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QUALITY OF LIFE EVALUATION IN PATIENTS WITH PAROXYSMAL ATRIAL FIBRILLATION

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SUMMARY

Background: *To estimate quality of life (QoL) in patients with paroxysmal atrial fibrillation (AF) using the SF-36 Health Status Survey.*

Materials and methods: *In a single-center study involving 6,630 patients, we defined a group of 97 patients having an incidental finding of atrial fibrillation (AF). The control group included 99 patients from the same primary cohort, but without paroxysmal AF. The two study groups matched closely in anthropometric parameters and comorbidity. All patients underwent standard laboratory and instrumental research methods. In the primary visit, at the time of AF detection, we evaluated the patients QoL using the classical SF-36 Health Status Survey. At the second visit (6±0.5 months follow-up) and third visit (12±0.5 months follow-up), we re-evaluated the QoL using the SF-36 Health Status Survey.*

Results: *The absolute majority (95/97; 98%) of patients of the main group had a special variant of extrasystoles, namely the early atrial "P on T" type (versus 4.0% incidence in the control group) [OR 846 (382;187,000)]. The main group showed a significantly greater frequency of supraventricular extrasystoles. At the 1st visit, there was no group differences in QoL scores between the main and control groups ($p>0.05$). However, at 6 and 12 months follow-up, metrics of physical and mental health differed significantly between groups stratified by low and high QoL ($p<0.05$). The asymptomatic patients with paroxysmal AF and high compliance in oral anticoagulant therapy showed higher physical activity and social functioning.*

Conclusions: *Paroxysmal AF in asymptomatic patients is a predictor for declining QoL during 12 months follow-up in patients with cardiovascular pathology. The paroxysmal AF patients who had high compliance of oral anticoagulant therapy proved to have improved physical activity and social functioning.*

Key words: *atrial fibrillation – paroxysmal atrial fibrillation - quality of life*

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INRODUCTION

Quality of life (QoL) is a key issue in cardiology patients. In our previous research, we demonstrated a global decline in QoL parameters among patients with arterial hypertension and hemodynamically insignificant carotid bifurcation. QoL is an important health outcome and target of medical treatment in patients with atrial fibrillation (AF); preparing clinical recommendations and treatment guidelines calls for an early evaluation of QoL (Aliot et al. 2014). A diagnosis of paroxysmal AF calls for application of anti-arrhythmic drugs and oral anticoagulants, which generally marks a decrease QoL in these patients. In the literature, there are several studies of QoL in AF, mostly in the context of treatment effects. Patients with symptomatic AF associated with palpitations, irregular heartbeat, dyspnea, and fatigue generally demonstrated lower QoL (Abu et al. 2022). Thus, there is an improvement in QoL after AF ablation (Sridhar et al. 2020, Essebag et al. 2020, Andrade et al. 2022). An integrative literature review of 23 publications dated 2000-2018 revealed that the most common factor associated with health-related QoL in patients with AF was anxiety-specific to AF in the symptoms domain, followed by frequency and severity of symptoms, and the New York Heart Association functional class (Son et al. 2019). In a prospective study with 3836 patients observed for almost 4 years, lower QoL scores in patients with AF was strongly associated with chronic heart failure, cardiovascular death, and all-cause mortality (Krisai et al. 2020). In another study of QoL contrasting permanent and paroxysmal AF, the type of AF had no significant effect on the overall QoL score (Peinado et al. 2010). However, patients with permanent AF had higher scores in the psychological dimension, i.e., better health-related QoL.

The Aim of this investigation was to assess QoL in patients with paroxysmal AF using the SF-36 Health Status Survey.

MATERIALS AND METHODS

We performed a single-center study involving 6,630 patients, all of whom underwent 24 hours Holter ECG monitoring. All patients were admitted to the Cardiology Department with suspicious diagnosis of ischemic heart disease. To reveal the heart arrhythmias they were performed ECG monitoring duration 24 hours. None of

Table 1. Clinical characteristics of the groups

Parameters		Main group (n=97)	Control group (n=99)	Statistics
Gender, n (%)	F	53 (54.6)	53 (53.5)	χ^2=0.000, p=0.991
	M	44 (45.4)	46 (46.5)	
Age, years, Median (Q1, Q3)		72 (65, 78)	71 (64, 79)	H=0.007, p=0.933
Observation time, h, Median (Q1, Q3)		22.7 (21.9, 23.2)	22.3 (21.4, 23.1)	H=1.376, p=0.120
AF time, sec, Median (Q1, Q3)		81 (14, 8925)	0 (0, 0)	H=167.876, p<0.001
HR (in AF), Median (Q1, Q3)		107 (94, 117)	0.0 (0, 0)	H=167.142, p<0.001
Supraventricular PT, sec, Median (Q1, Q3)		5 (0, 34)	0.0 (0, 9)	H=9.840, p=0.002
Ventricular PT, sec, Median (Q1, Q3)		0 (0, 0)	0 (0, 0)	H=0.099, p=0.753
Number of SVE, Median (Q1, Q3)		633 (284, 2098)	79 (28, 350)	H=40.635, p<0.001
Single SVE, Median (Q1, Q3)		461 (238, 1767)	69 (22.5, 315)	H=37.952, p<0.001
Paired and group SVE, Median (Q1, Q3)		26 (6, 93)	4 (1, 12)	H=38.272, p<0.001
Allorhythmias with SVE, Median (Q1, Q3)		24 (1, 401)	0 (0, 9.5)	H=31.647, p<0.001
Atrial ES, Median (Q1, Q3)		602 (262, 2028)	74 (27.5, 314)	H=36.843, p<0.001
Number of PVS, Median (Q1, Q3)		24 (3, 149)	16 (3, 488.5)	H=0.176, p=0.675
Single PVS, Median (Q1, Q3)		20 (2, 143)	14 (2, 328.5)	H=0.121, p=0.727
Paired PVS, Median (Q1, Q3)		0 (0, 6)	0 (0, 2)	H=2.100, p=0.147
Allorhythmias with PVS, Median (Q1, Q3)		0 (0, 0)	0 (0, 3)	H=0.193, p=0.661
R on T, Median (Q1, Q3)		2 (1, 5)	0 (0, 0)	H=74.763, p<0.001
P on T, n (%)	Yes	95 (97.9%)	4 (4.0%)	χ^2=172.81, p<0.001
	No	2 (2.1%)	95 (96%)	
QT interval max, sec, Median (Q1, Q3)		0.5 (0.5, 0.6)	0.5 (0.5, 0.6)	H=2.495, p=0.114
RR max, sec, Median (Q1, Q3)		1.7 (1.6, 1.9)	1.5 (1.4, 1.8)	H=14.172, p<0.001
Prolapse of the QRS complex, Median (Q1, Q3)		0 (0, 2)	0 (0, 0)	H=11.732, p=0.001
ST segment depression, n (%)	No	84 (42.86%)	91 (46.43%)	χ^2=2.377, p=0.305
	Yes	13 (6.63%)	8 (4.08%)	
ECS, n (%)	No	95 (48.47%)	99 (50.51%)	χ^2=0.526, p=0.468
	Yes	2 (1.02%)	-	

Notes: Normal distribution of characteristics was not observed. Abbreviations. HR – heart rate; ES – extrasystole; SVE – supraventricular extrasystole; PVC – ventricular extrasystole; ECS – pacemaker; R on T – early extrasystole of the R on T type; P on T – early extrasystole of the P on T type; PT – paroxysmal tachycardia

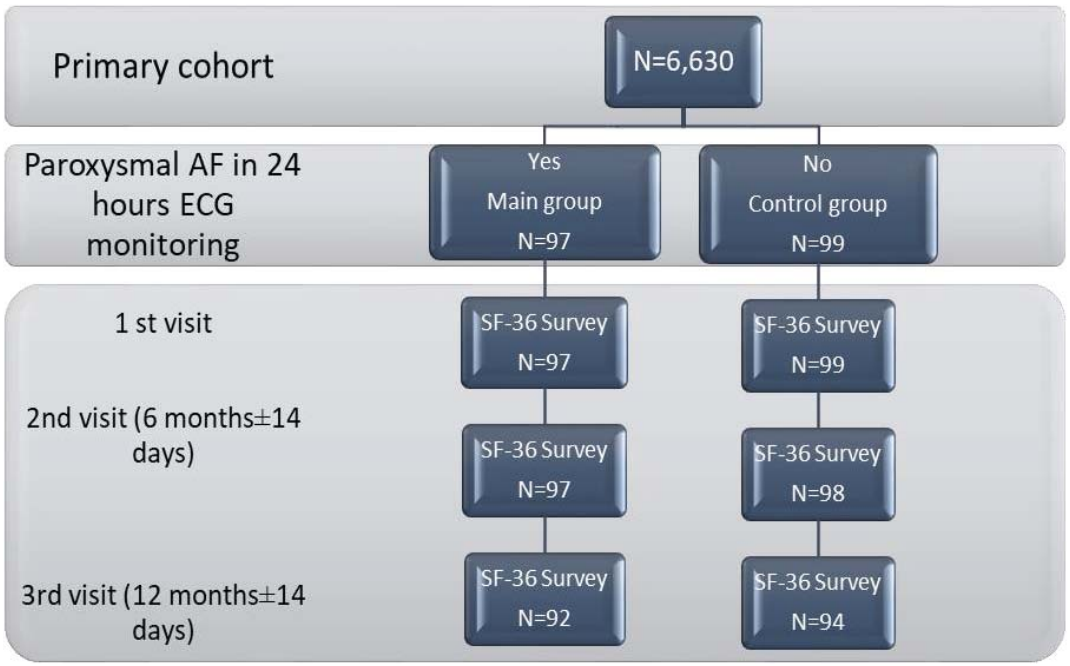

Figure 1. Design of investigation

the patients had AF in anamnesis, nor did they have history of typical complaints associated with heart arrhythmia, such as palpitations in the chest area or irregular heartbeat. Moreover, previously performed 24-hours ECG monitoring of the patients had not revealed any AF paroxysms. From the entire cohort, the 97 having an incidental finding of paroxysmal AF we assigned to the main study group. We composed a control group consisting of 99 patients of the same primary cohort, but without paroxysmal AF. We endeavored to obtain good matching the study groups with respect to anthropometric parameters and comorbidity. All patients underwent standard laboratory and the following instrumental research tests: 24-hour Holter ECG monitoring, transthoracic echocardiography, Doppler ultrasound of the brachiocephalic arteries, and (when indicated) stress echocardiography with exercise, and coronary angiography. Concerning the 24-hour Holter ECG monitoring, we considered the following main parameters as factors: gender, age, pacemaker, heart rate analysis, supraventricular and ventricular ectopic activity, pauses and blockades dynamics of the ST segment PQ and QT intervals, heart rate variability, and the presence of early extrasystoles of the "P to T" and "R to T" types.

In the primary visit, upon first detection of paroxysmal AF, we evaluated the patients' QoL score using the classical SF-36 Health Status Survey. At the second (6±0.5 months) and third (12±0.5 months) visits in follow-up, we re-evaluated the QoL, and then proceeded to analyze the compiled results. The flow-chart for the experimental design is depicted in Figure 1.

We followed the principles of evidence-based medicine, in a study performed in accordance with the principles of the Declaration of Helsinki. The study protocol was approved by the Ethics Committee of Samara State Medical University (Protocol №239 dated 10.11.2021). First, we tested the normality of distributions of the analyzed parameters. In cases of normal distribution, we used the parametric criteria (mean and standard deviation), and undertook between group comparisons using one-way analysis of variance (ANOVA). In cases of non-normal distributions, we determined the medians and quartiles 1 and 3 (Q1 and Q3) and undertook group comparisons by the Kruskal-Wallis method. We considered differences between groups to be statistically significant at the threshold of $p \leq 0.05$. Statistical analysis was performed using MedCalc® Statistical Software version 20.118 (MedCalc Software Ltd, Ostend, Belgium; https://www.medcalc.org; 2022), GraphPad Prism for Windows, version 10.1.0 (GraphPad Software, San Diego, California USA, www.graphpad.com) and the free software environment R (https://cran.rstudio.com/).

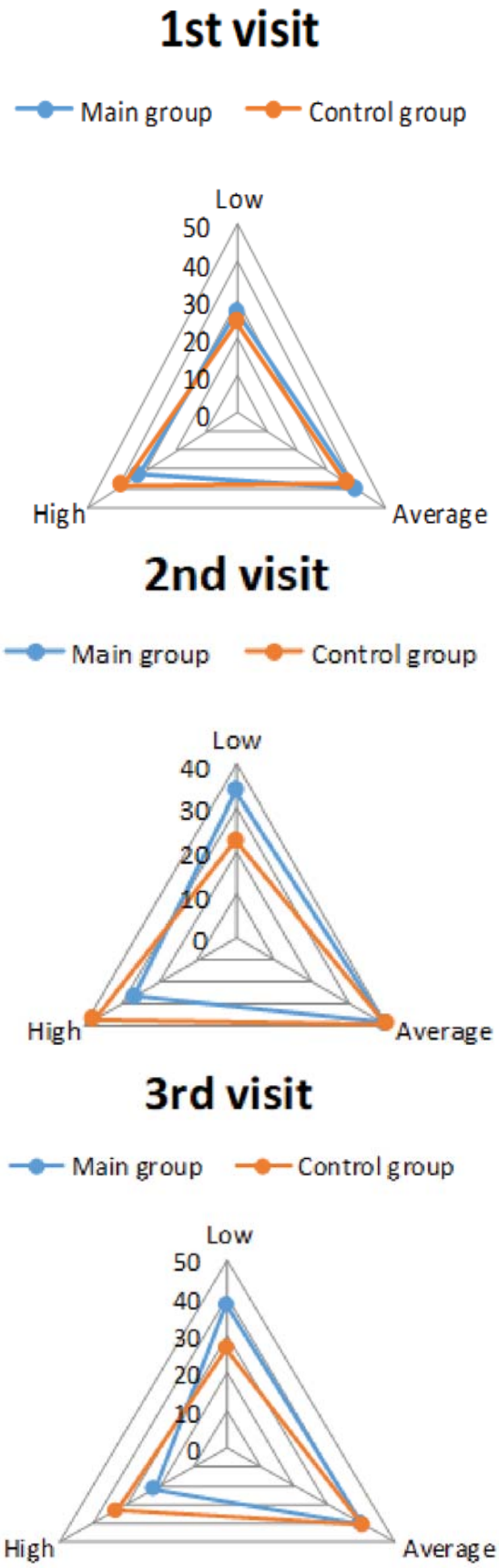

Figure 2. Distribution of results of QoL evaluation within the groups in the 1st, 2nd, 3rd visits in accordance to the SF-36 Survey

RESULTS

We present the main ECG characteristics of the groups in Table 1.

In the 24-hour Holter ECG monitoring the absolute majority (97/99; 98%) of patients of the main group with paroxysmal AF had a special variant of extrasystoles, namely the early atrial "P on T" type (versus 4.0% in the control group) [OR 8461 (382;187,000)]. In addition, the number of supraventricular extrasystoles was significantly higher in the main group, both single and paired and group, but the number of ventricular extrasystoles did not differ significantly by group.

In SF-36 Survey, we analyzed the main parameters of physical (PH) and mental health (MH), where a net score ≥ 60 is high, 30-59 is average, and 0-29 points is low PH and MH (Figure 2).

In primary interview at the first visit, patients of both groups were asymptomatic, and there were no statistically significant differences in QoL results ($p>0.05$). However, at the 6 and 12 months follow-up examinations, there were significant differences in PH and MH between the groups of the patients – lower levels of QoL were observed in the main group ($p<0.05$). QoL scores indicated that the symptomatic patients with paroxysmal AF who had high compliance in oral anticoagulant therapy showed higher physical activity and social functioning.

DISCUSSION

AF is the most common form arrhythmia worldwide, despite the availability of various preventive and treatment measures. Asymptomatic patients with AF are at risk for underdiagnosis of heart arrhythmias, and consequently are at higher risk for stroke and other serious thromboembolic complications. This is precisely why timely diagnosis and treatment of AF is critically important for this category of patients. Results of our previous research on this topic highlighted the importance of the duration of maximum RR ECG intervals in AF (Germanova et al. 2023).

In the present study, we assembled a cohort of asymptomatic patients, with incidental diagnosis of paroxysmal AF. All patients were asymptomatic in heart arrhythmias, with admission to the cardiology department to identify signs of coronary blood flow insufficiency. We evaluated prospectively their QoL scores in a series of three visits extending over one year following the first determination of AF. The longitudinal QoL results indicated that the diagnosis of AF and resultant need for pharmacotherapy with antiarrythmics and anticoagulants was a key juncture in their psychological state and self-reported QoL. The follow-up survey showed the largest decline in QoL for both patient groups at the third visit, i.e., one year after the initial AF diagnosis. The prevalence of low QoL scores was significantly higher in the main group (38.0%), versus 26.6% in control group after one year ($p<0.05$). Moreover, there were significantly more patients reporting high QoL in the control group (33.0%), versus 21.8% in the main group ($p<0.05$). Correction of arrhythmia, as well as treatment of the other cardiovascular pathology, including timely performance of coronary angiography and angioplasty, if indicated, likely contributed to maintaining a higher social functioning of this category of patients. Most of the patients explained that their declining QoL reflected their distress about the need to follow life-long therapy and make appropriate changes in their diet and lifestyle, and the resultant limitations arising in their everyday routine life. However, we suppose that the patients who followed their medication are those who are more motivated to improve their lifestyle, aiming to avoid complications that are often associated with AF (mostly stroke).

CONCLUSIONS

- Paroxysmal AF in asymptomatic patients is a strong predictor for worsening QoL worsening in patients with cardiovascular pathology, conspicuously in patients with de novo diagnosis of paroxysmal AF time.
- QoL scores showed that patients with paroxysmal AF having high compliance to oral anticoagulant therapy showed higher physical activity and social functioning to follow-up.

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Conflict of interest:

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Contribution of individual authors:

Olga Germanova & Louisa Koonts: search and analysis of literature, collection of clinical data, data interpretation, writing the first draft.

Yulia Reshetnikova, Michail Sheifer, Kseniya Bikbaeva, Natalia Kuvshinova, Domenico De Berardis & Giuseppe Galati: search and analysis of literature, data interpretation, and editing.

All authors approved the final version of the article before its submission.

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