International Journal of Research in Dermatology
Vaishnav J et al. Int J Res Dermatol. 2026 Nov;12(6):568-579
https://www.ijord.com

DOI: https://dx.doi.org/10.18203/issn.2455-4529.IntJResDermatol20263680

Original Research Article

Efficacy and safety of MemBio™ intense moisturizer: barrier repair beyond hydration

Jaimin Vaishnav[1]*, Dhruv Zaveri[1], Sunil S. Iyer[1], Nakul Patel[2], Vinay Upadhyay[2], Ritu Laddha[3], M. E. Kannan[4]

[1]Biopharmaceutics and Clinical Development, Pharmaceutical Technology Centre (PTC), Zydus Lifesciences Limited, Moriya, Ahmedabad, Gujarat, India
[2]Formulation Department, Pharmaceutical Technology Centre (PTC), Zydus Lifesciences Limited, Block no. 2, 3, 4, 5, Moriya, Ahmedabad, Gujarat, India
[3]Formulation Department, Pharmaceutical Technology Centre (PTC), Zydus Lifesciences Limited, Moriya, Ahmedabad, Gujarat, India
[4]Pharmaceutical Technology Centre (PTC), Zydus Lifesciences Limited, Moriya, Ahmedabad, Gujarat, India

Received: 03 September 2026
Accepted: 17 September 2026

***Correspondence:**
Jaimin Vaishnav,
E-mail: Jaimin.Vaishnav@ZydusLife.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Dry skin is characterized by epidermal barrier dysfunction and depletion of stratum corneum lipids, leading to decreased hydration and increased transepidermal water loss (TEWL). MemBio™ Intense Moisturizer (test product) was evaluated for clinical efficacy and safety in dry to severely dry skin.
Methods: This single-center, open-label moisture-kinetic study enrolled 26 healthy adults with dry to severely dry skin. The test product was applied to a designated forearm site while the contralateral forearm served as untreated control. Efficacy assessment included skin hydration (corneometer), skin barrier function (TEWAmeter), restore skin barrier damage, skin glow (Glossymeter), skin surface characteristics (skin smoothness, dryness, roughness, scaliness wrinkles), Desquamation Index and skin and facial photographic imaging. Measurements were performed at baseline and post application of the test product at 20 minutes on Day 1, 2, 7 and 15. Subjective perceptions of product performance and tolerability, as well as safety evaluations were recorded throughout the study period.
Results: The test product produced instant hydration within 20 minutes, maintained hydration for 24 hours, and demonstrated sustained efficacy through Day 15. Hydration increased by 129.25% at right cheek and 136.02% at tape-stripped site, while skin barrier function improved by 23.87% and 21.44%, respectively ($p<0.0001$). Significant improvements were also observed in skin surface characteristic (smoothness, dryness, roughness, scaliness wrinkles), desquamation index, and skin shine. No adverse events were observed during the study
Conclusions: MemBio™ Intense Moisturizer significantly improved hydration, skin surface characteristics and restored epidermal barrier function, supporting its use as an effective daily moisturizer for dry to severely dry skin.

Keywords: Dry skin, MemBio™ intense moisturizer, Skin barrier repair, Skin hydration, Transepidermal water loss, Tape stripping

INTRODUCTION

The skin acts as the body's primary physical and immunological barrier. It protects the body from external attacks, such as environmental insults, pathogens, and chemical irritants along with regulating TEWL and maintaining epidermal hydration and overall skin homeostasis.[1] The stratum corneum, the outermost layer

of the epidermis, is the principal determinant of this barrier function. Disruption of the stratum corneum due to environmental exposure, aging, frequent cleansing, or dermatological disorders impairs barrier integrity, leading to increased TEWL, reduced water-holding capacity, depletion of intercellular lipids, and the clinical manifestations of dry, rough, scaly, and irritated skin. Consequently, restoration of epidermal barrier function is a primary therapeutic objective in the management of dry to very dry skin.[2]

Xerosis refers to dry skin, which is common clinical condition associated with impairment in epidermis and disruption of the lipid lamellae and natural moisturizing factor (NMF). It is common in patients suffering from chronic inflammatory skin conditions like atopic dermatitis and psoriasis, but it may develop due to environmental factors including cold weather, low humidity, and frequent cleansing. Xerosis often causes discomfort, pruritus, and reduced quality of life.[3] Ceramides include a series of at least seven sub-fractions, and collectively make up about 50% of the SC lipid mass and are crucial for maintaining barrier integrity, regulation of water retention, and protection of the skin from any irritants. Low level of ceramides has been linked with poor functioning of barrier and several skin disorders, including xerosis, atopic dermatitis, and psoriasis. Application of moisturizers containing ceramide on the skin has proven effective in restoration of the lipid matrix and lowering of TEWL.[2] Tape stripping is an established method to induce disruption of the stratum corneum and enable the evaluation of barrier repair by topical applied formulations through objective measures. The repair of skin barrier integrity can be assessed by a range of non-invasive biophysical methods such as skin moisture, TEWL, skin surface topography, and sebum levels, among other parameters.[4,5]

MemBio™ Intense Moisturizer is a ceramide-based moisturizer formulated with ceramides, niacinamide, panthenol, biotin, and salicylic acid. Ceramides replenish the intercellular lipid matrix, improve skin hydration, restore epidermal barrier integrity and reduce TEWL.[6] In addition, niacinamide promotes endogenous ceramide synthesis and enhances barrier function, panthenol acts as a humectant that supports hydration and epidermal repair, biotin contributes to healthy skin metabolism, and salicylic acid facilitates gentle desquamation to improve skin texture and reduce scaliness. Collectively, these ingredients are expected to provide rapid and sustained hydration while restoring skin barrier homeostasis.[7,8] The topical application of moisturizer is also supported by prior dermatological safety research. A 24-hour occlusive Primary Irritation Patch Test using healthy adults, based on the IS 4011:2018 cosmetic safety standard and Draize scoring method, has demonstrated that the formulation is non-irritant and safe on skin. Skin assessments conducted 24 hours after patch removal showed no adverse reactions across different skin types, supporting its suitability for further clinical evaluation. The present open-label clinical study was conducted to evaluate the safety, tolerability, and effectiveness of moisturizer in dry to very dry skin participants.

Primary objective includes skin hydration, skin barrier function and repair skin barrier damage. Secondary objective includes change in skin texture such as skin scaliness, skin roughness, skin redness, skin itchiness, skin dryness, skin smoothness and wrinkles.

METHODS

Study design

The study was conducted in accordance with the principles of the Declaration of Helsinki, the International Council for Harmonisation Guideline for Good Clinical Practice E6(R3), the Indian Council of Medical Research ethical guidelines (ICMR), and the New Drugs and Clinical Trials Rules, 2019. The study protocol was approved by ACEAS independent ethics committee on 21 Mar 2026 prior to the commencement of the study procedures (Approval Number: NB260006-ZL). The study was registered with the Clinical Trial Registry of India (CTRI) under registration# CTRI/2026/04/107400 before initiation of screening of the participants in the study. All participants provided written informed consent prior to enrolment.

This was a prospective, interventional, single-blind, safety, moisture-kinetic efficacy and in-use tolerability study of moisturizer cream in healthy adult participants with dry to very dry skin. A total of 26 participants were enrolled, with 25 completed the study. Study was conducted at Clinical Trials Department of NovoBliss Research Private Limited, Ahmedabad, India.

On day 01, baseline assessments were performed on the forearm and face before product application. A 2×2 cm area on the forearm was then subjected to barrier disruption using 24 consecutive applications and removals of transparent adhesive tape (3M) (Figure 1). Skin hydration, TEWL, skin texture using instrument and visual and tactile assessments by dermatologist trained evaluator at the forearm were evaluated both before and immediately after tape stripping.

Following barrier disruption, the test product was applied to two designated tape-stripped areas (test sites), while the remaining two tape-stripped areas were treated as control sites. The moisturizer was also applied to the face (right cheek) until fully absorbed. Moisture-kinetic assessments of the forearm and right cheek were performed at 20 minutes and 24 hours after the single application. Participants thereafter applied the moisturizer twice daily for 15 days, with follow-up evaluations on day 07 and day 15.

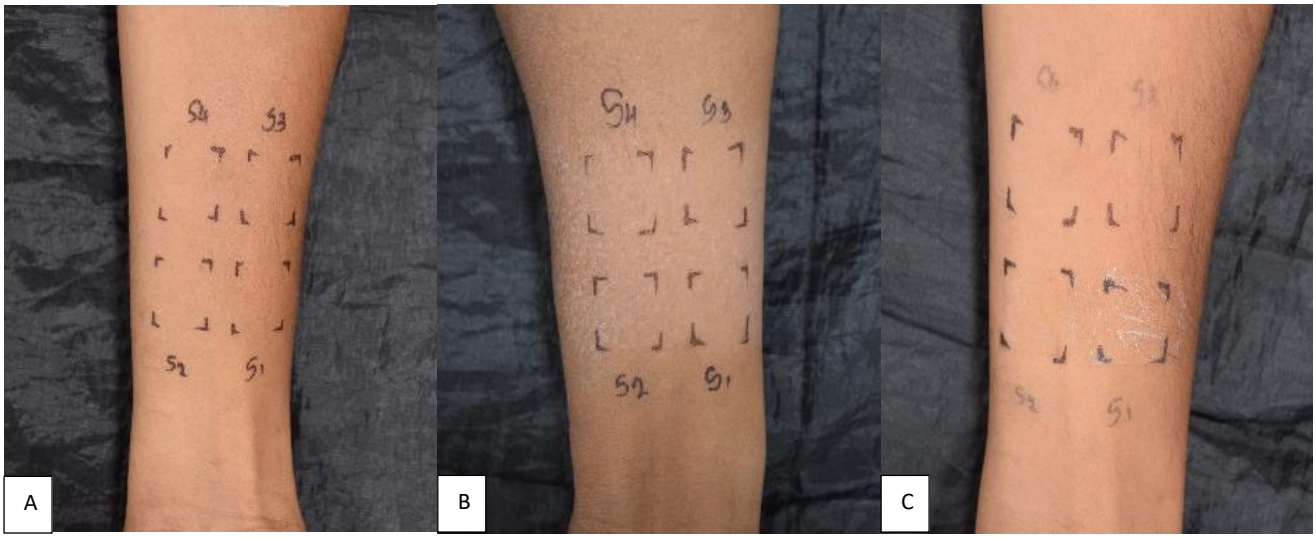


Figure 1 (A-C): Tape stripping. A-Visit 01 (Day 01), B-Visit 01 (Day 01) after tape stripping and C-Visit 01 (Day 01) After test product application.

Eligibility criteria

Participants were aged between 18 and 55 years (both inclusive) at the time of consent and included healthy males and non-pregnant, non-lactating females with dry to very dry skin, Female participants of childbearing potential practiced and agreed to maintain an established method of birth control and reported a negative urine pregnancy test at time of screening, while females were considered non-childbearing potential if they were surgically sterile, post-menopausal for at least one year, or had undergone tubal ligation.

All participants were willing to provide written informed consent, comply with regular follow-up visits, and record each use of the test product in the daily subject diary card.

Participants were excluded from the study if they have presence of other dermatologic diseases whose condition or product could interfere with study assessments; known allergy or sensitivity to any topical product; presence of any skin conditions or use of any medication, in the opinion of the investigator, could interfere with study results or pose undue risk to the participant.

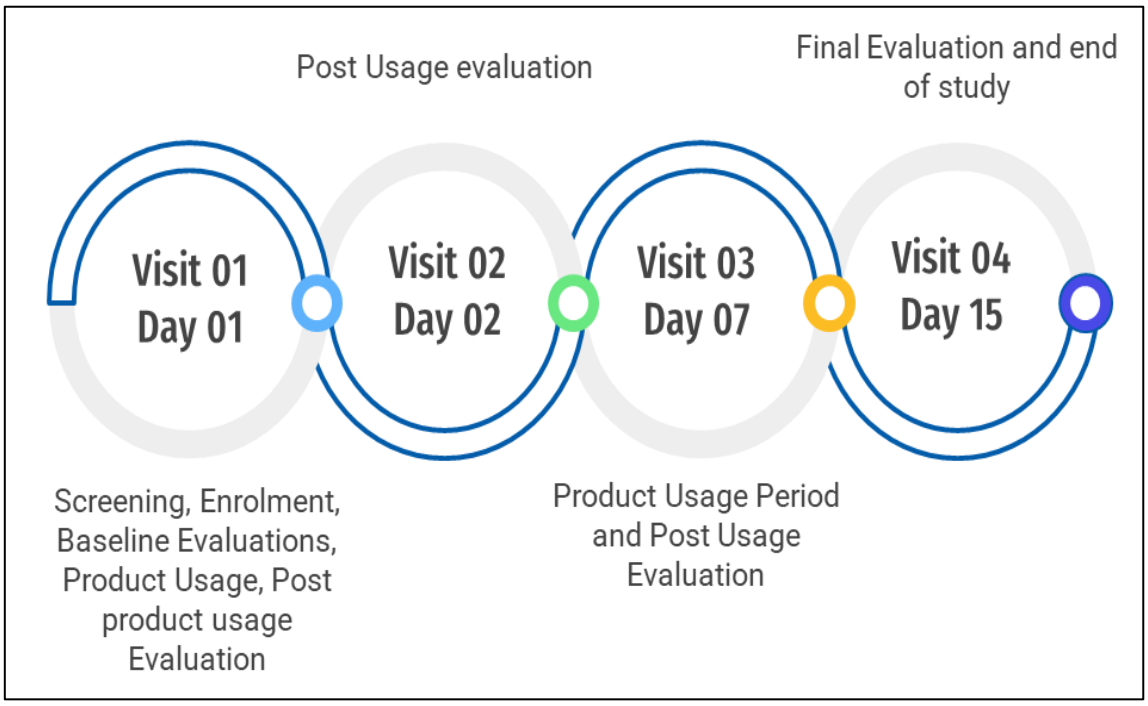


Figure 2: Study visits and assessments.

Test product details

MemBio™ Intense Moisturizer was manufactured and marketed by Zydus Healthcare Limited. It is a topical moisturizer that has ceramides, biotin, salicylic acid, niacinamide and d-panthenol as the main active ingredients. Participants were instructed to spread the moisturizer evenly on the designated areas of the face and forearm using gentle circular motions without excessive massage and to let the product be completely absorbed. Following the initial application, no additional product was applied for the subsequent 24 hours to facilitate moisture-kinetic assessments.

Thereafter, participants applied the moisturizer twice daily until day 15. The product was stored below 30 °C, as recommended by the manufacturer.

Primary evaluations

Skin hydration was measured using a Corneometer® CM 825 (Courage + Khazaka Electronic GmbH, Cologne, Germany). The instrument quantifies the hydration of the stratum corneum by measuring its dielectric capacitance, with higher capacitance values indicating greater skin hydration. Skin hydration was measured in arbitrary units (a.u.).

Skin hydration of the right cheek was measured at baseline, 20 minutes after the initial product application (T20 min), 24 hours after the single application (day 02), day 07, and day 15.

Skin hydration of the forearm was measured at baseline, immediately before and after tape stripping, 20 minutes after the initial product application (T20 min), day 2, day 07 and day 15. Measurements were obtained from both test and control tape-stripped sites to evaluate skin barrier repair.

TEWL was measured using a Tewameter® TM Hex (Courage + Khazaka Electronic GmbH, Cologne, Germany). The instrument determines the water vapor flux density (g/m²/h) from the skin surface using multiple temperature and humidity sensors, providing a non-invasive assessment of skin barrier function.

TEWL of the right cheek was measured at baseline, 20 minutes after the initial product application (T20 min), day 02, day 07, and day 15.

TEWL of the forearm was measured at baseline, immediately before and after tape stripping, 20 minutes after the initial product application (T20 min), day 02, day 07 and day 15.

Measurements were obtained from both test and control tape-stripped sites to evaluate skin barrier function and barrier repair.

Secondary evaluations

Skin surface evaluation was assessed using the VISIOSCAN® VC 20 Plus (Courage + Khazaka Electronic GmbH, Cologne, Germany), a high-resolution UVA-light video imaging system. The instrument evaluates skin surface morphology, including smoothness, roughness, scaliness and wrinkles in arbitrary units (Figure 9).

Skin surface characteristics of the right cheek were assessed at baseline, 20 minutes after the initial product application (T20 min), day 2, day 07, and day 15.

Skin surface characteristics of the forearm were assessed at baseline, immediately before and after tape stripping, 20 minutes after the initial product application (T20 min), day 02 day 07 and day 15. Measurements were obtained from both the test and control tape-stripped sites.

Skin Sebum level was measured using a Sebumeter® SM 825 (Courage + Khazaka Electronic GmbH, Cologne, Germany). The instrument quantifies surface sebum based on the grease-spot photometric principle, in which changes in the transparency of a specialized tape are proportional to the amount of sebum present on the skin surface. Skin sebum level was measured in µg/cm².

Skin sebum level of the right cheek was measured at baseline, 20 minutes after the initial product application (T20 min), day 02, day 07, and day 15.

Skin gloss was measured using a Glossymeter GL 200 (Courage + Khazaka Electronic GmbH, Cologne, Germany). The instrument quantifies skin gloss based on the principle of light reflection by measuring both specular and diffuse reflected light from the skin surface. Skin gloss was measured in Gloss unit (GU).

Skin gloss of the right cheek was measured at baseline, 20 minutes after the initial product application (T20 min), day 02, day 07, and day 15.

Desquamation index was measured by using Corneofix® F 20 tape-sampling foil analyzed in combination with the Visioscan® VC 20plus. Desquamation index was measured in a.u.

Desquamation index of the right cheek was measured at baseline, 20 minutes after the initial product application (T20 min), day 02, day 07, and day 15.

Participants completed a structured questionnaire evaluating perceived skin hydration, smoothness, dryness, and roughness.

Digital facial images were captured using the VisioFace® RD (Courage + Khazaka Electronic GmbH, Cologne, Germany), a high-resolution digital imaging system with controlled LED illumination (Figure 3).

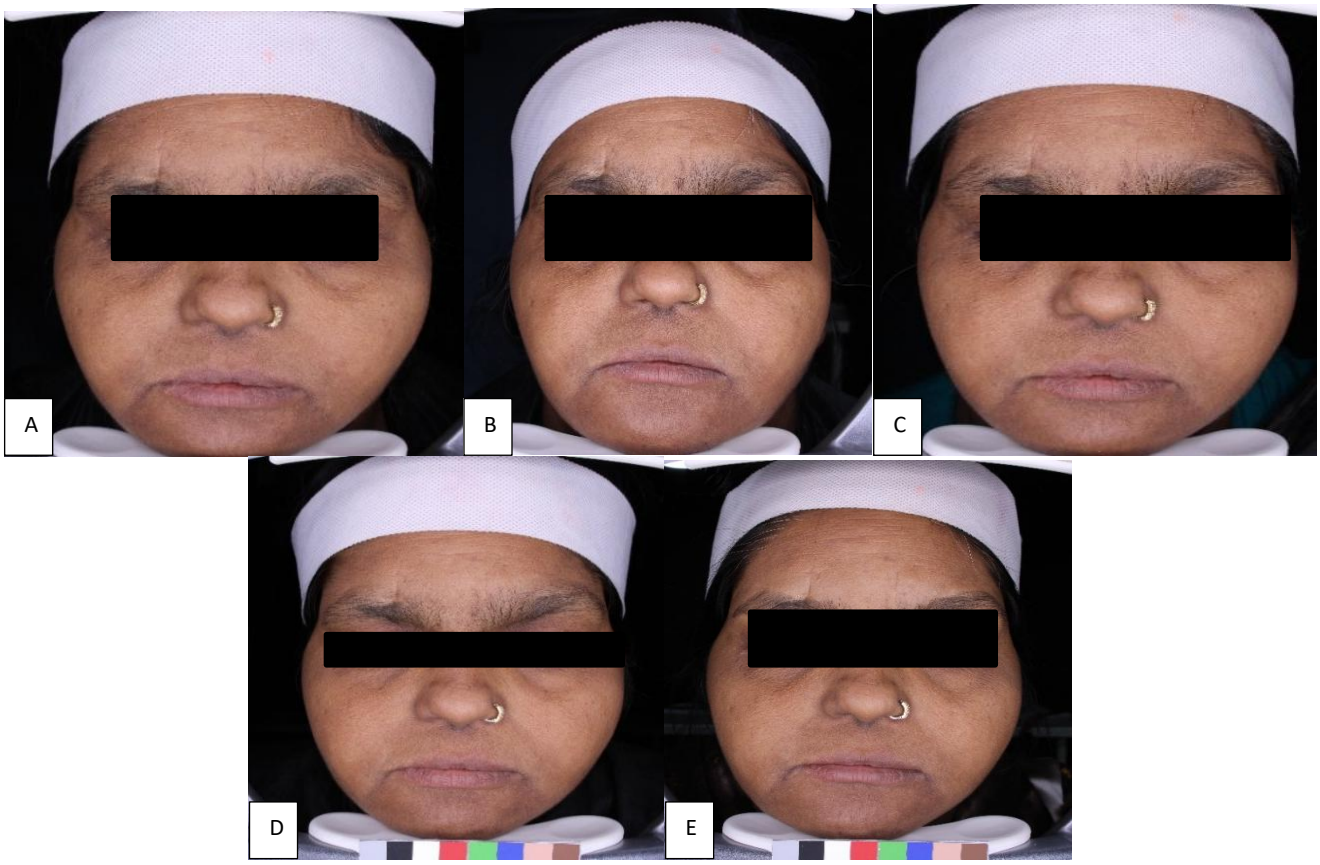


Figure 3 (A-E): Digital facial images. A-Visit 01 day 01 (Baseline), B-Visit 01 day 01 (T20min), C-Visit 02 day 02, D-Visit 03 day 07 and E-Visit 04 day 15.

Statistical analysis

All data were reviewed prior to analysis to ensure accuracy and completeness. Records with missing data were excluded. Descriptive statistics (N, Mean, SD, Median, Minimum and Maximum) were used to summarize continuous variables. Categorical variables were presented as frequencies and percentages, accompanied by graphical representations when necessary. For comparing continuous variables from baseline to post-treatment, a paired t test was employed. Ordinal variables were analysed using the Wilcoxon signed-rank test for baseline to post-treatment comparisons. Adverse events (AEs) were summarized in terms of frequency and percentage. Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 29.0.1.0 (2023; IBM Corp., Armonk, NY, USA) and Microsoft excel 2019 (Microsoft Corp., Redmond, WA, USA). A 5% significance level was applied.

Sample size

A total of 26 participants including both males and non-pregnant, non-lactating females, aged 18-55 years (both inclusive) with dry to very dry skin was enrolled in the study and 25 participants completed the study.

RESULTS

Subject demographics and baseline characteristics

Total of 26 participants were enrolled, and 25 completed last study visit. Data analysis was performed on the 25 participants who completed last visit, including 16 females and 9 males (Table 1 and Figure 4).

Table 1: Demographical details, (n=25).

Variables	Statistics	N
Gender	Male	9 (36.00%)
	Female	16 (64.00%)
Age (in years)	Mean (SD)	35.04 (8.14)
Weight (in kg)	Mean (SD)	65.23 (17.34)
Height (in cm)	Mean (SD)	159.90 (9.70)

Primary outcomes

Skin hydration

Right cheek (dry to very dry skin)

Significant improvement in skin hydration was observed at all measured timepoints following application of the test product. Mean skin hydration increased from

25.44±5.38 at baseline to 51.69±4.77 at 20 minutes following a single application of the test product, representing a 111.01% improvement ($p<0.0001$). Hydration levels remained significantly higher than baseline at day 2 (44.75±4.34; 82.16% increase), day 7 (49.77±4.61; 106.24% increase), and day 15 (55.93±4.89; 129.25% increase) (all $p<0.0001$), indicating sustained and progressive enhancement of skin hydration over the study period (Figure 6).

Tape-stripped forearm

Tape stripping successfully reduced skin hydration at both the test and control sites, confirming effective barrier disruption.

Application of the test moisturizer produced an immediate and sustained improvement in skin hydration, with the treated site demonstrating significantly higher hydration than the untreated control site throughout the study period, showing increases of 841.73% at 20 minutes, 582.28% on day 2, 612.74% on day 7, and 599.05% on day 15 (all $p<0.0001$).

Skin barrier function

Right cheek

Baseline mean TEWL was 13.00±1.20, which decreased significantly to 10.75±1.27 at 20 minutes post-application, representing the 17.40% reduction ($p<0.0001$).

TEWL remained significantly lower than baseline at day 2 (12.16±1.66; 6.44% reduction; $p<0.01$), day 7 (10.52±1.21; 18.61% reduction; $p<0.0001$), and day 15 (9.83±1.15; 23.87% reduction; $p<0.0001$), indicating progressive improvement in skin barrier function over the study period (Figure 7).

Tape-stripped forearm

Tape stripping successfully increased TEWL at both the test and control sites, confirming skin barrier disruption. Compared with the control site, the test site demonstrated lower TEWL by 149.65% at 20 minutes, 92.35% on day 02, 145.48% on day 07, and 159.04% on day 15; the differences were statistically significant at 20 minutes, day 07, and day 15 ($p<0.0001$).

Following application of the test product, the treated site showed a rapid and sustained reduction in TEWL, while the untreated control site exhibited a progressive increase, indicating persistent barrier impairment.

Secondary outcomes

Skin surface evaluation including skin smoothness, roughness, scaliness and wrinkles were assessed using the VISIOSCAN® VC 20 Plus instrument.

Skin smoothness

Right cheek

Lower values indicate greater skin smoothness and improved skin texture. Mean skin smoothness decreased from 458.83±93.76 a.u. at baseline to 400.29±79.38 a.u. at 20 minutes post-application, representing a 12.33% improvement ($p<0.0001$). Improvements were also observed at day 02 (437.79±62.21 a.u.; 1.96% improvement; $p>0.05$), day 07 (414.01±52.50 a.u.; 7.16% improvement; $p<0.01$), and day 15 (381.33±47.02 a.u.; 14.00% improvement; $p<0.0001$) compared with baseline, indicating a progressive enhancement in skin smoothness with continued product use.

Tape-stripped forearm

Tape stripping impaired skin smoothness at both sites. Compared with the control site, skin smoothness was comparable immediately after tape stripping (4.56% difference; $p>0.05$); however, after product application, the treated site demonstrated significantly greater improvement, with enhancements of 169.67% at 20 minutes, 119.43% on day 02, 169.63% on day 07, and 193.44% on day 15 (all $p<0.0001$). Following application of the test moisturizer, the treated site showed an immediate and progressive improvement in skin smoothness throughout the study, whereas the untreated control site exhibited continued deterioration.

Skin roughness

Right cheek

Higher values indicate lower skin roughness and improved skin texture. Mean skin roughness increased from 1.23±0.42 a.u. at baseline to 1.74±0.45 a.u. at 20 minutes post-application, representing a 64.77% improvement ($p<0.0001$). Improvements were also observed at day 02 (1.28±0.37 a.u.; 24.94% improvement; $p>0.05$), day 07 (1.58±0.40 a.u.; 52.83% improvement; $p<0.01$), and day 15 (1.98±0.46 a.u.; 105.28% improvement; $p<0.0001$) compared with baseline, indicating progressive enhancement in skin texture with continued use of the test product.

Tape-stripped forearm

Tape stripping increased skin roughness at both sites, indicating impaired skin texture. Compared with the control site, the treated site showed significantly greater improvement, with reductions in skin roughness of 181.38% at 20 minutes, 72.97% on day 02, 152.37% on day 07, and 215.05% on day 15 ($p<0.05$, <0.01, <0.0001, and <0.0001, respectively). Application of the test moisturizer produced an immediate and sustained improvement in skin roughness, despite a slight decline at day 02, whereas roughness progressively worsened at the untreated control site.

Skin scaliness

Right cheek

Mean skin scaliness decreased significantly from 4.78±1.78 a.u. at baseline to 3.54±1.30 a.u. at 20 minutes post-application, representing a 24.67% improvement ($p<0.0001$). Improvements were maintained at day 02 (4.12±1.45 a.u.; 10.96% improvement; $p<0.05$), day 07 (3.37±1.13 a.u.; 25.91% improvement; $p<0.0001$), and day 15 (2.92±1.10 a.u.; 34.89% improvement; $p<0.0001$), demonstrating progressive reduction in skin scaliness with continued use of the test product. Lower values indicate reduced skin scaliness and improved skin condition.

Tape-stripped forearm

Following application of the test moisturizer, the treated site showed an immediate reduction in scaliness, with further improvements observed by days 7 and 15 despite a transient decline in effect on day 02. In contrast, skin scaliness progressively worsened at the untreated control site throughout the study. Compared with the control site, the treated site demonstrated significantly lower skin scaliness, with improvements of 131.92% at 20 minutes, 94.12% on day 02, 146.41% on day 07, and 174.73% on day 15 (all $p<0.0001$).

Skin wrinkles

Right cheek

Lower values indicate reduced skin wrinkling and improved skin appearance. Mean wrinkle scores decreased from 61.13±10.17 a.u. at baseline to 53.42±9.02 a.u. at 20 minutes post-application, representing an 11.99% improvement ($p<0.0001$). Improvements were also observed at day 02 (58.44±10.09 a.u.; 3.56% improvement; $p>0.05$), day 07 (54.53±9.56 a.u.; 11.52% improvement; $p<0.001$), and day 15 (50.09±8.98 a.u.; 17.19% improvement; $p<0.0001$) compared with baseline, indicating progressive reduction in skin wrinkles with continued use of the test product.

Tape-stripped forearm

Following application of the test moisturizer, the treated site showed an immediate reduction in wrinkle scores, with significant improvements evident by days 7 and 15 despite minimal change on day 02. In contrast, wrinkle appearance progressively worsened at the untreated control site throughout the study. Compared with the control site, the treated site demonstrated significantly greater improvement in skin wrinkles, with reductions of 125.42% at 20 minutes, 86.05% on day 02, 120.46% on day 07, and 145.32% on day 15 (all $p<0.0001$), indicating superior improvement in skin appearance with continued product use. Overall, decreasing wrinkle scores demonstrated progressive improvement in skin appearance, confirming the superior efficacy of the test product versus the untreated control site.

Visual and tactile assessment

Skin dryness, smoothness, roughness, redness, itchiness, and scaliness were evaluated by a dermatologist trained evaluator using standardized visual inspection and tactile assessments.

Right cheek (dry to very dry skin)

No scaliness, redness and itchiness was observed on the right cheek throughout the study while skin dryness and roughness improved progressively over time and resolved completely by day 7 and day 15 respectively.

Tape-stripped forearm

The test product rapidly improved tape stripping-induced skin changes, achieving complete resolution of scaliness within 20 minutes, roughness by day 7, and redness by day 2, while providing immediate and sustained relief from dryness through day 15. Although tape stripping induced transient itchiness, no itchiness was observed at either site from day 2 onward. In contrast, mild scaliness, roughness, and dryness persisted at the untreated control site. Furthermore, skin smoothness improved progressively at the treated site, with most participants exhibiting smooth to very smooth skin by day 15, whereas the control site remained predominantly rough throughout the study.

Desquamation index

The test product was evaluated for its effect on skin desquamation of the right cheek, where lower desquamation index values indicate improvement. The mean desquamation index decreased significantly from 46.23±4.77 a.u. at baseline to 29.13±4.87 a.u. at 20 minutes post-application, representing a 36.15% reduction ($p<0.0001$). Significant reductions were maintained at day 02 (35.06±6.21 a.u.; 23.79% reduction), day 07 (30.93±6.04 a.u.; 32.64% reduction), and day 15 (26.02±4.98 a.u.; 43.29% reduction) compared with baseline (all $p<0.0001$), indicating progressive improvement in skin desquamation over the study period.

Sebum level

The mean sebum level increased significantly from 12.19±5.55 µg/cm² at baseline to 24.11±9.59 µg/cm² at 20 minutes post-application, representing a 113.35% increase ($p<0.0001$). Significant increases were also observed at day 02 (18.87±6.69 µg/cm²; 68.08% increase), day 07 (22.42±7.74 µg/cm²; 106.84% increase), and day 15 (27.04±8.02 µg/cm²; 157.10% increase) compared with baseline (all $p<0.0001$). The progressive increase in sebum levels suggests enhanced

restoration of skin surface lipids over the study period, while remaining within the range associated with dry skin, indicating physiological lipid replenishment without excessive sebum production.

Skin shine

Skin shine was assessed on the right cheek. The mean skin shine increased significantly from 4.13±0.74 GU at baseline to 6.16±1.57 GU at 20 minutes post-application, representing a 50.66% increase ($p<0.0001$). Significant improvements were maintained at day 02 (4.92±1.03 GU; 19.83% increase), day 07 (5.33±1.24 GU; 31.90% increase), and day 15 (5.77±0.81 GU; 42.29% increase) compared with baseline (all $p<0.0001$). These findings indicate a rapid and sustained enhancement in skin radiance over the 15-day study period (Figure 9 B).

Participant perception questionnaire

Participant assessment indicated a high level of participant satisfaction with the test product. By day 15, all participants reported improvements in skin hydration, instant hydration, reduction in skin dryness and roughness, enhanced skin barrier function, increased skin smoothness, absence of irritation, less skin oiliness, a fine and smooth product texture, rapid product absorption, overall satisfaction with the test product, and willingness to recommend it. Additionally, all participants reported even spreadability of the test product. Most of the participants also perceived the product fragrance to be mild and soothing.

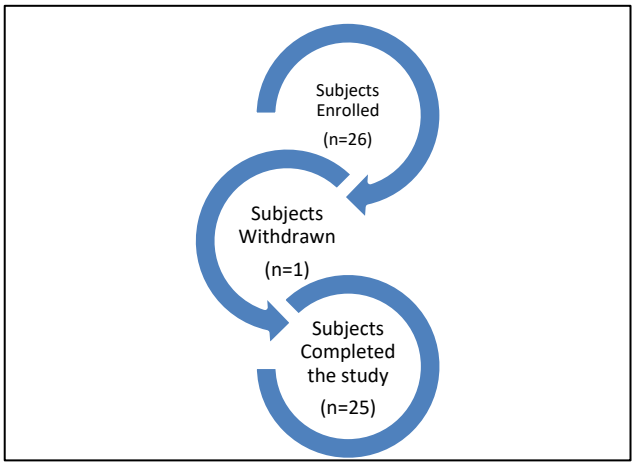


Figure 4: Demographic details.

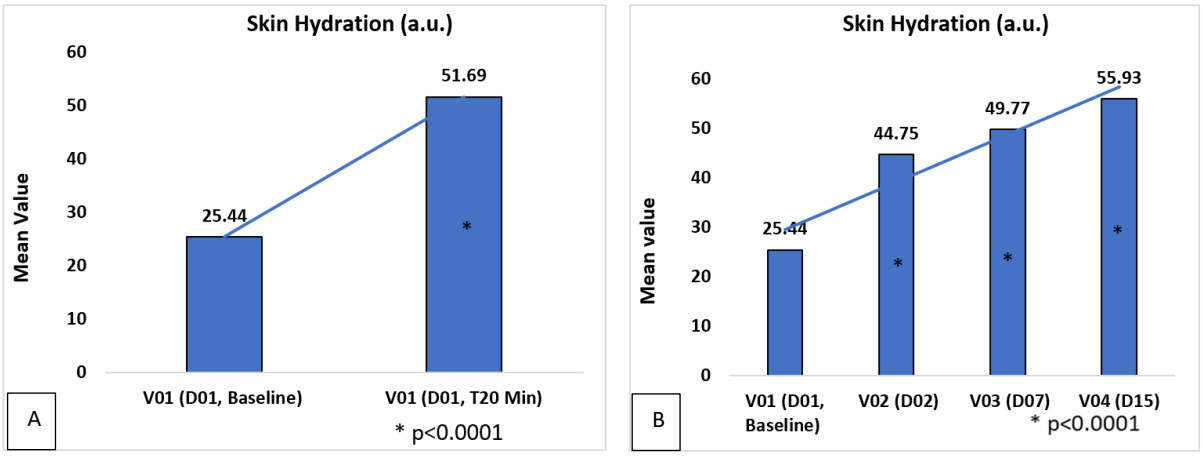


Figure 5: (A) Change in skin hydration at T20min and (B) change in skin hydration after continuous use.

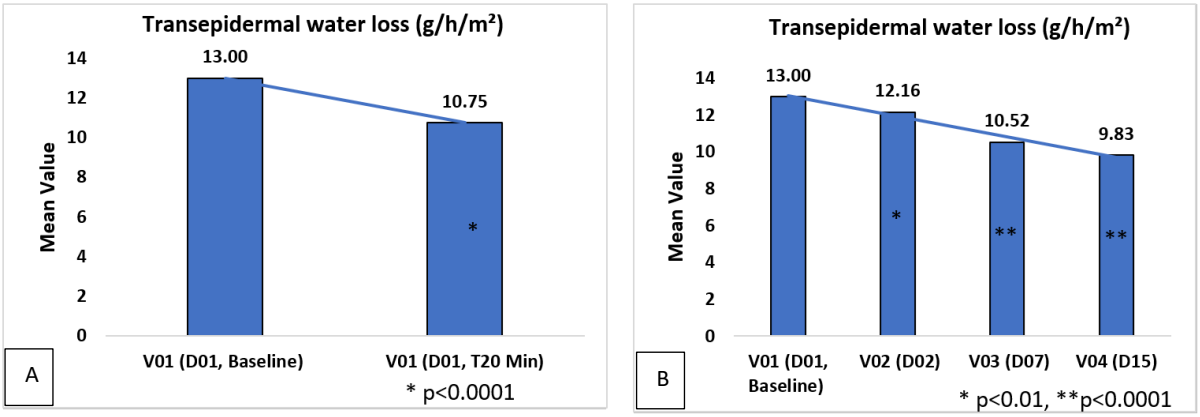


Figure 6: (A) Change in skin barrier function at T20 min and (B) change in skin barrier function after continuous use.

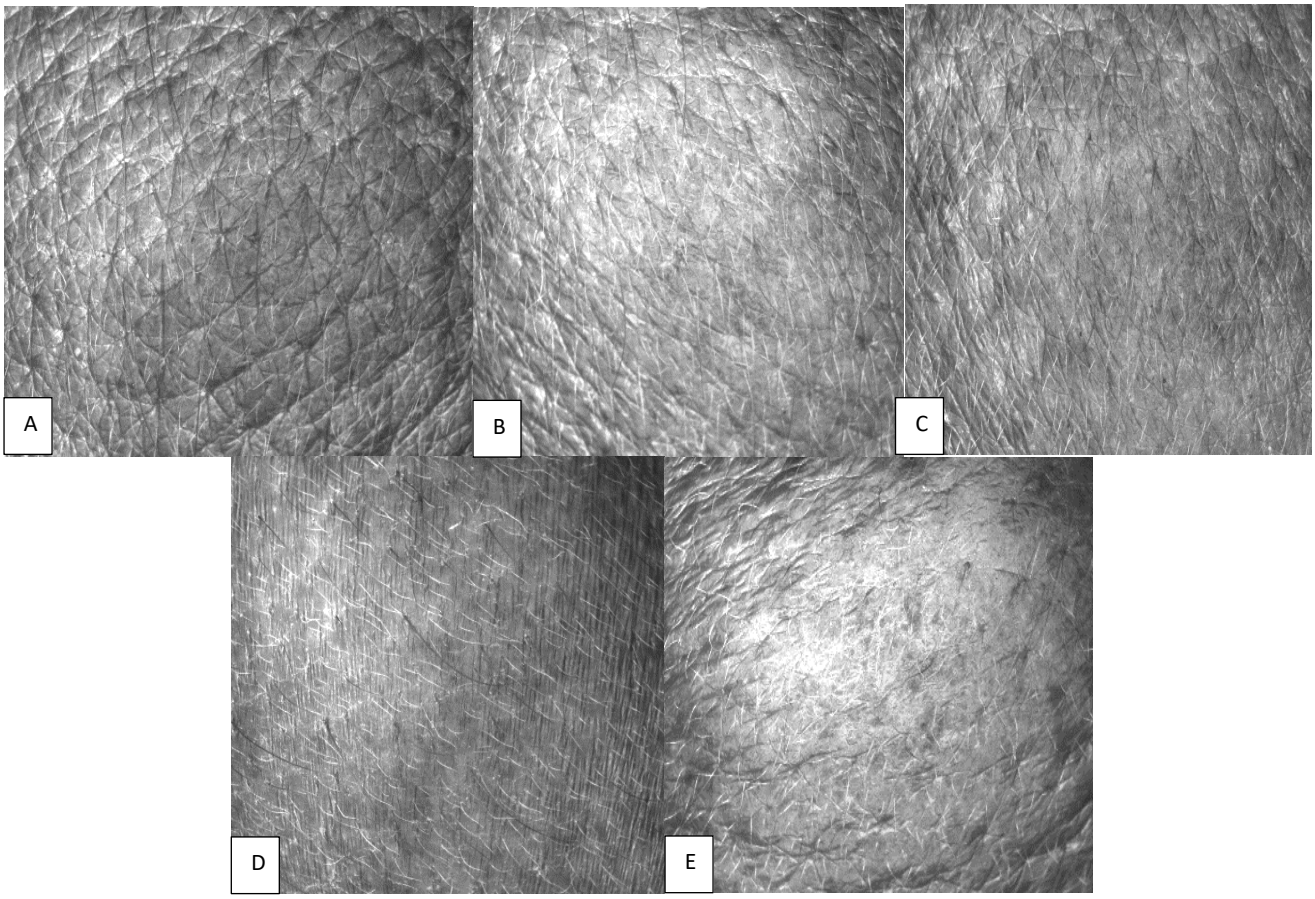


Figure 7: VISIOSCAN® VC 20 plus. (A) Visit 01 (Before application), (B) visit 01 (after application), (C) visit 02, (D) visit 03 and (E) visit 04.

*Representative VISIOSCAN® VC 20 Plus images of Subject #002 (right cheek) demonstrated progressive improvement in skin surface morphology following application of the test moisturizer. At baseline (Visit 01, before application), the skin exhibited prominent microrelief lines, uneven surface texture, and visible dry, scaly areas. Twenty minutes after product application, the skin surface appeared more hydrated with reduced surface roughness and less conspicuous scaling. At day 02, the improvement was maintained, with a smoother and more homogeneous skin surface. Continued twice-daily application further improved skin texture by day 07, showing a more uniform microrelief pattern and a noticeable reduction in scaliness. By day 15, the skin demonstrated the smoothest appearance, with minimal visible scaling, reduced surface irregularities.

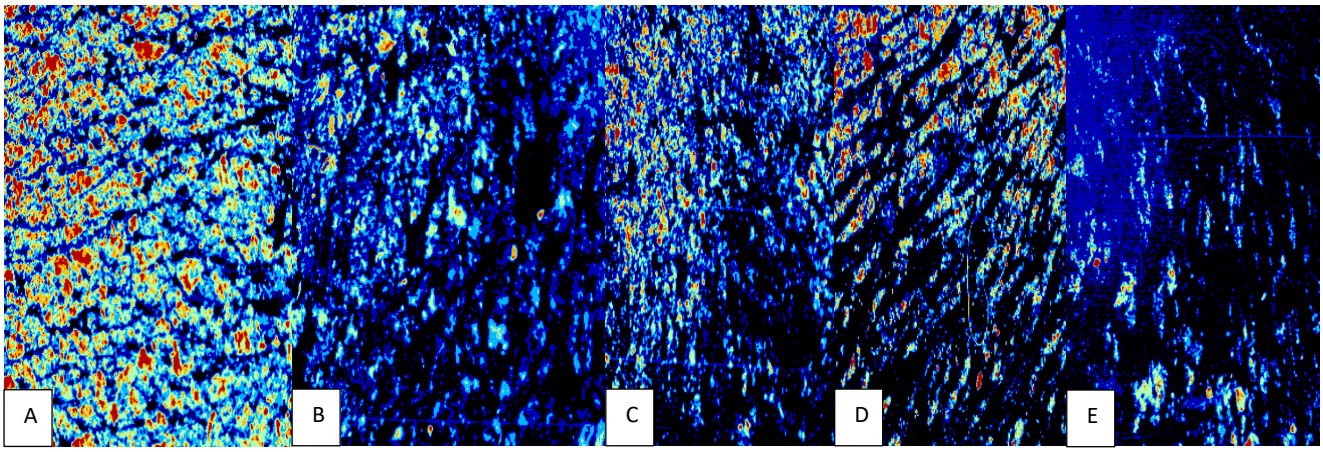


Figure 8: Desquamation index. (A) Visit 01 day 01 (Baseline) 52.12a.u., (B) visit 01 day 01 (T20 min) 22.63a.u., (C) visit 02 day 02 30.29a.u., (D) visit 03 day 07 20.77a.u and (E) visit 04 day 15 15.66a.u.

*The desquamation index decreased markedly from 52.12 a.u. at baseline to 22.63 a.u. at 20 minutes after product application, indicating an immediate reduction in skin desquamation. A slight increase was observed at day 02 (30.29 a.u.); however, the value remained substantially lower than baseline. Continued product use resulted in further reductions to 20.77 a.u. on day 07 and 15.66 a.u. on day 15, demonstrating progressive improvement in skin desquamation over the study period.

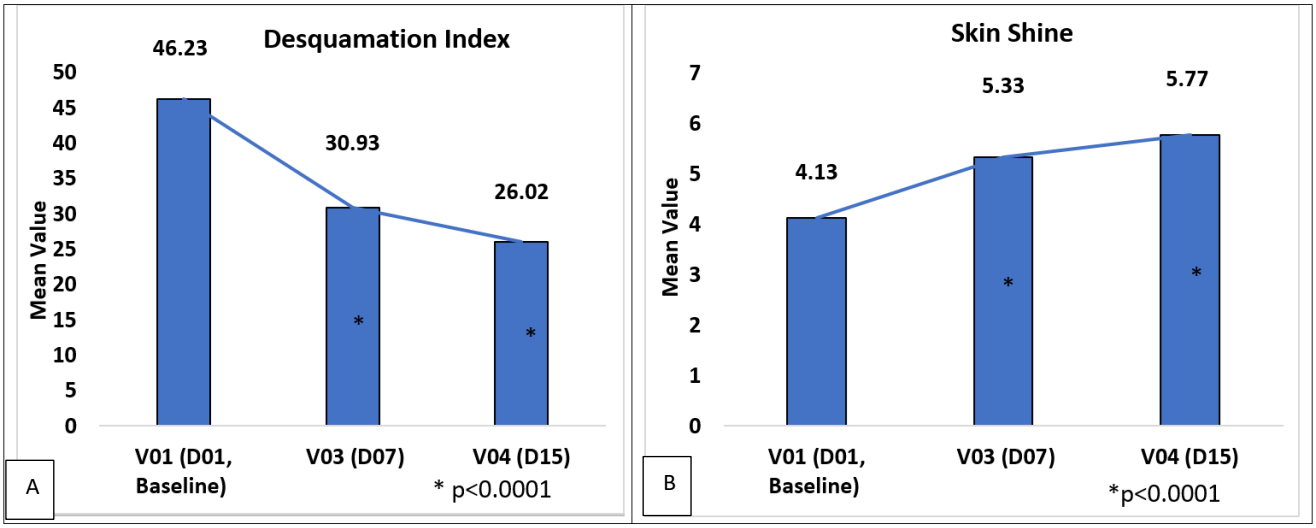


Figure 9: (A) Change in desquamation index and (B) change in skin shine.

DISCUSSION

Maintenance of adequate stratum corneum hydration is fundamental for preserving normal skin physiology and preventing xerosis-associated manifestations, including dryness, scaling, roughness, and increased susceptibility to environmental insults. Reduced water content within the stratum corneum impair skin barrier function, increases TEWL and compromises overall skin homeostasis.[9] Therefore, effective moisturizers should provide both immediate hydration and sustained improvement in skin moisture while supporting restoration of the epidermal barrier. Disruption of the stratum corneum by tape stripping provides a well-established experimental model for evaluating the efficacy of topical moisturizers in restoring barrier function.[10]

In the present study, MemBio™ Intense Moisturizer, a ceramide-based formulation, demonstrated rapid and sustained moisturizing efficacy in subjects with dry to very dry skin. Assessment of the right cheek revealed a significant increase in skin hydration within 20 minutes of application, which persisted for 24 hours and was further enhanced with continued twice-daily use over the 15-day study period. The sustained improvement in skin hydration was accompanied by a significant reduction in TEWL, indicating enhanced moisture retention and restoration of epidermal barrier function.

The barrier-restoring efficacy of MemBio™ Intense Moisturizer was further demonstrated using a tape-stripping model. Tape stripping successfully induced transient stratum corneum disruption, as evidenced by decreased skin hydration and increased TEWL at both test and control sites. Following application of the moisturizer, the treated site showed rapid and sustained recovery of skin hydration along with a significant reduction in TEWL throughout the study period, whereas the untreated control site exhibited persistently low hydration levels and elevated TEWL. These findings indicate that the moisturizer effectively accelerated barrier repair and restoration of skin moisture

Repeated application of the moisturizer resulted in progressive improvements in skin surface morphology. Skin texture assessments showed enhanced skin smoothness along with reduction in skin roughness, scaliness, and wrinkle appearance over the study period, whereas the control site showed progressive deterioration following barrier disruption. Additionally, gradual increases in skin surface lipid content remained within the physiological range, indicating restoration of the hydrolipid film without excessive sebum accumulation in dry to very dry skin.

The instrumental findings were further supported by participant-reported outcomes. The consistency between objective biophysical measurements and participant-reported outcomes enhances the clinical relevance of the finding; indicating that the formulation provides both measurable physiological improvements and noticeable improvement in skin appearance and feel. These effects are biologically plausible, as ceramides are key components of the stratum corneum lipid matrix and play a critical role in maintaining skin hydration, reducing TEWL, and preserving epidermal barrier integrity. Reduced ceramide levels in dry skin disrupt the lamellar lipid structure of the stratum corneum, leading to impaired barrier function and increased TEWL. Topical ceramide supplementation has been shown to restore stratum corneum lipid organization, promote barrier repair, enhance skin hydration, and reduce TEWL.[11] In addition, the formulation contains niacinamide, panthenol, biotin, and salicylic acid, which may further contribute to the observed clinical benefits. Niacinamide has been reported to stimulate endogenous ceramide synthesis and enhance barrier function, panthenol acts as a humectant that promotes hydration and supports epidermal repair, and biotin contributes to fatty acid and

protein metabolism essential for maintaining healthy skin.[7] Salicylic acid present in the formulation may have further contributed to the observed improvements in skin surface characteristics. Previous studies using tape-stripping models have demonstrated that topical salicylic acid enhances desquamation and facilitates removal of superficial corneocytes, resulting in reduced skin scaliness and improved skin texture.[8]

The study has limitations such as a short study duration and limited sample size. Nevertheless, to mention several strengths inclusive of a standardized tape-stripping model of barrier disruption, non-invasive assessment techniques, objective evaluation of multiple skin barrier parameters, and inclusion of participant-reported outcomes.

Our findings are consistent with previous studies demonstrating that ceramide-containing moisturizers improve skin hydration, reduce TEWL, enhance barrier function and improve skin texture. Synergistic interactions between Ceramide NP and Ceramide EOP have been reported to promote barrier repair and provide protection against experimentally induced barrier damage, supporting the improvements observed in the present study.[12,13] Furthermore, ceramide-based moisturizers have shown clinical benefits in barrier-impaired dermatological conditions, including xerosis, atopic dermatitis, and psoriasis, reinforcing their therapeutic value beyond routine cosmetic skincare.[14]

CONCLUSION

This open-label moisture-kinetic clinical study showed that MemBio™ Intense Moisturizer provides rapid and sustained improvement in skin hydration and epidermal barrier function in individuals with dry to very dry skin including tape-stripped skin. The moisturizer significantly reduced TEWL and improved skin characteristics i.e. smoothness, roughness, scaliness and wrinkle appearance. Furthermore, the skin surface lipid content indicated effective restoration of the stratum corneum and skin barrier. MemBio™ Intense Moisturizer found to be safe and well tolerated, with high participant satisfaction and no evidence of irritation. These findings support the use of MemBio™ Intense moisturizer as an effective daily moisturizer for restoring skin barrier function and managing dry to very dry skin.

ACKNOWLEDGEMENTS

The authors would like to thank to NovoBliss Research Private Limited for the services provided in conduct of clinical study, data analysis and medical writing.

Funding: Funding sources by Zydus Healthcare Limited
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee by ACEAS Independent Ethics Committee (Approval Number: NB260006-ZL).

REFERENCES

1. Trompette AUN. Skin barrier immunology from early life to adulthood. Mucosal Immunol. 2023;16(2):194-207.
2. Del Rosso JQ. Repair and maintenance of the epidermal barrier in patients diagnosed with atopic dermatitis: an evaluation of the components of a body wash-moisturizer skin care regimen directed at management of atopic skin. J Clin Aesthet Dermatol. 2011;4(6):45-55.
3. Proksch E, Lachapelle JM. The management of dry skin with topical emollients-recent perspectives. J Dtsch Dermatol Ges. 2005;3(10):768-74.
4. Patel NK, Merja A, Gajera D, Patel M. Assessing techniques for creating skin damage and evaluating wound healing: significance for skincare and clinical application. Int J Med Sci Innov Res. 2024;9(2):77-87.
5. Rowe D, Rowe M, Pontifex C, Stubbs D. Tape stripping method in dermatological and pharmacological research: evaluating fresh and frozen-thawed porcine skin. Cureus. 2024;16(9):e68477.
6. Yong TL, Zaman R, Rehman N, Tan CK. Ceramides and skin health: new insights. Exp Dermatol. 2025;34(2):e70042.
7. Bashir SJ, Dreher F, Chew A L, Zhai H, Levin C, Stern R, Maibach HI. Cutaneous bioassay of salicylic acid as a keratolytic. Int J Pharm 2005;292(1-2):187-94.
8. Kannan S, Balakrishnan J, Nagarajan P. Vitamin B7 (biotin) and its role in hair, skin and nail health. In: Hydrophilic Vitamins in Health and Disease. Cham: Springer. 2024;233-52.
9. Del Rosso JQ. Skin 101: understanding the fundamentals of skin barrier physiology-why is this important for clinicians? J Clin Aesthet Dermatol. 2025;18(2):7-15.
10. Bashir SJ, Chew AL, Anigbogu A, Dreher F, Maibach HI. Physical and physiological effects of stratum corneum tape stripping. Skin Res Technol. 2001;7(1):40-48.
11. Wang Y, Li S, Ai Y, Lynch S, Baalbaki N, Zhang X, et al. Evaluating the effect of moisturizers containing endogenous lipids on skin barrier properties. J Dermatol Sci Cosmet Technol. 2024;1:100037.
12. Huang HC. Ceramide 1 and ceramide 3 act synergistically on skin hydration and the transepidermal water loss of sodium lauryl sulfate-irritated skin. Int J Dermatol. 2008;47(8):812-19.
13. Spada F, Harrison IP, Barnes TM, Greive KA, Daniels D, Townley JP, et al. A daily regimen of a ceramide-dominant moisturizing cream and cleanser restores the skin permeability barrier in adults with moderate eczema: a randomized trial. Dermatol Ther. 2021;34(4):e14970.
14. Abbad-Jaime de Aragon C, Berna-Rico E, Prieto L, Abarquero-Cerezo M, Gonzalez-Cantero A. Improving the quality of life of patients with

inflammatory skin diseases: a multicenter evaluation of a ceramide-containing regimen in patients with atopic dermatitis, psoriasis and xerosis. J Dermatolog Treat. 2025;36(1):2486702.
15. Ceramide 3 vs ceramide AP: understanding the differences. Available from: Creative Proteomics. Available at: https://www.creative-proteomics.com/resource/ceramide-3-vs-ceramide-differences.htm. Accessed on 25 August 2026.
16. Ceramide EOP. Available from: Dr. Su. Available at: https://www.drsu.in/blogs/ingredients-listing/ceramide-eop. Accessed on 25 August 2026.
17. Harrison IP, Spada F. Breaking the Itch-Scratch Cycle: Topical Options for the Management of Chronic Cutaneous Itch in Atopic Dermatitis. Medicines (Basel). 2019;6(3):76.

Cite this article as: Vaishnav J, Zaveri D, Iyer SS, Patel N, Upadhyay V, Laddha R, et al. Efficacy and safety of MemBio™ intense moisturizer: barrier repair beyond hydration. Int J Res Dermatol 2026;12:568-79.