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Prognostic Power of Clinical Predictors of Syntropical Cardiac Lesions in Patients with Systemic Lupus Erythematosus

Introduction. Systemic lupus erythematosus (SLE) is a multisystem autoimmune disease that is frequently accompanied by cardiovascular lesion, particularly of the heart. The pericardium, myocardium, heart valves, and coronary arteries may be affected, contributing substantially to morbidity and mortality in SLE patients [5, 10]. In clinical practice, it is important to identify factors that may predict such lesion to guide treatment and preventive strategies. It has been shown that disease duration, age, the degree of systemic inflammation, laboratory markers of autoimmune activity, and classical risk factors (hypertension, dyslipidemia) are associated with an increased risk of cardiac complications in patients with SLE [3, 4, 12]. Some researchers [5] have used software to identify key clinical and laboratory factors predicting heart damage in SLE patients, while others [9] have proposed a scale for predicting the occurrence of adverse cardiovascular events calculated based on clinical and laboratory parameters.

As is known clinical symptoms such as dyspnea, palpitations, chest pain, and fatigue, either alone or in combination, may be signs of cardiac lesion in SLE. However, not all clinical manifestations carry the same predictive power, making it necessary to evaluate their relative importance. Systematizing such clinical predictors may allow earlier detection of high-risk patients and initiation of timely treatment or preventive measures.

The aim of the study. To elucidate the prognostic power of clinical predictors associated with systemic lupus erythematosus related cardiac lesion.

Materials and methods. In accordance with the requirements of the Declaration of Helsinki of Human Rights, the Council of Europe Convention on Human Rights and Biomedicine, after signing a voluntary consent to participate in a randomized manner with prior stratification by the presence of SLE (diagnosed according to the American College of Rheumatology (1997) classification criteria and confirmed by the presence of 4 out of the 11 criteria (Order of the Ministry of Health of Ukraine No. 676 dated October 12, 2006 "On approval of medical care protocols in the specialty "Rheumatology", the recommendations of the European League Against Rheumatism (2010) and the American College of Rheumatology (2010, 2012)) as well as syntropic (those that have the same etiological and/or pathogenetic mechanisms as the main disease) cardiac lesions (Order of the Ministry of Health of Ukraine No. 436 dated July 03, 2006 "On the approval of medical care protocols in the specialty "Cardiology" with amendments per Order No. 455 dated July 02, 2014) [1, 2, 11] the study consisted of 118 patients who were treated in the Rheumatology Department of the Municipal Non-profit Enterprise of the Lviv Regional Council "Lviv Regional Clinical Hospital" between 2016 and 2021 (107 women (90.68 %) and 11 men (9.32 %) aged 18 to 74 years (mean age 42.481.12 years)), among which syntropic mitral valve insufficiency (SVI) was detected in 55 patients, mitral leaflet thickening (MLT) in 47 patients, myocarditis in 29 patients, pericardial effusion in 22 patients, and endocarditis in 2 patients.

To determine the prognostic power of clinical predictors of these syntropical cardiac lesions in SLE patients, all available clinical parameters were assessed [6, 7], but only the most diagnostically valuable data from the patient's passport, presenting symptoms, anamnesis of life and disease, and physical examination findings were included in the analysis. The actual material was statistically processed on a personal computer in Excel, 2010 and Statistica 6.0 programs using descriptive statistics and based on conjugation tables. For each clinical predictor, indicators of sensitivity, specificity, p-value for the R. E. Fisher exact test, as well as D. Yule association coefficient (AC) and contingency coefficient (CC), absolute risks (probability) of cardiac manifestations related to SLE, in the presence and absence of clinical predictors, absolute and relative risk reduction indicators, as well as

relative risk and odds ratio and 95.0 % confidence intervals and p-values for the last two indicators were calculated.

For the study, clinical predictors were selected that were statistically significantly different in the number of cases in patients with SLE without the studied syntropical heart lesion ($p < 0,05$), and those that had a positive association with syntropical lesion (AC greater than 0,00) with subsequent selection by p-values for relative risk and odds ratio less than 0,05.

To identify constellations of clinical predictors, Newton's binomial coefficient was applied using the Solver add-in for MS Excel. The optimal constellation was defined as the one with the highest combined sensitivity and specificity among all possible combinations. For the predictor constellations, all the previously mentioned indicators were also calculated and similarly selected.

Among the selected clinical predictors and the optimal constellation, a single statistically optimal predictor set was determined based on the highest absolute risk value for estimating the likelihood of SLE-related syntropical cardiac lesion.

A difference was considered statistically significant at $p < 0.050$. The strength of association between each indicator and cardiac lesion was assessed using Yule's coefficient (AC) and the contingency coefficient (CC). An association was considered confirmed if AC ≥ 0.50 or CC ≥ 0.30.

Results and discussion.

Table 1

Prognostic power of clinical predictors for the development of mitral valve insufficiency in patients with systemic lupus erythematosus (predictive power indicators; *p*; %)

No. i.o.	Clinical predictors / predictor constellation	AR+, %	AR–, %	ARR, pp	RRR, %	RR	CI to RR	*p* (RR)	OR	CI to OR	*p* (OR)
1	Morning stiffness	57.14	38.89	18.25	31.94	1.47	0.99-2.16	0.051	2.09	0.98-4.63	0.067
2	New skin rash	54.55	35.71	18.83	34.52	1.53	1.03-2.27	0.036*	2.16	1.05-4.44	0.036*
3	Dyspnea	60.47	35.37	25.10	41.51	1.71	1.17-2.49	0.006*	2.79	1.31-5.98	0.008*
4	Memory impairment	75.00	39.45	35.55	47.40	1.90	1.32-2.74	0.001*	4.60	1.39-15.21	0.012*
5	Diminished heart sounds	61.29	38.30	22.99	37.51	1.60	1.09-2.34	0.015*	2.55	1.11-5.87	0.027*
6	Systolic murmur at the cardiac apex	48.91	30.30	18.61	38.05	1.61	0.92-2.82	0.092	2.20	0.94-5.14	0.067
7	Accentuated second heart sound over the pulmonary artery	75.01	40.71	34.29	45.72	1.84	1.24-2.74	0.002*	4.37	1.12-17.02	0.034*
8	Constellation: "joint pain + new skin rash + accentuated second heart sound over the aortic area"	93.75	36.70	57.05	60.86	2.55	1.94-3.37	<0.001*	25.88	3.29-203.30	0.002*

Notes: AR+ - absolute risk of the syntropical cardiac lesion in the presence of the clinical predictor (predictor constellation); AR– - absolute risk of the syntropical cardiac lesion in the absence of the clinical predictor (predictor constellation); ARR - absolute risk reduction; pp - percentage points; RRR - relative risk reduction; RR - relative risk; CI - confidence interval; OR - odds ratio; *p* - p-value (Fisher's exact test); * - statistically significant difference between the risk (probability) / odds of the cardiac manifestation in the presence vs. absence of the clinical predictor (or predictor constellation) ($p < 0.050$).

Can be seen in Table 1, in the presence of complaints of morning stiffness AR (probability) of developing MVI in patients with SLE is 57.14 %, while in the absence of this predictor, it is only 38.89 % (ARR 18.25 percentage points, RRR 31.94 %). The RR is 1.47 (95.0% CI 0.99-2.16, $p = 0.051$), the OR index is 2.09 (95.0% CI 0.98-4.63, $p = 0.067$), the reliability of the relationship has not been confirmed.

In the presence of new skin rash AR (probability) of developing MVI in patients with SLE is 54.55 %, while in the absence of this predictor it is 35.71 % (ARR 18.83 percentage points, RRR 34.52 %). The RR is 1.53 (95.0% CI 1.03-2.27, $p = 0.036$), the OR index is 2.16 (95.0% CI 1.05-4.44, $p = 0.036$), where a significant relationship is confirmed.

The AR (probability) of developing MVI in patients with SLE in the case of a complaint of dyspnea is 60.47 %, and in its absence, it is 35.37 % (ARR 25.10 percentage points, RRR 41.51 %). The RR is 1.71 (95.0% CI 1.17-2.49, $p = 0.006$), the OR index is 2.79 (95.0% CI 1.31-5.98, $p = 0.008$), where the relationship is statistically significant.

The presence of a complaint of memory impairment is associated with an increased risk of developing MVI in patients with SLE: AR (probability) is 75.00 %, RR - 1.90 (95.0% CI 1.32-2.74, $p = 0.001$), OR index is 4.60

(95.0% CI 1.39-15.21, $p = 0.012$); in the absence of this complaint it is only 39.45 % (ARR 35.55 percentage points, RRR 47.40%), the reliability of the relationship is confirmed.

In the presence of diminished heart sounds, the AR (probability) of developing MVI in patients with SLE is 61.29 %, in the absence of this prognostic factor it is 38.30 % (ARR 22.99 percentage points, RRR 37.51 %). The RR is equal to 1.60 (95.0% CI 1.09-2.34, $p = 0.015$), the OR index is 2.55 (95.0% CI 1.11-5.87, $p = 0.027$), where a significant relationship is confirmed.

The AR (probability) of having a MVI in patients with SLE in the presence of a systolic murmur at the cardiac apex is 48.91 %, while in the absence of this predictor it is 30.30 % (ARR 18.61 percentage points, OR 38.05 %). The RR is equal to 1.61 (95.0% CI 0.92-2.82, $p = 0.092$), the OR is 2.20 (95.0% CI 0.94-5.14, $p = 0.067$), where the relationship is not statistically significant.

In the presence of the accentuated second heart sound over the pulmonary artery, the AR (probability) of developing MVI in patients with SLE is 75.01 %, while in its absence - 40.31 % (ARR 34.29 percentage points, RRR 45.72 %). The RR is 1.84 (95.0% CI 1.24-2.74, $p = 0.002$), the OR index is 4.37 (95.0% CI 1.12-17.02, $p = 0.034$), the reliability of the relationship has not been confirmed.

Constellation "joint pain + new skin rash + accentuated second heart sound over the aortic area" has the best predictive power for determining the probability of developing MVI in patients with SLE, in which the AR (probability) of developing this syntropical cardiac lesion in patients with SLE is 93.75 %, while in the absence of this predictor it is only 36.70 % (ARR 57.05 percentage points, RRR 60.86 %). The RR of MVI occurrence was 2.55 times higher in the presence of this constellati on of clinical predictors (95.0% CI 1.94-3.37, $p < 0.001$) and it was 25.88 times more often recorded in patients with MVI (95.0% CI 3.29-203.30, $p = 0.002$), a significant difference was found between the risk/possibility of developing MVI in patients with SLE in the presence of a constellation of these clinical predictors and their absence.

Table 2

Prognostic power of clinical predictors for the development of mitral leaflet thickening in patients with systemic lupus erythematosus (predictive power indicators; *p*; %)

No. i.o.	Clinical predictors / predictor constellation	AR+, %	AR–, %	ARR, pp	RRR, %	RR	CI to RR	*p* (RR)	OR	CI to OR	*p* (OR)
1	New skin rash	66.67	34.51	32.15	48.23	1.93	1.20-3.10	0.006*	3.79	1.07-13.39	0.038*
2	Lower-extremity edema	57.14	32.29	24.85	43.49	1.77	1.15-2.73	0.010*	2.79	1.18-6.62	0.019*
3	Dyspnea	54.76	28.92	25.85	47.20	1.89	1.23-2.92	0.004*	2.98	1.38-6.43	0.006*
4	Sensation of irregular heartbeats	52.73	25.71	27.01	51.23	2.05	1.28-3.28	0.003*	3.22	1.52-6.84	0.002*
5	Precordial pain	63.64	35.09	28.55	44.86	1.81	1.09-3.03	0.022*	3.24	0.89-11.73	0.074
6	Diminished heart sounds	54.84	31.91	22.92	41.80	1.72	1.11-2.65	0.015*	2.59	1.13-5.94	0.025*
7	Systolic murmur at the cardiac apex	42.39	24.24	18.15	42.81	1.75	0.91-3.34	0.091	2.29	0.93-5.64	0.069
8	Constellation: "dyspnea + sensation of irregular heartbeats"	69.23	29.29	39.94	57.69	2.36	1.59-3.52	<0.001 *	5.43	2.12-13.88	<0.001 *

The results presented in Table 2 indicate that the AR (probability) of MLT in SLE patients with new skin rash is 66.67 %, whereas in the absence of this predictor it is 34.51 % (ARR 32.15 percentage points, RRR 48.23 %). The RR of developing MLT is 1.93 times higher in the presence of new skin rash (95.0% CI 1.20-3.10, $p = 0.006$), and new skin rash was 3.49 times more frequently identified in patients with MLT (95.0% CI 1.07-13.39, $p = 0.038$), a significant difference was found between the risk / possibility of MLT in the presence of new skin rash and the absence of this predictor.

In case of lower-extremity edema the AR (probability) of developing MLT in SLE patients is 57.14 %, in their absence it is 32.29 % (ARR 24.85 percentage points, RRR 43.49 %). The RR is 1.77 (95.0% CI 1.15-2.73, $p = 0.010$), the OR index is 2.79 (95.0% CI 1.18-6.62, $p = 0.019$), where a significant relationship is confirmed.

The AR (probability) of developing MLT in patients with SLE in case of dyspnea complaints is 57.76 %, while in its absence - 28.92 % (AR 25.85 percentage points, OR 47.20 %). The RR is 1.89 (95.0% CI 1.23-2.92, $p = 0.004$), the OR index is 2.98 (95.0% CI 1.38-6.43, $p = 0.006$), where the relationship is statistically significant.

In the case of complaints of the heart interruptions the AR (probability) of developing MLT in patients with SLE is 52.73 %, if there is no predictor - 25.71 % (ARR 27.01

percentage points, RRR 51.23 %). The RR is equal to 2.05 (95.0% CI 1.28-3.28, $p = 0.003$), the OR index is 3.22 (95.0% CI 1.52-6.84, $p = 0.002$), where a significant relationship is confirmed.

The AR (probability) of MLT in patients with SLE in case of complaint precordial pain is 63.64 %, while in the absence of this predictor it is 35.09 % (ARR 28.55 percentage points, RRR 44.86 %). The RR is 1.81 (95.0% CI 1.09-3.03, $p = 0.022$), the OR indicator is 3.24 (95.0% CI 0.89-11.73, $p = 0.074$), where the relationship is not statistically significant.

The detection of diminished heart sounds in patients with SLE is associated with an increased risk of developing MLT in them: AR (probability) is 54.84 %, RR is 1.72 (95.0% CI 1.11-2.65, $p = 0.015$), OR index is 2.59 (95.0% CI 1.13-5.94, $p = 0.025$), while in the absence of this predictor it is 31.91 % (ARR 22.92 percentage points, RRR 41.80%); a significant relationship has been confirmed.

The AR (probability) of having a MLT in patients with SLE in the case of a systolic murmur at the cardiac apex is 42.39 %, while in the absence of this predictor it is 24.24 % (ARR 18.15 percentage points, RRR 42.81 %). The RR is 1.75 (95.0% CI 0.91-3.34, $p = 0.091$), the OR index is 2.29 (95.0% CI 0.93-5.64, $p = 0.069$), where the relationship is not statistically significant.

In the presence of the constellation of predictors: "dyspnea + sensation of irregular heartbeats", the AR (probability) of the occurrence of MLT in patients with SLE is 69.23 %, in its absence - only 29.29 % (ARR 39.94 percentage points, RRR 57.69 %). The RR is 2.36 (95.0% CI 1.59-3.52, $p < 0.001$), the OR index is 5.43 (95.0% CI 2.12-13.88, $p < 0.001$), the reliability of the relationship is confirmed.

Therefore, the predictor constellation "dyspnea + sensation of irregular heartbeats" has the statistically confirmed optimal predictive power for estimating the likelihood of developing MLT in patients with SLE.

Table 3

Prognostic power of clinical predictors for the development of pericardial effusion in patients with systemic lupus erythematosus (predictive power indicators; *p*; %)

No. i.o.	Clinical predictors / predictor constellation	AR+, %	AR–, %	ARR, pp	RRR, %	RR	CI to RR	*p* (RR)	OR	CI to OR	*p* (OR)
1	Lower-extremity edema	30.00	13.83	16.17	53.90	2.17	1.03-4.56	0.041*	2.67	1.01-7.09	0.049*
2	Dyspnea	32.26	12.77	19.49	60.43	2.53	1.21-5.27	0.013*	3.25	1.24-8.55	0.017*
3	Palpitation	32.43	11.36	21.07	64.96	2.85	1.35-6.02	0.006*	3.74	1.44-9.70	0.007*
4	Diminished heart sounds	32.56	9.76	22.80	70.03	3.34	1.52-7.33	0.003*	4.47	1.69-11.77	0.002*
5	Constellation: "joint pain + diminished heart sounds"	33.33	9.64	23.69	71.08	3.46	1.58-7.59	0.002*	4.69	1.78-12.38	0.002*

As shown in Table 3, the AR (probability) of pericardial effusion in patients with SLE in the presence of lower-extremity edema is 30.0 %, while in the absence of this predictor it is only 13.83 % (ARR 16.17 percentage points, RRR 53.90 %). The RR of pericardial effusion was 2.17 times higher in the presence of lower-extremity edema (95.0% CI 1.03-4.56, $p = 0.041$) and was 2.67 times more common in patients with pericardial effusion (95.0% CI 1.01-7.09, $p = 0.049$), a significant difference was found between the risk/possibility of pericardial effusion in the case of lower-extremity edema and in their absence.

In patients with SLE who have dyspnea, the probability of pericardial effusion is 32.26 %, while in its absence it is 12.77 %. ARR is 19.49 percentage points, RRR is 60.43 %. RR is 2.53 (95.0% CI 1.21-5.27, $p = 0.013$), OR index is 3.25 (95.0% CI 1.24-8.55, $p = 0.017$), the association is significant.

In the presence of complaints of palpitations, the probability of pericardial effusion is 32.43 % vs. 11.36 % in the absence of this symptom. The ARR is 21.07 percentage points, the RRR is 64.96 %. The RR is 2.85 (95.0% CI 1.35-6.02, $p = 0.006$), the OR index is 3.74 (95.0% CI 1.44-9.70, $p = 0.007$), the statistical significance is confirmed.

The AR (probability) of pericardial effusion in patients with SLE in the case of diminished heart sounds is 32.56 %, while in the absence of this predictor it is only 9.76 % (ARR 22.80 percentage points, RRR 70.03 %). The RR is 3.34 (95.0% CI 1.52-7.33, $p = 0.003$), the OR index is 4.47 (95.0% CI 1.69-11.77, $p = 0.002$), where the relationship is statistically significant.

In the presence of the constellation "joint pain + diminished heart sounds", the AR (probability) of pericardial effusion in patients with SLE is 33.33 %, while in the absence of this predictor it is only 9.64 % (ARR 23.69 percentage points, RRR 71.08 %). The RR is 3.46 (95.0% CI 1.58-7.59, $p = 0.002$), the OR index is 4.69 (95.0% CI 1.78-12.38, $p = 0.002$), the reliability of the relationship is confirmed.

Therefore, the predictor constellation "joint pain + diminished heart sounds" has the statistically confirmed optimal predictive power for estimating the likelihood of pericardial effusion in patients with SLE.

Table 4

Prognostic power of clinical predictors in the development of myocarditis in patients with systemic lupus erythematosus (predictive power indicators; *p*; %)

No. i.o.	Clinical predictors / predictor constellation	AR+, %	AR-, %	ARR, pp	RRR, %	RR	CI to RR	*p* (RR)	OR	CI to OR	*p* (OR)
1	Muscle pain	33.33	17.50	15.83	47.50	1.90	1.01-3.58	0.045*	2.36	1.01-5.49	0.047*
2	Alopecia	45.45	15.22	30.24	66.52	2.99	1.62-5.49	<0.001*	4.64	1.91-11.31	0.001*
3	Lower-extremity edema	40.00	18.09	21.91	54.79	2.21	1.19-4.09	0.011*	3.02	1.23-7.42	0.016*
4	Dyspnea	34.88	17.07	17.81	51.06	2.04	1.09-3.83	0.026*	2.60	1.11-6.09	0.028*
5	Palpitation	48.65	12.50	36.15	74.31	3.89	2.04-7.41	<0.001*	6.63	2.69-16.35	<0.001*
6	Systolic murmur at the cardiac apex	28.26	9.09	19.17	67.83	3.11	1.01-9.59	0.048*	3.94	1.11-14.04	0.034*
7	Constellation: "Palpitation + systolic murmur at the cardiac apex"	55.17	13.54	41.63	75.46	4.07	2.23-7.44	<0.001 *	7.86	3.08-20.05	<0.001 *

The results presented in Table 4 show that the AR (probability) of myocarditis in patients with SLE in the case of complaints of muscle pain is 33.33 %, while in the absence of this predictor it is only 17.50 % (ARR 15.83 percentage points, RRR 47.50 %). The RR of myocarditis is 1.90 times higher in the presence of complaint of muscle pain (95.0% CI 1.01-3.58, $p = 0.045$), it was 2.36 times more often recorded in patients with myocarditis (95.0% CI 1.01-5.49, $p = 0.047$), a significant difference was found between the risk/ possibility of myocarditis in the presence of complaint of muscle pain and in its absence.

The presence of alopecia is associated with an increased risk of myocarditis in patients with SLE: AR (probability) is 45.45 %, RR - 2.99 (95.0% CI 1.62-5.49, $p < 0.001$), OR index is - 4.64 (95.0% CI 1.91-11.31, $p = 0.001$); in the absence of this complaint - only 15.22 % (ARR is 30.24 percentage points, RRR is 66.52 %), the reliability of the relationship is confirmed.

The AR (probability) of myocarditis manifestation in patients with SLE in the presence of lower-extremity edema is 40.0 %, while in the absence of this predictor it is 18.09 % (ARR 21.91 percentage points, RRR 54.79 %). The RR is 2.21 (95.0% CI 1.19-4.09, $p = 0.011$), the OR index is 3.02 (95.0% CI 1.23-7.42, $p = 0.016$), where the relationship is statistically significant.

The detection of dyspnea in patients with SLE is associated with an increased risk of myocarditis: AR (probability) is 34.88 %, RR is 2.04 (95.0% CI 1.09-3.83, $p = 0.026$), the OR index is 2.60 (95.0 % CI 1.11-6.09, $p = 0.028$), while in the absence of this complaint it is only 17.07 % (ARR 17.81 percentage points, RRR 51.06 %), the reliability of the relationship has been confirmed.

If the patient has palpitations, the AR (probability) of myocarditis is 48.65 %, while in the absence of this predictor it is 12.50 % (ARR 36.15 percentage points, RRR 74.31 %). RR is equal to 3.89 (95.0% CI 2.04-7.41, $p < 0.001$), OR index is 6.63 (95.0% CI 2.69-16.35, $p < 0.001$), the reliability of the relationship is confirmed.

As a prognostic indicator of myocarditis in patients with SLE, the presence of a systolic murmur at the cardiac apex during examination can be considered, since the AR (probability) is 28.26 % vs. 9.09 % in its absence (ARR 19.17 percentage points, RRR 67.83 %). The RR is equal to 3.11 (95.0% CI 1.01-9.59, $p = 0.048$), the OR index is 3.94 (95.0% CI 1.11-14.04, p 0.034), where a significant relationship is confirmed.

However, the constellation of predictors "palpitation + systolic murmur at the cardiac apex" has a reliably optimal prognostic power, which is associated with the occurrence of myocarditis in patients with SLE. When it is detected, the AR (probability) reaches 55.17 %, the RR is 4.07 (95.0% CI 2.23-7.44, $p < 0.001$), the OR index is 7.86 (95.0% CI 3.08-20.05, $p < 0.001$), while in the absence of a set of these clinical manifestations of the disease it is 13.54 % (ARR 41.63 percentage points, RRR 75.46 %). The reliability of the relationship is confirmed.

It is not possible to determine certain indexes of the predictive power of endocarditis clinical indicators in patients with SLE, nor to establish their statistical significance, due to the very small number of affected patients in the sample (Table 5).

Table 5

Prognostic power of clinical predictors in the development of endocarditis in patients with systemic lupus erythematosus (predictive power indicators; *p*; %)

No. i.o.	Clinical predictors / predictor constellation	AR+, %	AR–, %	ARR, pp	RRR, %	RR	CI to RR	*p* (RR)	OR	CI to OR	*p* (OR)
1	Accentuated second heart sound over the pulmonary artery	16.67	0.00	16.67	–	–	–	–	–	–	–
2	Constellation: "pyrexia + systolic murmur at the cardiac apex + accentuated second heart sound over the aortic area"	100.00	0.00	100.00	–	–	–	–	–	–	–

Note. "–" points to predictive power indicators that cannot be processed statistically.

The study showed that among the clinical indicators, the optimal predictive power for identifying mitral valve insufficiency was provided by the constellation "joint pain + new skin rash + accentuated second heart sound over the aortic area", with an absolute risk (AR) of 93.75 %. For mitral leaflet thickening, the most informative constellation was "dyspnea + sensation of irregular heartbeats", with an AR of 69.23 %. For pericardial effusion, the best predictor constellation was "joint pain + diminished heart sounds", with an AR of 33.33 %. For myocarditis, the constellation "palpitations + systolic murmur at the cardiac apex" demonstrated an AR of 55.17 %. No optimal predictor constellation was identified for endocarditis. A review he available literature showed that some investigators [5, 9] identified key factors (age, arthritis, elevated blood pressure) for predicting cardiac lesion in general. However, no studies were found that examined the association between individual clinical indicators or their constellations and these specific SLE-associated cardiac manifestations.

Conclusions. The optimal prognostic power among clinical predictors for determining the likelihood of mitral valve insufficiency in patients with systemic lupus erythematosus has the constellation "joint pain + new skin rash + accentuated second heart sound over the aortic area", for mitral leaflet thickening, it was the constellation "dyspnea + sensation of irregular heartbeats", for pericardial effusion it was "joint pain + diminished heart sounds", for myocarditis, the best constellation was "palpitations + systolic murmur at the cardiac apex". No predictive constellation was identified for endocarditis.

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Prognostic Power of Clinical Predictors of Syntropical Cardiac Lesions in Patients with Systemic Lupus Erythematosus

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Introduction. Systemic lupus erythematosus (SLE) is a multisystem autoimmune disease frequently associated with cardiac lesion.

The aim of the study. To elucidate the prognostic power of clinical predictors of syntropical cardiac lesions in patients with systemic lupus erythematosus.

Materials and methods. The study included 118 patients with SLE and cardiac manifestations, most of whom were young women. Patients were stratified according to the presence of SLE-associated cardiac lesion. Data were analyzed using Excel; statistical significance was defined as $p < 0.050$. An association was considered confirmed if the association coefficient is ≥0.50 or the contingency coefficient is ≥0.30.

Results. The study identified the predictive power of clinical indicators and determined that the most informative constellation for detecting mitral valve insufficiency was "joint pain + new skin rash + accentuated second heart sound over the aortic area" with an absolute risk (AR) 93.75 %, for mitral leaflet thickening the optimal constellation was "dyspnea + sensation of irregular heartbeats" (AR 69.23 %), for pericardial effusion it was "joint pain + diminished heart soundsv (AR 33.33 %), for myocarditis the best constellation was "palpitations + systolic murmur at the cardiac apex" (AR 55.17 %). No predictive constellation was found for endocarditis.

Conclusions. For each syntropical cardiac lesion in patients with systemic lupus erythematosus, the clinical predictors or their constellations that have optimal prognostic strength, have been elucidated.

Keywords: systemic lupus erythematosus, cardiac lesion, syntropical lesion, clinical predictors, predictive power.

Прогнозна сила клінічних предикторів синтропійних уражень серця у хворих на системний червоний вовчак

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Вступ. Системний червоний вовчак (СЧВ) – мультисистемна автоімунна хвороба, що часто супроводжується ураженням серця. Відомо, що клінічні симптоми окремо або у поєднанні можуть бути ознаками ураження серця у разі СЧВ. Проте не всі клінічні ознаки мають однакову прогнозну силу, тому важливо дослідити їхнє відносне значення. Систематизація таких клінічних предикторів уможливить своєчасно розпізнати хворобу із високим ризиком і розпочати лікування або профілактичні заходи.

Мета. З'ясувати прогнозну силу клінічних предикторів синтропійних уражень серця у хворих на системний червоний вовчак.

Матеріяли й методи. У дослідженні взяли участь 118 хворих на СЧВ із ураженнями серця, серед яких переважно жінки (90,68 %) віком від 18 до 74 років (середній вік 42,48 ± 1,12 року). Хворих стратифікували за наявністю синтропійних уражень серця, тобто тих, частота яких достовірно зростала зі збільшенням ступеня активности СЧВ (недостатність мітрального клапана (НМК), ущільнення мітрального клапана (МК), перикардіяльний випіт, міокардит, ендокардит). Під час дослідження визначали прогнозну силу діягностично

цінних клінічних предикторів і їхніх констеляцій. Фактичний матеріял статистично опрацьовано на персональному комп'ютері в програмах Excel, 2010 і Statistica 6.0. Різницю вважали статистично значущою, якщо $p < 0,050$. Зв'язок підтверджено, якщо коефіцієнт асоціяції ≥0,50 або коефіцієнт контингенції ≥0,30.

Результати. Під час дослідження визначено й оцінено статистичні показники прогнозної сили клінічних предикторів і на основі найвищого значення абсолютного ризику (ймовірности) обрано оптимальний клінічний предиктор чи їхню констеляцію. Отже, ймовірність виникнення НМК за наявности ранкової скутости 57,14 %, нових висипань 54,55 %, задишки 60,47 %, погіршення пам'яти 75,0 %, ослаблення тонів серця 61,29 %, систолічного шуму над верхівкою серця 48,91 %, акценту другого тону над легеневою артерією 75,01 %, констеляції «біль у суглобах + нові висипання + акцент другого тону над аортою» 93,75 %; ущільнення МК – нових висипань 66,67 %, набряків на нижніх кінцівках 57,14 %, задишки 54,76 %, відчуття перебоїв у роботі серця 52,73 %, болю у ділянці серця 63,64 %, ослаблення тонів серця 54,84 %, систолічного шуму над верхівкою серця 42,39 %, констеляції «задишка + відчуття перебоїв у роботі серця» 69,23 %; перикардіяльного випоту – набряків на нижніх кінцівках 30,0 %, задишки 32,26 %, серцебиття 32,43 %, ослаблення тонів серця 32,56 %, констеляції «біль у суглобах + ослаблення тонів серця» 33,33 %; міокардиту – болю у м'язах 33,33 %, алопеції 45,45 %, набряків на нижніх кінцівках 40,0 %, задишки 34,88 %, серцебиття 48,65 %, систолічного шуму над верхівкою серця 28,26 %, констеляції «серцебиття + систолічний шум над верхівкою серця» 55,17 %; для ендокардиту – не виявлено.

Висновки. Для кожного синтропійного ураження серця у хворих на системний червоний вовчак з'ясовано клінічні предиктори або їхні констеляції, які мають оптимальну прогнозну силу.

Ключові слова: системний червоний вовчак, ураження серця, синтропійні ураження, клінічні предиктори, прогнозна сила.

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