



Body mass index, HDL cholesterol, taking NSAID, and current dose of glucocorticoids might contribute to subclinical atherosclerosis in SLE patients with low disease activity

Ju-Yang Jung, Hyoun-Ah Kim, Chang-Hee Suh

Department of Rheumatology, Ajou University School of Medicine, Suwon, Korea

Background

Systemic lupus erythematosus (SLE) patients have increased risk of advanced atherosclerosis and cardiovascular disease. While the mechanism is not completely understood, immunologic deterioration and traditional risk factors such as overweight and dyslipidemia have been regarded to contribute.

Objective

We tried to look for change of subclinical atherosclerosis in SLE patients and analyze the risk factors of CVD and SLE-related characteristics with the variations.

Methods

We assessed carotid artery intima-media thickness (cIMT) and carotid artery plaque by Doppler ultrasonography among sixty-one female SLE patients who were enrolled in the study with subclinical atherosclerosis 4 years ago.

Results

Table 1. Clinical characteristics of patients with SLE

	2010	2014
N	102	61
Age, years	38.6 ± 7.0	38.7 ± 7.5
Hypertension, n (%)	4 (3.92)	4 (6.6)
Family history of CVD, n (%)	22 (21.56)	15 (24.6)
Postmenopausal, n (%)	10 (9.8)	7 (11.5)
Body mass index, kg/m ²	21.0 ± 2.6	21.0 ± 2.8
Waist-hip ratio	0.80 ± 0.06	0.81 ± 0.06
Oral ulcer	17 (16.7)	11 (18)
Malar rash	15 (14.7)	10 (16.4)
Alopecia	17 (16.7)	11 (18)
Arthritis	44 (43.1)	21 (34.4)
Renal disease	14 (13.7)	11 (18)
Hemoglobin, g/dL	12.4 ± 1.4	12.8 ± 1.4
Leukocyte, /μL	5,546 ± 2,037	5,766 ± 2,378
Lymphocyte, /μL	1,615 ± 788	1,698 ± 1,028
Platelet, x10 ³ /μL	217 ± 67.4	220 ± 92.5
Total cholesterol, mg/dL	157.46 ± 31.53	173.2 ± 36.4
Triglyceride, mg/dL	99.42 ± 65.64	112.5 ± 61.7
HDL cholesterol, mg/dL	53.68 ± 14.11	60.5 ± 16.5
LDL cholesterol, mg/dL	83.89 ± 25.28	91.2 ± 29.0
ESR, mm/hr	21.6 ± 18.4	18.0 ± 13.6
CRP, mg/dL	0.14 ± 0.3	0.25 ± 0.79
Complement 3, mg/dL	99.5 ± 27.3	86.8 ± 23.7
Complement 4, mg/dL	20.0 ± 8.0	18.7 ± 7.6
25(OH)D ₃ , ng/mL	12.7 ± 8.6	25.7 ± 6.9
Anti-dsDNA Ab (+)	37 (36.3)	25 (41)
Anticardiolipin Ab (+)	24 (23.5)	10 (16.4)
Lupus anticoagulant (+)	9 (8.8)	4 (6.6)
Disease duration, months	77.4 ± 52.7	84.1 ± 52.4
SLEDAI score	4.4 ± 3.0	4.2 ± 3.9
Hydroxychloroquine use	97 (95.1)	59 (96.7)
NSAID use	31 (30.4)	18 (29.5)
Aspirin use	15 (14.7)	4 (6.6)
Statin use	4 (3.7)	2 (3.3)
ACEI or ARB use	17 (16.7)	17 (27.9)
Steroid current dose, mg	2.6 ± 3.1	4.2 ± 5.5
Steroid cumulative dose, g	10.40 ± 16.91	17.9 ± 25.4
Carotid IMT, mm	0.41 ± 0.08	0.39 ± 0.09
Carotid plaque, n (%)	26 (25.4)	11 (18.0)

SLE: systemic lupus erythematosus, CVD: cardiovascular disease, HDL: high density lipoprotein, LDL: low density lipoprotein, ESR: erythrocyte sedimentation rate, CRP: C-reactive protein, dsDNA: double-strand deoxyribonucleic acid, Ab: antibody, SLEDAI: systemic lupus erythematosus disease activity index, NSAID: non-steroidal anti-inflammatory drugs, ACEI: angiotensin converting enzyme inhibitors, ARB: angiotensin receptor blocker, IMT: intima-media thickness.

Table 2. Comparison between SLE patients who had increased cIMT and those who did not

	Increased cIMT	Not increased cIMT	p-value
N	21	40	
Age, years	36.14 ± 7.8	40.0 ± 7.2	0.06
Hypertension	0	4 (10)	0.14
Family history of CVD	5 (23.8)	10 (24.6)	0.919
Body mass index, kg/m ²	19.8 ± 1.8	21.7 ± 3.1	0.007*
Waist-hip ratio	0.8 ± 0.04	0.8 ± 0.07	0.15
Total cholesterol, mg/dl	162.1 ± 35.9	178.8 ± 35.8	0.08
Triglyceride, mg/dl	94.3 ± 39.2	107.9 ± 83.8	0.77
HDL cholesterol, mg/dl	51.2 ± 13.1	55.4 ± 16.7	0.42
LDL cholesterol, mg/dl	82.8 ± 29.5	95.6 ± 28.2	0.11
ESR, mm/hr	22.7 ± 21.9	19.3 ± 14.3	0.95
CRP, mg/dl	2 ± 0.3	1 ± 0.2	0.84
Complement 3, mg/dl	83.4 ± 24.3	88.4 ± 23.5	0.56
Complement 4, mg/dl	17.2 ± 7.5	19.5 ± 7.6	0.32
25(OH)D ₃ , ng/ml	28.2 ± 6.3	24.1 ± 8.5	0.06
Anti-dsDNA Ab, (+)	10 (47.6)	16 (40.0)	0.57
Anti-cardiolipin Ab, (+)	6 (28.6)	9 (22.5)	0.6
Lupus anticoagulant, (+)	4 (19.0)	2 (5.0)	0.08
Disease duration, months	102.0 ± 42.2	74.8 ± 55.2	0.006*
SLEDAI score	3.8 ± 3.2	4.3 ± 4.3	0.7
NSAID use	3 (14.3)	16 (40.0)	0.04*
Steroid current dose, mg	4.3 ± 6.4	4.1 ± 5.0	0.72
Steroid cumulative dose, g	18.5 ± 21.6	10.5 ± 22.9	<0.001*

Table 3. Multiple regression analysis of cIMT increment and plaque development in SLE patients

	Increased cIMT		Plaque development	
	OR [95%CI]	p-value	OR [95%CI]	p-value
Age	0.957 [0.839 – 1.092]	0.517	1.014 [0.861 – 1.195]	0.867
Body mass index	0.533 [0.34 – 0.835]	0.006*	0.728 [0.416 – 1.266]	0.261
Total cholesterol	0.967 [0.89 – 1.105]	0.428	0.959 [0.856 – 1.074]	0.468
HDL cholesterol	0.937 [0.889 – 0.987]	0.015*	0.925 [0.858 – 0.998]	0.046*
LDL cholesterol	1.009 [0.92 – 1.107]	0.848	1.083 [0.954 – 1.229]	0.218
25(OH)D ₃	1.134 [1.016 – 1.265]	0.025*	0.947 [0.812 – 1.104]	0.8483
Disease duration	0.981 [0.95 – 1.013]	0.235	0.996 [0.9633 – 1.031]	0.832
SLEDAI score	1.128 [0.869 – 1.465]	0.364	1.093 [0.82 – 1.459]	0.544
NSAID use	0.107 [0.013 – 0.887]	0.038*	0.882 [0.038 – 20.288]	0.938
Steroid current dose	0.989 [0.829 – 1.181]	0.903	1.128 [1.003 – 1.267]	0.044*
Steroid cumulative dose	1.0 [1.0 – 1.0]	0.082	1.0 [1.0 – 1.0]	0.958

Conclusions

The follow up study for SLE patients with low disease activity showed low BMI, low HDL cholesterol, and not taking NSAID were associated with cIMT increment. Moreover, current glucocorticoids dose was associated with plaque development. Considered that mean BMI was lower than other studies, obesity paradox in cardiovascular disease risk might support it.