HCQ group was borderline noninferior to that in the doxycycline group (78.57% vs 70.00%, $P = .052$).

During the study, 18 patients reported 31 adverse events, and the proportion of patients with adverse events was low and similar between the HCQ (28.5%) and doxycycline (33.3%) groups. The most common adverse events were dry skin (14.3%), dry eye (7.1%), and dizziness (7.1%) in HCQ group and dry skin (16.7%) and flatulence (10.0%) in doxycycline group. Only 1 patient in the doxycycline group discontinued treatment owing to a severe adverse event (thrombocytopenia). During the follow-up of 12 weeks, there were 4 cases of recurrence in the HCQ group and 3 in the doxycycline group.

This study had some limitations, including the small sample size and the fact that some outcomes could not reach conclusive noninferior inference.

To conclude, this preliminary study suggested that HCQ can produce improvement of rosacea. Considering the general safety of HCQ during pregnancy, it can be better promoted in female patients with rosacea. Our findings should be replicated in studies with larger populations.

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REFERENCES

1. Gallo RL, Granstein RD, Kang S, et al. Standard classification and pathophysiology of rosacea: the 2017 update by the National Rosacea Society Expert Committee. *J Am Acad Dermatol*. 2018;78(1):148-155.
2. van Zuuren EJ, Fedorowicz Z, Tan J, et al. Interventions for rosacea based on the phenotype approach: an updated systematic review including GRADE assessments. *Br J Dermatol*. 2019;181(1):65-79.
3. van der Linden MMD, van Ratingen AR, van Rappard DC, Nieuwenburg SA, Spuls PI. DOMINO, doxycycline 40 mg vs. minocycline 100 mg in the treatment of rosacea: a randomized, single-blinded, noninferiority trial, comparing efficacy and safety. *Br J Dermatol*. 2017;176:1465-1474.
4. Frances C, Cosnes A, Duhaut P, et al. Low blood concentration of hydroxychloroquine in patients with refractory cutaneous lupus erythematosus: a French multicenter prospective study. *Arch Dermatol*. 2012;148:479-484.
5. Costedoat-Chalumeau N, Amoura Z, Huong DL, Lechat P, Piette JC. Safety of hydroxychloroquine in pregnant patients with connective tissue diseases. Review of the literature. *Autoimmun Rev*. 2005;4:111-115.

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The role of thymus and activation-regulated chemokine as a marker of severity of atopic dermatitis

To the Editor: Serum thymus and activation-regulated chemokine (TARC) is reported to be an objective biomarker of the severity of atopic dermatitis (AD), with a high sensitivity and specificity.[1-3] To study these aspects, 103 case

Table I. Mean and median TARC values among case patients and control individuals

Age group, y	Normal TARC level,[4] pg/mL	Case patients (N = 103)				Control individuals (N = 70)			
		n	Mean (SD)	Median (IQR)	Number with elevated TARC (%)	n	Mean (SD)	Median (IQR)	Number with elevated TARC (%)
<1	<1367	10	1186.9 (823.7)	993.5 (447.5-1892.5)	4 (40)	10	1064.8 (475.5)	1117.5 (712.5-1440)	3 (30)
1-2	<998	15	814.4 (678.6)	703.0 (316-968)	2 (13.3)	12	531.17 (236.6)	532.5 (276.2-711.5)	0 (0)
>2	<743	78	830.6 (795.2)	467.5 (249.75-1292)	27 (34.6)	48	420.5 (474.1)	249.5 (162.3-396)	7 (14.6)
Total		103			33 (32)	70			10 (14.3)

IQR, Interquartile range; *SD*, standard deviation; *TARC*, thymus and activation-regulated chemokine.

Table II. Pearson correlation coefficient (*r*) between serum TARC levels and SCORAD index, QOL indices, and other biomarkers

Parameter	<1 year			1-2 years			>2 years		
	n	*r* (95% CI)	*P*	n	*r* (95% CI)	*P*	n	*r* (95% CI)	*P*
SCORAD index	10	0.320 (−0.39 to 0.79)	.367	15	−0.230 (−0.66 to 0.32)	.410	78	**0.538 (0.36 to 0.68)**	**<.001**
IDQOL	10	0.391 (−0.32 to 0.82)	.263	15	−0.190 (−0.64 to 0.36)	.497	10	**0.823 (0.40 to 0.96)**	**.003**
CDLQI	NA	NA		NA	NA		68	**0.380 (0.16 to 0.57)**	**.001**
Peripheral eosinophil count	10	−0.083 (−0.68 to 0.58)	.819	15	0.162 (−0.38 to 0.62)	.565	78	**0.583 (0.41 to 0.71)**	**<.001**
LDH	10	−0.549 (−0.88 to 0.12)	.100	13	0.440 (−0.15 to 0.80)	.133	66	**0.550 (0.36 to 0.70)**	**<.001**
IgE	9	0.510 (−0.23 to 0.88)	.161	13	0.094 (−0.48 to 0.61)	.759	74	0.169 (−0.06 to 0.38)	.150

The significant correlations are highlighted in bold ($P < .05$).
CDLQI, Children's Dermatology Life Quality Index; *CI*, confidence interval; *IDQOL*, Infants' Dermatitis Quality of Life; *Ig*, immunoglobulin; *LDH*, lactate dehydrogenase; *NA*, not applicable; *QOL*, quality of life; *SCORAD*, Scoring Atopic Dermatitis; *TARC*, thymus and activation-regulated chemokine.

patients (65 boys, 38 girls) with AD aged 16 years or younger (mean ± standard deviation, 6.06 ± 4.05 years) diagnosed based on the UK Working Party Diagnostic Criteria were prospectively recruited from December 2016 to June 2018. In addition, 70 control individuals (38 boys, 32 girls) aged 16 years or younger (mean ± standard deviation, 6.52 ± 5.18 years) with diseases mimicking AD (psoriasis, n = 23; scabies, n = 15; impetigo, n = 15; contact dermatitis, n = 10; and seborrheic dermatitis, n = 7) were recruited randomly during the same period. Severity and quality of life (QOL) were assessed by the Scoring Atopic Dermatitis (SCORAD) index and the Infants' Dermatitis QOL or Children's Dermatology Life Quality Index (CDLQI). Serum TARC was measured using Abcam's Human ELISA kit (Abcam, Cambridge, UK) and evaluated on the basis of normal values published earlier.[4] Peripheral eosinophil count, immunoglobulin (Ig) E, and lactate dehydrogenase (LDH), were measured in 103, 96, and 89 case patients, respectively. Patch tests for standard allergens were not routinely done. Data were entered in EpiData, version 3.1 (The EpiData Association, Odense, Denmark), and analyzed with SPSS, version 21.0 (IBM, Armonk, NY). A receiver operating characteristic (ROC) curve was plotted for the optimal cutoff value for TARC in case patients.

The age-specific mean and median (interquartile range [IQR]) TARC values in case patients and control individuals are shown in Table I. The median (IQR [range]) TARC value in case patients was 519 pg/mL (299-1284 pg/mL [14-2503 pg/mL]) and 319 pg/mL (195.75-748.75 pg/mL [46-2500 pg/mL]) in control individuals ($P = .002$). Among control individuals, it was elevated in psoriasis (4/23), scabies (2/15), seborrheic dermatitis (2/7), contact dermatitis (1/10), and impetigo (1/15). The sensitivity, specificity, and positive and negative likelihood ratios were 57.7%, 72.3%, 2.08, and 0.59, respectively. By using the ROC curve, a cutoff value of 365 pg/mL was obtained in case patients older than 2 years (n = 78).

The sensitivity, specificity, and positive and negative likelihood ratios were 57.7%, 72.3%, 2.08, and 0.59, respectively. (ROC curves were not plotted for case patients aged 2 years or younger because of the small numbers.)

There was significant correlation of serum TARC levels with the SCORAD index ($r = 0.538$; 95% confidence interval [CI], 0.36-0.68), QOL indices (Infants' Dermatitis QOL: $r = 0.823$; 95% CI, 0.40-0.96; Children's Dermatology Life Quality Index: $r = .380$; 95% CI, 0.16-0.57), peripheral eosinophils, and LDH in children older than 2 years but not in the younger age groups (Table II). The correlation with IgE was not significant. In the same age group, for SCORAD index, the correlation was highest with LDH ($r = 0.582$; 95% CI, 0.40-0.72), followed by serum TARC ($r = 0.538$; 95% CI, 0.36-0.68), peripheral eosinophils ($r = 0.397$; 95% CI, 0.19-0.57), and serum IgE ($r = 0.331$; 95% CI, 0.11-0.52). In concurrence with previous studies, our results suggest that TARC correlates with the severity of AD and QOL indices.[1,5] The sensitivity and specificity were lower than those previously reported (83%-85% and 92%-96%, respectively), possibly due to choosing control individuals with diseases mimicking AD and the use of different enzyme-linked immunosorbent assay systems.[2,4] The latter may also explain the lower cutoff for TARC obtained in this study. Contrary to the report of a meta-analysis, SCORAD index correlated highest with LDH, followed by TARC.[1] Compared to LDH, a nonspecific inflammatory marker, TARC is more specific but expensive.[1] The clinical utility of TARC in distinguishing between AD and its mimics is limited by the low specificity and sensitivity. However, the study highlights its role as an objective marker for disease severity.

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REFERENCES

1. Thijs J, Krastev T, Weidinger S, et al. Biomarkers for atopic dermatitis: a systematic review and meta-analysis. *Curr Opin Allergy Clin Immunol*. 2015;15(5):453-460.
2. Fujisawa T, Nagao M, Hiraguchi Y, et al. Serum measurement of thymus and activation-regulated chemokine/CCL17 in children with atopic dermatitis: elevated normal levels in infancy and age-specific analysis in atopic dermatitis. *Pediatr Allergy Immunol*. 2009;20(7):633-641.
3. Hijnen D, De Bruin-Weller M, Oosting B, et al. Serum thymus and activation-regulated chemokine (TARC) and cutaneous T cell- attracting chemokine (CTACK) levels in allergic diseases: TARC and CTACK are disease-specific markers for atopic dermatitis. *J Allergy Clin Immunol*. 2004;113(2):334-340.
4. Kataoka Y. Thymus and activation-regulated chemokine as a clinical biomarker in atopic dermatitis. *J Dermatol*. 2014;41(3):221-229.
5. Haeck IM, ten Berge O, van Velsen SGA, de Bruin-Weller MS, Bruijnzeel-Koomen CAFM, Knol MJ. Moderate correlation between quality of life and disease activity in adult patients with atopic dermatitis: quality of life and disease activity in AD. *J Eur Acad Dermatol Venereol*. 2012;26(2):236-241.

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One-year real-world clinical effectiveness, safety, and laboratory safety of dupilumab in Japanese adult patients with atopic dermatitis: A single-center retrospective study

To the Editor: Dupilumab has demonstrated good efficacy and tolerable safety in adult patients with moderate to severe atopic dermatitis in the long term in clinical trials,[1] but real-world long-term data are limited. The Asian atopic dermatitis phenotype differs from the European American atopic dermatitis phenotype by demonstrating increased T helper cell type 17 polarization in addition to T helper cell type 2 skewing,[2] suggesting a difference in responsiveness to dupilumab. We analyzed our 1-year actual data on Japanese adult atopic dermatitis patients treated with dupilumab.

All atopic dermatitis patients who initiated dupilumab from June 2018 to August 2019 and were treated with dupilumab for more than 3 months at our hospital as of December 1, 2019, were included in this study. Dupilumab is approved in