Translational Dermatology

Research Article | Volume 1, Issue 1-2, 2026: 17-21 | Open Access

Echocardiographic Findings in Patients with Alopecia Areata versus Healthy Controls: Is Cardiovascular Risk Truly Elevated or is it Just a Myth?

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Article info:
Received: 15 May 2026
Revised: 20 July 2026
Accepted: 30 July 2026

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ABSTRACT

Due to its inflammatory characteristics, AA may be regarded as a potential risk factor for cardiocerebrovascular events. To address this issue, we conducted a single-center prospective cross-sectional study on 26 adult patients who were clinically diagnosed with AA and 26 age- and sex-matched healthy controls from March 2022 through February 2023. After obtaining informed written consent from all participants, they were referred to the cardiology department for ECG recording and trans-thoracic echocardiography by a qualified echocardiologist using the Philips Healthcare Affinity 70c system with an S1–5 transducer. The study comprised 22 males (11 patients and 11 controls) and 30 females (15 patients and 15 controls). The mean age of the patient group was 41.21 ± 9.14 years, whereas the control group had a mean age of 39.28 ± 8.35 years. We did not find any significant alteration in echocardiographic and electrocardiographic features of patients with AA compared to healthy controls. In conclusion, our results did not indicate the need for prompt cardiac monitoring in AA patients.

Keywords: Electrocardiography; Alopecia Areata; Cardiovascular Risk

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Citation: Aryanian A, Nikkhah A, Shakoei S, Razavi Z, Esmaeli N, Eftekhari MR, Hatami P. Echocardiographic Findings in Patients with Alopecia Areata versus Healthy Controls: Is Cardiovascular Risk Truly Elevated or is it Just a Myth?. Transl Dermatol. 2026;1(1-2):17-21.

https://doi.org/***

Introduction

Alopecia areata (AA) represents one of the most prevalent causes of inflammatory, nonscarring hair loss, with a range of clinical presentations from distinct, well-defined circular patches of hair loss to more extensive forms, such as alopecia totalis, which affects the entire scalp, or alopecia universalis, which impacts the entire body [1-4].

It is believed that the long-term release of cytokines in chronic inflammatory conditions produces metabolic derangements and cardiovascular risk [5-9]. Due to its inflammatory characteristics, AA may be regarded as a potential risk factor for cardiocerebrovascular events. The link between alopecia and coronary heart disease was initially documented more than 60 years ago; however, the evidence is nonetheless inconsistent.

Indeed, most of the existing data focus on cardiovascular risk factors and their incidence among patients with AA, and studies evaluating the occurrence of any cardiovascular abnormality in this group of patients are scarce. Hence, considering AA as an independent risk factor for cardiovascular disorders is still controversial due to lack of sufficient data in this regard. We conducted a single-center prospective cross-sectional study to address this issue.

Material and Methods

This cross-sectional study included 26 adult patients who were clinically diagnosed with AA and 26 age- and sex-matched healthy controls from March 2022 through February 2023 in a tertiary care hospital. Exclusion criteria were having any known dermatological (other than AA for the patient group) or systemic conditions, including diabetes mellitus (DM), hypertension, metabolic syndrome, autoimmune disorder, or any cardiovascular disorder. Pregnant or lactating women and those with a history of smoking or alcohol use were also excluded. After obtaining informed written consent from all participants, they were referred to the cardiology department for ECG recording and trans-thoracic echocardiography by a qualified echocardiologist using the Philips Healthcare Affinity 70c system with an S1–5 transducer.

Results

The study comprised 22 males (11 patients and 11 controls) and 30 females (15 patients and 15 controls). The mean age of the patient group was 41.21 ± 9.14 years, whereas the control group had a mean age of 39.28 ± 8.35 years. The duration of the disease among the patients varied from 1 to 9 years, with an average duration of 1.45 years. The predominant type of disease among the patients was patchy AA, accounting for 84.62%, followed by totalis and universalis AA (7.69% for each type). The severity of disease based on the SALT (Severity of Alopecia Tool) score is presented in Fig. 1. There was no significant difference regarding laboratory test results and physical exam variables between patients and healthy controls (Table 1). Echocardiography findings in both groups are reported in Table 2.

According to our results, echocardiographic findings regarding atrial and ventricular function, pulmonary arterial pressure, Doppler tissue imaging, and valvular function, as well as electrocardiographic findings regarding early repolarization, ectopic premature complexes, bundle branch blocks, axis deviation, T wave abnormalities, and P wave dispersion were not significantly different between patients and controls (data not shown).

Discussion

Based on our results, patients with AA were not directly at increased risk for adverse cardiovascular events, which is in line with the results of a recent study in which data from 995 patients with AA were analyzed and compared to the normal population. They found that, in contrast to chronic kidney disorder and hyperlipidemia, cardiovascular events are not more prevalent in patients

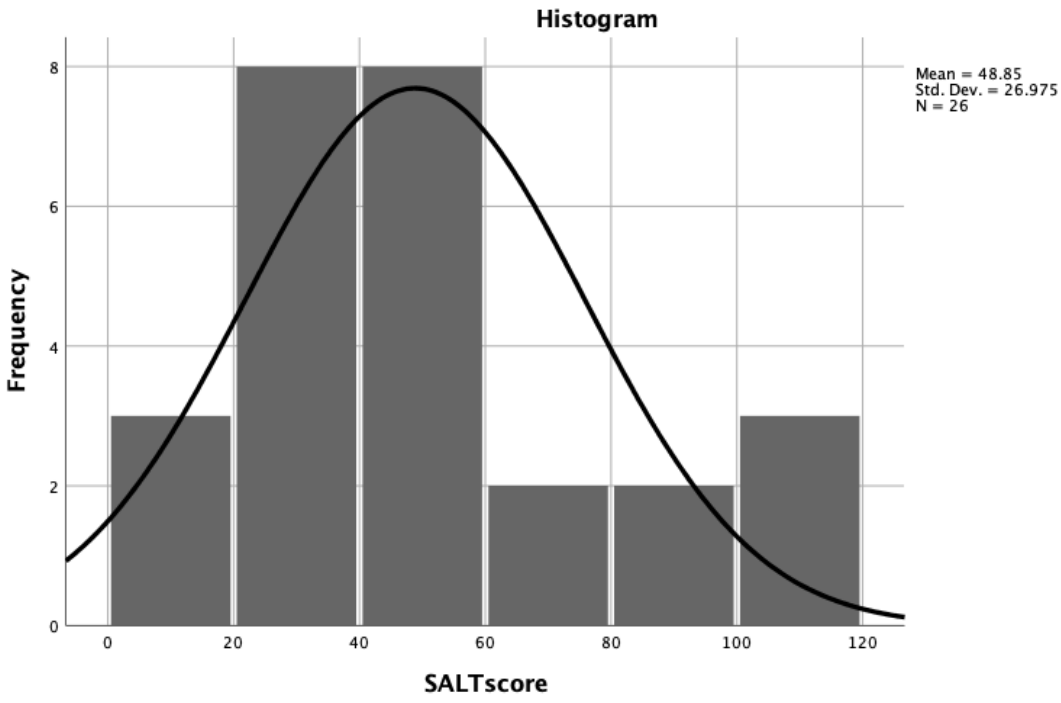

Fig. 1. SALT score among patients.

Table 1. Laboratory and examination characteristics of patients (P) and controls (C).

	Group	Mean ± SD	P-value*
Cigarette pack year	P	1.92 ± 4.70	.649
	C	1.35 ± 4.37	
FBS (mg/dL)	P	93.15 ± 11.27	.052
	C	86.85 ± 11.55	
Total Cholestrol (mg/dL)	P	179.50 ± 36.65	.103
	C	160.73 ± 44.35	
Triglyceride (mg/dL)	P	122.77 ± 52.20	.198
	C	105.88 ± 40.39	
HDL (mg/dL)	P	51.88 ± 13.06	.258
	C	48.42 ± 8.14	
LDL (mg/dL)	P	106.44 ± 29.76	.268
	C	98.58 ± 19.42	
TSH (mg/dL)	P	1.99 ± .89	.817
	C	2.05 ± .78	
ALT (Unit/L)	P	27.19 ± 12.03	.574
	C	25.53 ± 8.81	
AST (Unit/L)	P	22.57 ± 5.54	.405
	C	21.38 ± 4.65	
ALP (Unit/L)	P	169.07 ± 50.49	.278
	C	154.26 ± 46.79	
Cr (mg/dL)	P	1.046 ± .25	.374
	C	.96 ± .35	
WBC (K/µL)	P	6.39 ± 1.34	.043
	C	5.70 ± .99	
Hb (g/dL)	P	14.05 ± 1.65	.024
	C	15.00 ± 1.25	
Plt (K/µL)	P	272.42 ± 65.04	.045
	C	312.23 ± 74.41	
Systolic Blood Pressure (mmHg)	P	127.85 ± 14.38	.750
	C	126.54 ± 15.01	
Diastolic Blood Pressure (mmHg)	P	78.69 ± 7.78	.434
	C	76.73 ± 9.99	
Heart Rate (Beat/min)	P	76.65 ± 17.95	.544
	C	79.46 ± 15.07	
Height (cm)	P	167.85 ± 9.90	.540
	C	169.35 ± 7.46	
Weight (kg)	P	71.07 ± 11.59	.866
	C	71.57 ± 9.60	

Independent t test*

with AA [10]. In fact, although the psychosocial effects of AA are well-documented, its influence on internal diseases, particularly cardiovascular disease (CVD), remains inadequately understood.

Singdia et al. [11] found that the prevalence of metabolic syndrome (MS) was nearly identical in individuals with AA (9 out of 106 cases, 8.47%) and in healthy controls (8 out of 106 cases, 7.54%), with no statistically significant difference observed (p = 1.00). They did not find any significant difference regarding SBP and DBP between patients with AA and controls, which is in line with our results.

Table 2. Echocardiography findings with among patients (P) and controls (C).

Variable	Group	Median/ Mean ± SD	P value	Variable	Group	Median/ Mean ± SD	P value
LVEF (%)	P	55	0.185	RVS vel (cm/s)	P	12.00	0.896
	C	55			C	13.00	
LVESD (cm)	P	3.03 ± 0.45	0.057	TAPSE (mm)	P	22.00	
	C	3.23 ± 0.23			C	24.25	0.211
LVEDV (ml)	P	98.60 ± 29.64	0.108	RV Base (mm)	P	33.78 ± 5.23	0.875
	C	102.34 ± 26.55			C	34.54 ± 2.34	
LVS sept	P	7.27 ± 1.38	0.884	RV mid (mm)	P	25.89 ± 4.37	0.264
	C	7.19 ± 1.41			C	26.43 ± 4.4	
LVS lat	P	9.12 ± 2.47	0.787	RV length (mm)	P	70.23 ± 8.76	0.291
	C	9.36 ± 2.08			C	72.87 ± 5.35	
LVEDD (cm)	P	4.60	0.21	PAP sys (mmHg)	P	22.34 ± 3.29	0.386
	C	5.05			C	23.55 ± 2.18	
PWT (cm)	P	0.70	0.408	PAP mean (mmHg)	P	15.48 ± 2.38	00.666
	C	0.70			C	15.49 ± 2.18	
IVS (cm)	P	0.70	0.676	DTI Es (cm/s)	P	8.59 ± 2.02	0.151
	C	0.75			C	9.10 ± 1.23	
LAD (cm)	P	2.78 ± 0.57	0.613	DTI As (cm/s)	P	8.87 ± 2.34	0.877+
	C	2.87 ± 0.27			C	8.98 ± 1.23	
LAA	P	15.35 ± 2.62	0.195	DTI EI (cm/s)	P	12.56 ± 2.19	0.189
	C	16.58 ± 3.70			C	13.28 ± 2.22	
LAvol (ml/m^2)	P	39.00 ± 12.27	0.752	DTI AI (cm/s)	P	8.89 ± 2.95	0.324
	C	40.15 ± 11.23			C	9.54 ± 2.12	

Trieu et al. [12] conducted a meta-analysis on 31 studies involving 29,254 participants and found a significant association between alopecia and an elevated risk of coronary heart disease (OR 1.22, 95% CI: 1.07–1.39), hyperinsulinemia (OR 1.97, 95% CI: 1.20–3.21), insulin resistance (OR 4.88, 95% CI: 2.05–11.64), and metabolic syndrome (OR 4.49, 95% CI: 2.36–8.53). Furthermore, individuals with alopecia exhibited a higher likelihood of having elevated serum cholesterol levels (OR 1.60, 95% CI: 1.17–2.21), increased serum triglyceride levels (OR 2.07, 95% CI: 1.32–3.25), as well as higher systolic blood pressures (OR 1.73, 95% CI: 1.29–2.33) and diastolic blood pressures (OR 1.59, 95% CI: 1.16–2.18), which is not congruent with our results. This discrepancy might be due to their selection criteria and our restricted recruitment criteria, as well as the low number of our patients, which was the main limitation of our study.

Another explanation for our findings could be that we excluded subjects with a known diagnosis of DM, HTN, and metabolic syndrome, which are undoubtedly linked to an elevated risk of cardiovascular events. Moreover, our patients were relatively young, and this might have an impact on our findings. A recent study revealed that patients with AA exhibited a significantly higher prevalence of subclinical atherosclerosis at 54.7%, in contrast to 22.6% among healthy controls ($p = 0.010$). Notably, AA patients with atherosclerotic plaques were found to be older ($p < 0.001$) and had a longer duration since their AA diagnosis ($p = 0.11$), which indicates the importance of duration of systemic inflammation on developing atherosclerosis [13].

To the authors' knowledge, there have been no prior publications addressing detailed echocardiographic findings in patients with AA, making this study the first to highlight these findings among affected individuals.

Conclusion

The authors did not find any significant alteration in echocardiographic and electrocardiographic features of patients with AA compared to healthy controls, but they noted that further prospective studies with randomization need to be performed to validate their results. Although their findings did not indicate the need for prompt cardiac monitoring in AA patients, the authors suggested that the inflammatory characteristics

associated with certain subtypes of AA may highlight the importance of lifestyle modifications and regular health screenings for those at risk, as these measures could potentially mitigate the likelihood of cardiovascular diseases.

Acknowledgments

The authors would like to thank the Razi Hospital Clinical Research Development Center and the Autoimmune Bullous Diseases Research Center for their technical and editorial assistance.

Funding

We received no funding for this project.

Declaration of Conflicting Interests

All the authors declare that there is no conflict of interest.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Authors' contributions

S.S., Z.R., N.E. and M.E. performed the research. Z.A., P.H. and A.N. designed the research study. Z.A. and N.E. supervised the project. Z.R., M.E. and A.N. analyzed the data. P.H. and S.S. wrote the paper.

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