

C L I N I C A L E V A L U A T I O N • W I T H I N - S U B J E C T P A I R E D D E S I G N

Efficacy of a Lamellar AR Moisturizing Cream on Skin Barrier Function in Atopic Dermatitis

*A 2-week, randomized, split-body, controlled clinical evaluation
of Transepidermal Water Loss (TEWL) and Stratum Corneum Hydration*

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N = 36 • Split-body design • Repeated-measures ANOVA

A p r i l 2 0 2 6

Rationale & Clinical Hypothesis

The skin barrier in atopic dermatitis

H1 — Within-group

The AR-treated side will show a significant decrease in TEWL and increase in water content after 2 weeks.

↓ *TEWL* ↑ *Hydration*

H2 — Between-group

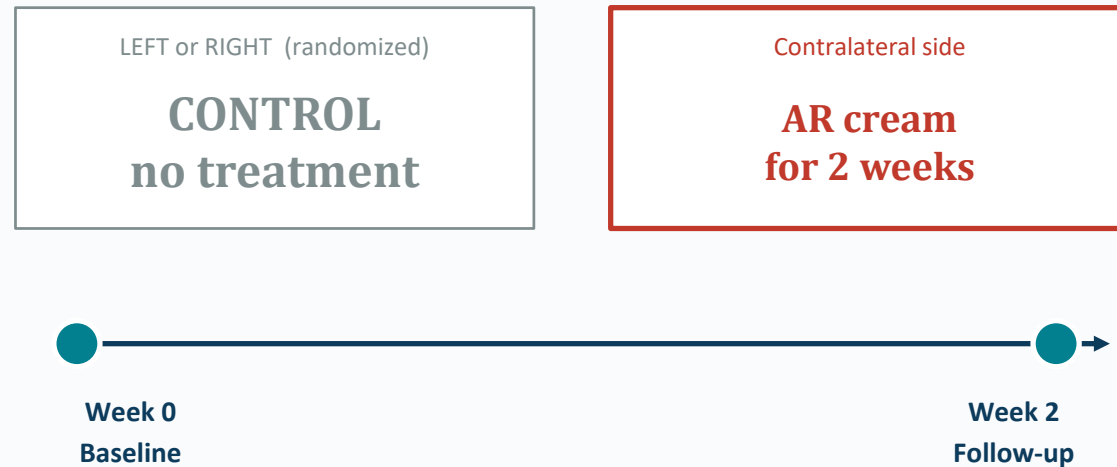
The magnitude of improvement on the AR side will significantly exceed that of the contralateral Control side (Group × Time interaction).

$\Delta(AR) > \Delta(Ctrl)$

STUDY AIM To quantify the objective change in stratum corneum barrier and hydration after 2 weeks of AR cream application, using the contralateral side as an intra-subject control.

Study Design & Measurements

Split-body, within-subject 2 × 2 design



Objective measurements (Corneometer CK)

TEWL $g/m^2/h$

Transepidermal water loss — barrier integrity

↓ improvement

Stratum Corneum *Water Content*

Hydration of the outermost epidermis

↑ improvement

ANALYSIS 2 × 2 repeated-measures ANOVA • Paired t-test (normality OK) / Wilcoxon signed-rank (TEWL Δ non-normal) • Cohen's d_z

Study Population & Descriptive Statistics

36

Patients with atopic dermatitis

144

Paired measurements
(36 × 2 sides × 2 visits)

2 wks

Treatment duration
(BID application)

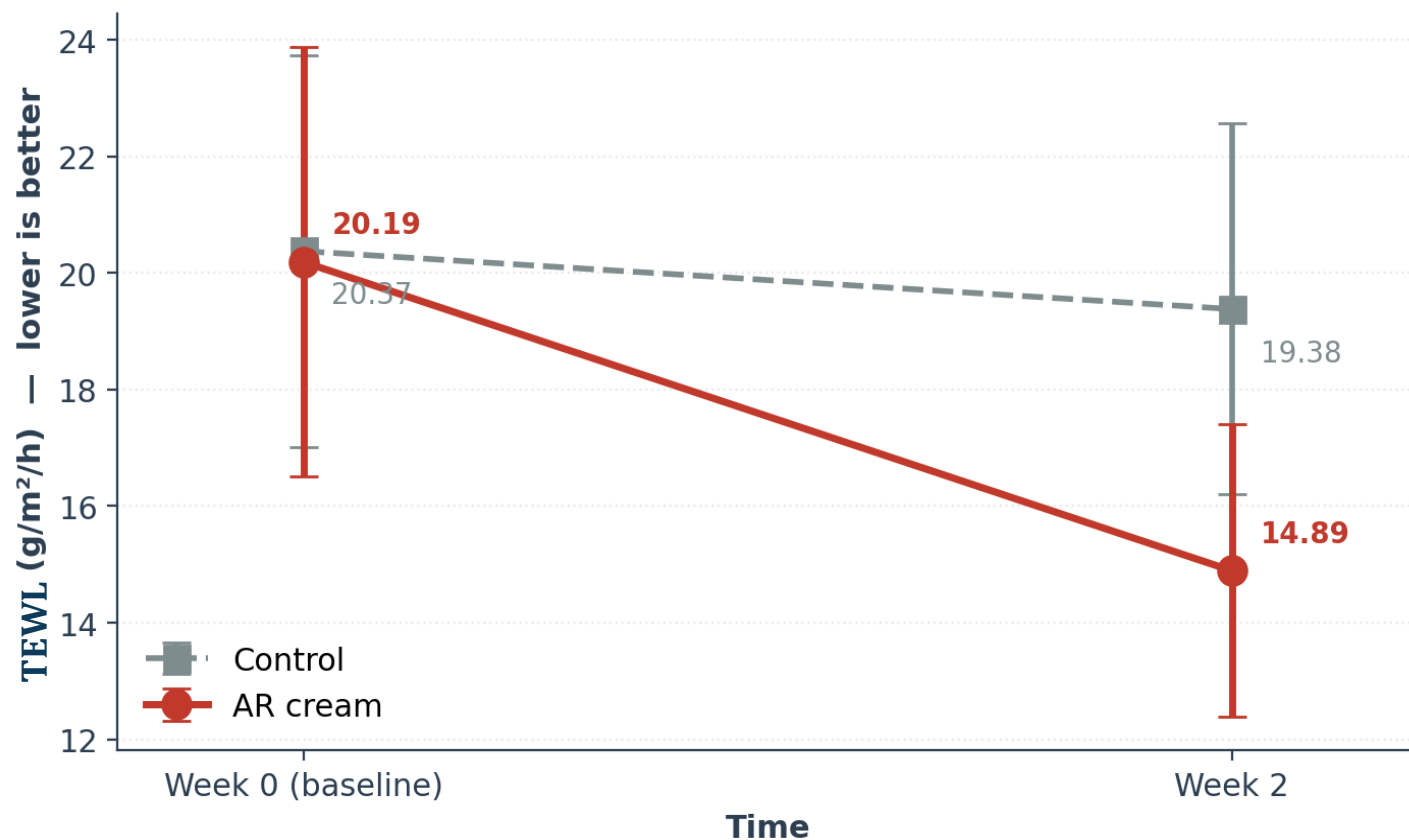
Mean ± SD by group × time

Outcome	Group	Week 0	Week 2	Δ (W2 – W0)
TEWL (g/m ² /h)	Control	20.37 ± 9.80	19.38 ± 9.70	–0.99
	AR	20.19 ± 10.31	14.89 ± 7.74	–5.30
Water Content	Control	14.34 ± 7.11	14.13 ± 7.35	–0.21
	AR	15.51 ± 7.99	20.82 ± 8.47	+5.31

Note. Data are mean ± standard deviation. Δ = change from Week 0 to Week 2. Bold highlights treatment-side improvement.

TEWL — Significant Reduction on AR Side

TEWL : Group × Time Interaction



KEY FINDINGS

-26%

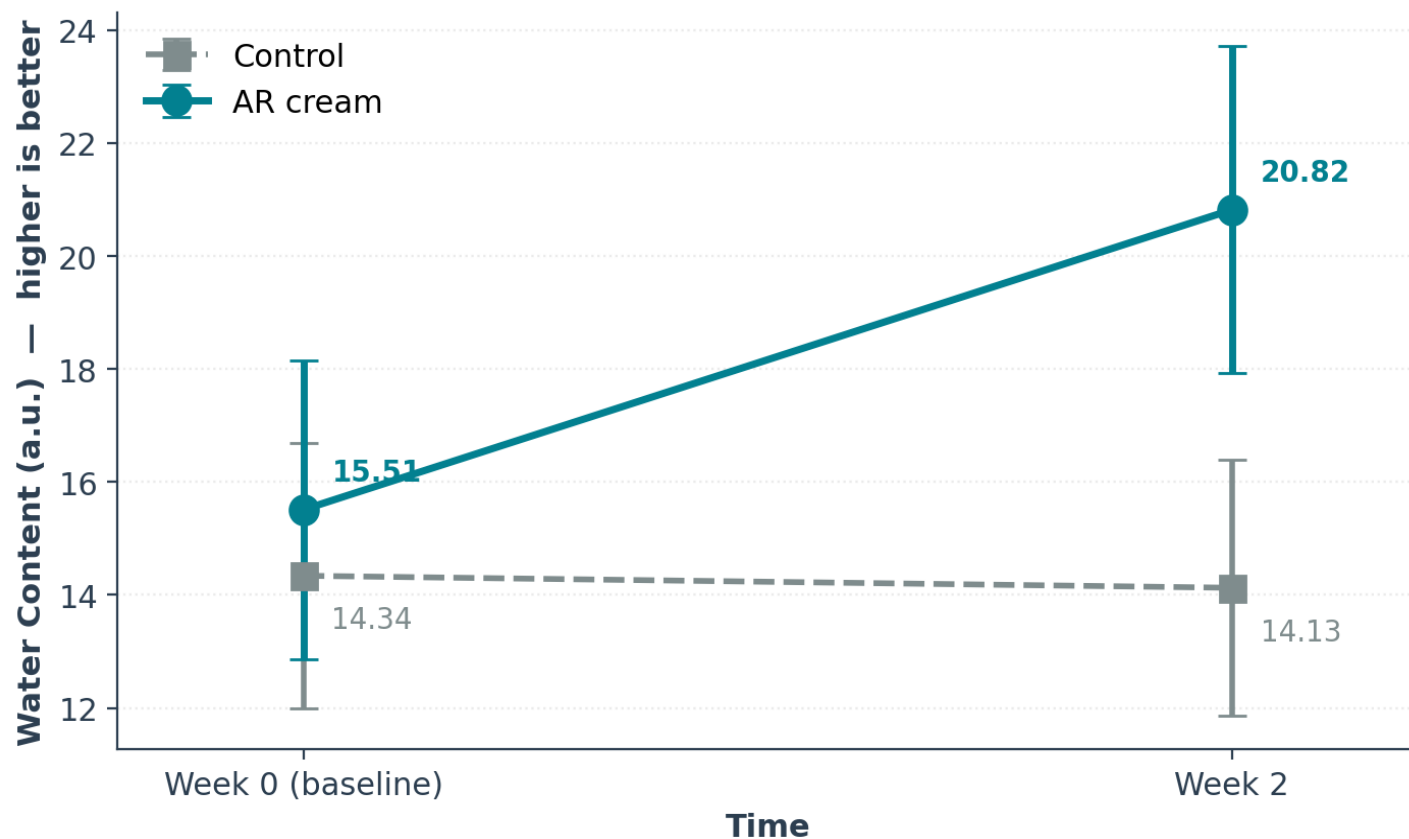
relative reduction in TEWL on the AR side (20.19 → 14.89)

Mean change AR side	-5.30
Paired t (35)	-4.99
p-value	< .001
Cohen's d _z	0.83 (large)
Wilcoxon signed-rank	p < .001

INTERPRETATION The skin-barrier-disrupted AD patients showed a clinically meaningful reduction in TEWL after 2 weeks of AR cream, while the contralateral Control side remained unchanged (p = .371).

Hydration — Significant Increase on AR Side

Stratum Corneum Water Content: Group × Time



KEY FINDINGS

+34%

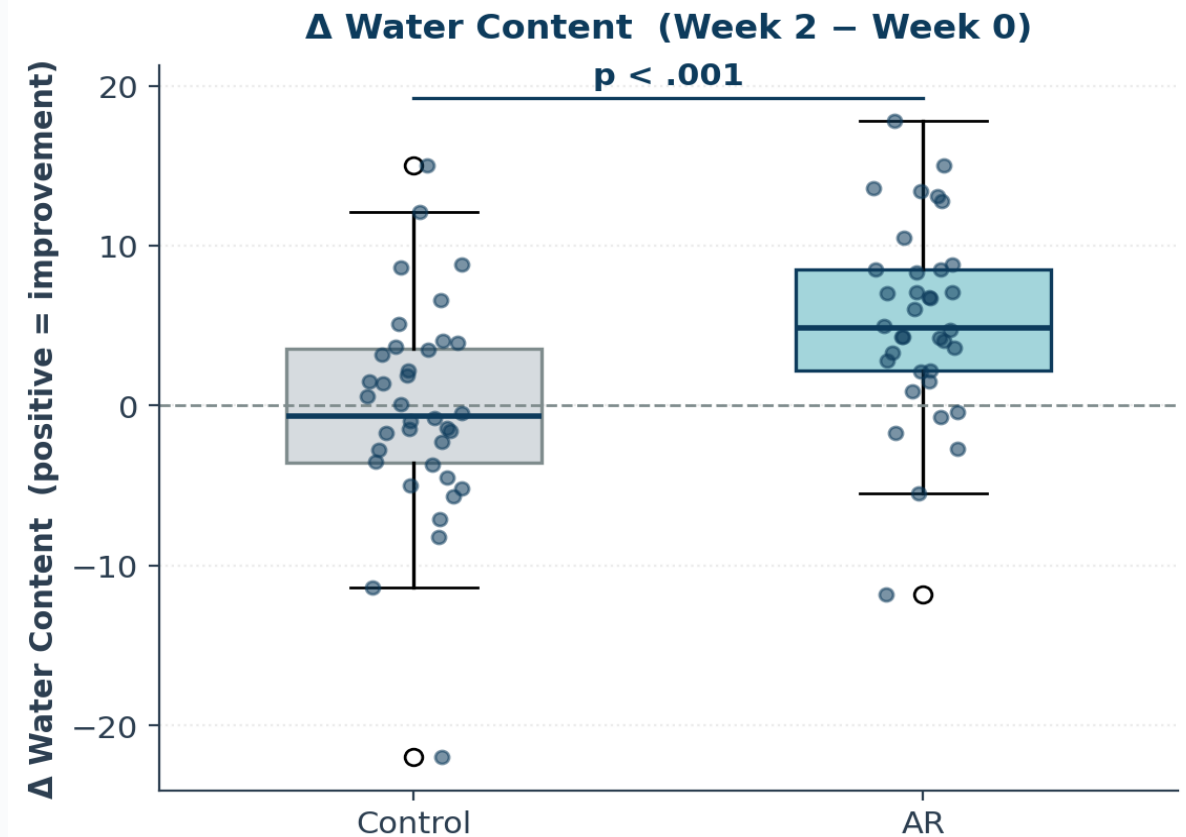
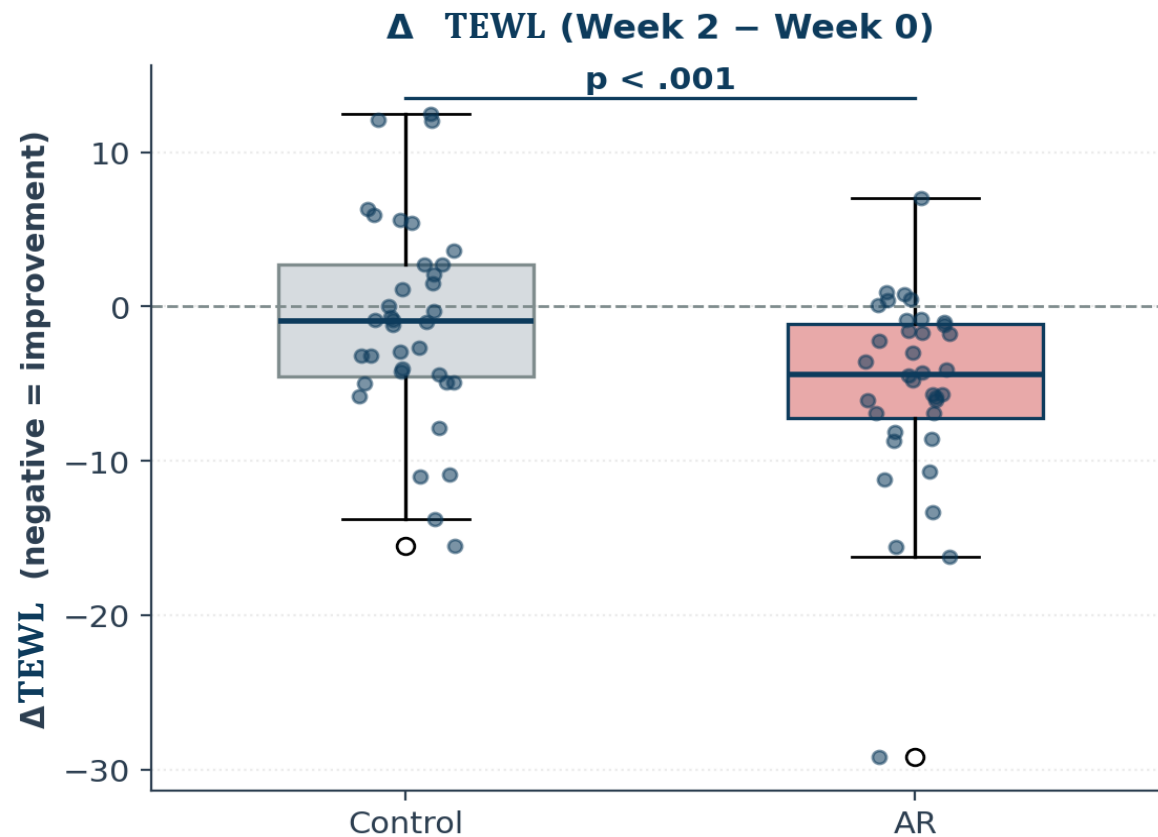
relative increase in water content on the AR side (15.51 → 20.82)

Mean change AR side	+5.31
Paired t (35)	+5.34
p-value	< .001
Cohen's d _z	0.89 (large)
Shapiro-Wilk (Δ)	p = .659 ✓

INTERPRETATION

Stratum corneum hydration improved markedly on the AR side, whereas the Control side stayed essentially flat ($p = .849$), supporting a lipid-replenishing barrier-repair mechanism.

Group × Time Interaction Is Significant for Both Outcomes



2 × 2 REPEATED - MEASURES ANOVA

TEWL Group×Time $F(1,35) = 13.83, p < .001$ | Water Content Group×Time $F(1,35) = 28.51, p < .001$

Clinical Implications & Study Strengths

What this study shows

01

Robust within-subject control

Each patient is their own control (contralateral side), removing between-subject variability and substantially increasing statistical power.

02

Objective, instrument-based outcomes

TEWL and stratum corneum hydration are quantitative, reproducible endpoints
— not subjective scores.

03

Consistent, directional effects

Large effect sizes ($d_z = 0.83$ and 0.89) and a significant Group $\times$ Time interaction for both outcomes support a true cream effect over natural variation.

LIMITATIONS & NEXT STEPS

- **Short duration (2 weeks)**
— durability of barrier repair remains to be demonstrated.
- **TEWL Δ non-normal**
— Wilcoxon signed-rank reported alongside t-test; conclusions agree.

CONCLUSION

AR lamellar cream restores skin-barrier function and hydration in atopic dermatitis within 2 weeks.

-26%

TEWL on AR side

+34%

Hydration on AR side

$p < .001$

Group × Time interaction
(both outcomes)

Objective instrument-based evidence • Within-subject design • Large effect sizes

Thank you — Questions?