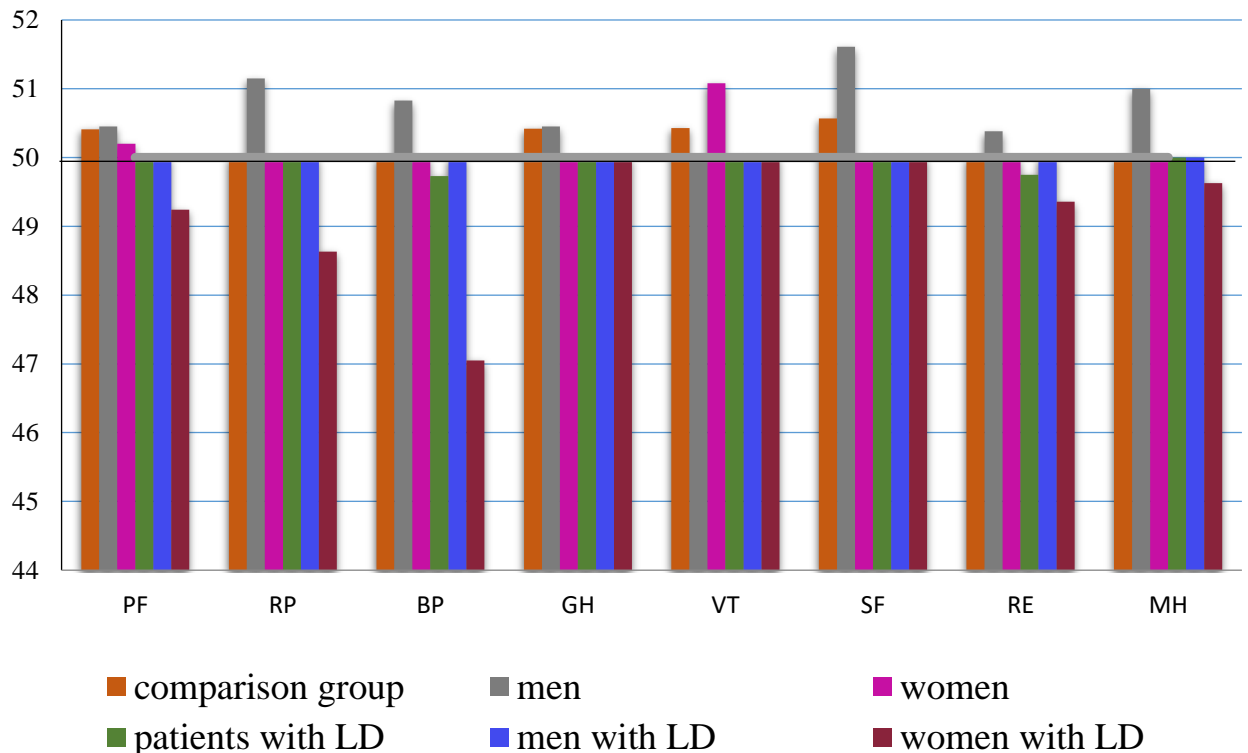
Fig. 1. The level of QOL in people from the comparison group and patients with LD depending on gender.

For bringing the distribution closer to normal and to allow direct interpretation of QOL parameters, the values of all SF-36 scales were standardized. For each respondent on all scales, the z-score was calculated in relation to the difference of the transformed value of each scale with the average value in the group to the standard deviations. A 50% level of "ideal" health and the same standard deviation of 10 were chosen to standardize the values. Due to the fact that the standard deviations were the same for all and for all scales were equal to 10, each point of difference or change in the account had a direct interpretation: one point of change was equal to 0.10.

Table 3 - Standardized QOL indicators (50% level of "ideal" health, with a standard deviation of 10)

Indicator	Comparison group (n = 41)	Comparison group men (n = 20)	Comparison group women (n = 21)	Patients with LD (n = 45)	Men with LD (n = 17)	Women with LD (n = 18)
on PF scale						
Average value	50,41	50,45	50,20	49,98	50,00	49,24
P 25 %	49,74	50,20	50,41	43,93	41,60	42,88
P 50 % (Me)	54,26	55,12	53,91	53,39	54,17	52,19
P 75 %	56,52	55,12	55,66	58,12	60,26	57,67
Min-Max	60-100	85-100	60-100	0-100	50-100	0-100
on RP scale						
Average value	50,00	51,15	49,99	49,99	50,00	48,63
P 25 %	41,40	49,58	39,85	42,76	54,44	38,62
P 50 % (Me)	54,29	49,58	48,91	52,98	54,44	49,60
P 75%	56,52	57,98	54,94	57,98	54,44	60,77
Min-Max	25-100	75-100	25-100	0-100	25-100	0-100
on BP scale						
Average value	50,00	50,83	49,99	49,73	50,00	47,05
P 25 %	45,41	46,77	39,38	43,93	44,63	12,00
P 50 % (Me)	54,89	48,67	49,60	53,39	58,04	45,23
P 75%	60,74	60,80	56,24	57,98	58,04	80,05
Min-Max	51-100	72-100	51-100	21-90	42-90	21-90
on GH scale						
Average value	50,42	50,45	50,00	49,99	50,00	49,99
P 25 %	44,47	41,52	43,55	42,33	41,87	41,22
P 50 % (Me)	51,26	49,57	51,20	51,92	53,06	50,85
P 75%	56,69	60,18	59,50	57,88	58,66	57,79
Min-Max	40-82	47-77	40-82	25-92	30-92	25-80
on VT scale						
Average value	50,43	50,00	51,08	50,00	50,01	50,00
P 25 %	42,04	44,24	42,62	23,80	44,89	43,74
P 50 % (Me)	47,50	46,06	49,54	43,40	50,67	47,23
P 75%	58,41	56,83	58,76	54,04	62,05	54,70
Min-Max	25-100	35-80	25-100	20-100	40-100	20-100
on SF scale						
Average value	50,57	51,61	50,00	50,00	49,99	49,99
P 25 %	44,61	42,59	46,76	42,99	40,48	47,64
P 50 % (Me)	51,77	50,64	54,54	49,16	51,27	50,36
P 75%	58,94	58,69	54,54	55,32	62,05	58,52
Min-Max	37,5-100	50-100	37,5-100	25-100	62,5-100	25-100
on RE scale						
Average value	49,99	50,38	49,99	49,75	50,00	49,36
P 25 %	36,98	42,52	38,59	41,66	43,94	38,42
P 50 % (Me)	53,14	51,32	46,39	49,99	55,38	50,45
P 75%	61,23	60,12	61,97	58,32	55,38	57,06
Min-Max	20-100	40-100	20-100	0-100	0-100	0-100
on MH scale						
Average value	50,00	51,00	50,00	50,00	50,00	49,63
P 25 %	43,40	45,07	44,98	42,72	45,88	43,16
P 50 % (Me)	50,73	48,13	48,65	50,16	51,21	49,12
P 75%	58,06	58,24	55,96	57,61	56,57	57,06
Min-Max	16-100	44-100	16-100	6-100	6-100	6-92

Thus, when analyzing the results of the study, it was found that the level of physical and mental health there is no statistically significant difference between the comparison group and patients with LD. QOL indicators are located in the range of 40 - 60%, which indicates the average rate of QOL in both patients with LD and individuals from the comparison group. By all indicators,

the best level of QOL in almost healthy men, the worst in the group of women with LD.

In women with LD, there is a decrease in PF by 0.76, RE by 1.37 and BP by 2.95 from the average, which indicates that the disease and pain negatively affect the physical condition and limit daily activities. The scales responsible for mental health show a decrease from the average - RE by 0.64 and MH by 0.37, which indicates a tendency of women to develop depression and anxiety and limit daily work due to emotional state. On the VT and SF scales, the indicators are at the level of the average, which indicates that the disease does not affect the social life of patients (Table 3).

The results suggest that in the treatment of women with LD special attention should be paid to the emotional state and mental health of patients and take into account the presence of pain, which can affect the recovery time.

Conclusions. QOL indicators in almost healthy individuals are at the level of averages and do not differ by gender. The most satisfactory in the field of physical and mental functioning are almost healthy men. By gender, higher QOL is higher in men with LD than in women with LD. Mental health indicators on the scale of VT and SF in patients at the average level indicate that the disease does not affect the social life of patients. The lowest indicators on the scales of RE due to emotional state and mental state and the lower indicators on the scales of physical health in women with LD indicate the negative impact of the disease on mental and physical health in women. Therefore, the analysis of not only clinical manifestations, but also taking into account the subjective condition of the patient and changes in mental and physical health will allow to take a comprehensive approach to the treatment of patients with LD and accelerate recovery (especially in women with LD).

Analysis of quality of life in patients with Lyme disease
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Introduction. Lyme disease is a multisystem infectious disease with a high risk of chronization which leads to disability and reduced QOL of patients. The study of QOL is a relatively new area of clinical research. One of the most common general questionnaires is the Short Form Medical Outcomes Study (SF-36). The aim of the study was to investigate the level of QOL in patients with LD in comparison with almost healthy individuals and to establish the gender characteristics of different components of health. **Material & methods**. The main group included 45 patients with LD of moderate severity in the stage of local infection, erythema migrans. The mean age of patients was (45.89 ± 2.06) years, of whom 22 (48.88%) were men and 23 (51.12%) were women. Patients were hospitalized for an average of (25 ± 3.96) days from the onset of the disease. The diagnosis was verified on the basis of an epidemiological anamnesis (tick bite), clinic (erythema migrans), serological tests (detection of antibodies to *B. burgdorferi*). Patients were divided by gender into 2 subgroups. The mean age was the same and was in men (42.06 ± 2.78) years, in women – (49.53 ± 3.01) years. Assessment of QOL of patients

and comparison groups was performed on eight scales: 1 - physical functioning, 2 - role functioning due to physical condition, 3 - pain intensity s activity, 4 - general health, 5 - vital activity, 6 - social functioning, 7 - role functioning due to emotional state, 8 - mental health. Used clinical methods, questionnaires, mathematical processing. All data were entered into the "Electronic Study Card". The results of clinical examinations and studies were processed by the method of variation statistics (Student's t-test) using computer programs Microsoft Office Excel 2010, Statistica 10 and online calculator. **Results & discussion.** Surveys of practically healthy people and patients with Lyme disease were conducted, the features of physical and mental components of health depending on gender were studied. In terms of gender, physical and emotional health are better in men than in women. Practically healthy men are the most satisfactory in the field of physical and mental functioning, and women with Lyme disease are the least satisfied. Mental health indicators on the scale of vital activity and social functioning in patients at the average level indicate that the disease does not affect the social life of patients. The lowest indicators on the scales of role functioning, mental state, physical health in women with LD indicate the negative impact of the disease on their mental and physical health, which requires additional attention. **Conclusion.** The most satisfactory in the field of physical and mental functioning are men in comparison group. By gender, higher QOL is higher in men with LD than in women with LD. Mental health indicators on the scale of VT and SF in patients at the average level indicate that the disease does not affect the social life of patients. The lowest indicators on the scales of RE due to emotional state and mental state and the lower indicators on the scales of physical health in women with LD indicate the negative impact of the disease on mental and physical health in women. Therefore, the analysis of not only clinical manifestations, but also taking into account the subjective condition of the patient and changes in mental and physical health will allow to take a comprehensive approach to the treatment of patients with LD and accelerate recovery (especially in women with LD).
Keywords: Lyme disease, quality of life in patients

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