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A Moisturizer With *Centella asiatica* and Mandelic Acid Reduces Bruising and Speeds Recovery in Mature Skin

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ABSTRACT

Background: Dermatoporosis is a chronic cutaneous insufficiency syndrome characterized by skin atrophy, purpura, bruising, delayed healing, and increased injury susceptibility. This study evaluated an investigational cream, GC (Galderma Laboratories, L.P., Fort Worth, TX), in subjects with mature, crepey, bruise-prone skin, using a novel method to assess bruise severity and duration.

Methods: This 12-week multicenter, randomized, blinded, in-use study recruited men and women aged 40 to 60 years with fragile, bruise-prone skin to apply GC cream twice daily to knees and thighs. A subset of 15 subjects underwent electric cupping on 1 randomized upper knee at baseline and week 12 to induce localized ecchymosis. Bruise severity was evaluated 15 minutes postinduction by investigators using standardized photography, and subjects captured daily images until resolution. Safety, tolerability, and subject satisfaction were assessed throughout.

Results: After 12 weeks of GC cream use, investigator-assessed bruise severity score was significantly lower than baseline (mean [SD] 3.27 [1.33] vs 4.13 [1.02]; [*P*=.0087]). Days to bruise resolution were also numerically shorter at week 12 compared with baseline (mean [SE] 6.33 [0.91] vs 8.00 [0.56]; [log-rank *P*=.3134]). Serial photography confirmed expected temporal evolution and resolution of bruising and supported improvement in investigator-assessed severity. Subject satisfaction was high, and there were no related adverse events.

Conclusion: Twelve weeks of twice-daily GC cream use significantly reduced bruise severity induced by electric cupping and helped bruises resolve faster. These findings support GC cream as an important new option to reduce bruise potential and improve skin health of subjects with dermatoporosis.

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INTRODUCTION

Dermatoporosis is a cutaneous syndrome characterized by a progressive loss of skin strength and structural integrity.[1-4] Its clinical features include atrophy, purpura, lacerations, delayed healing, and, in advanced cases, dissecting hematomas.[1-4] Skin fragility may range from thinning, wrinkling, and laxity in midlife to marked atrophy with purpuric lesions in older individuals.[2,5,6] This spectrum reflects the varying contributions of intrinsic aging, photoaging, environmental exposure, and other factors that drive tissue decline.[5,6]

Visible bruising is a clinically relevant feature of dermatoporosis because it is readily apparent to subjects, can be distressing, and may indicate reduced tissue support.[7,8] In mature skin, dermal thinning, extracellular matrix deterioration, vascular fragility, and reduced subcutaneous support can lower the threshold for vessel rupture and ecchymosis.[7,8] Morphologic studies using reflectance confocal microscopy and ultrasonography have demonstrated structural changes in dermatoporosis, supporting the value of objective assessment of skin structure in this condition.[9]

The biology of bruise-prone mature skin is multifactorial. Intrinsic aging and chronic ultraviolet exposure alter epidermal function, collagen and elastin organization, dermal thickness, vascular support, and skin biomechanics.[10-13] Type I collagen loss contributes to dermal thinning and reduced tensile strength, while altered hyaluronan-CD44 signaling has been implicated in dermatoporosis-associated atrophy and purpura.[14-17] Cellular senescence provides another mechanistic framework for age-related skin fragility, as senescent fibroblasts and keratinocytes

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have been described in aging skin, and emerging evidence suggests that senescence-related processes, including impaired clearance of photoaged fibroblasts, may contribute to dermal matrix disruption.[18-22] Together, these changes reduce perivascular and dermal support, making small vessels more susceptible to rupture after minor mechanical stress and increasing the likelihood of visible bruising.[7,8]

Current management of mature, fragile, bruise-prone skin remains limited and is largely supportive. Recommended approaches generally include photoprotection, gentle cleansing, moisturization, avoidance of unnecessary topical corticosteroid exposure, and mechanical protection of vulnerable skin, such as wearing protective clothing or limb coverings, selecting clothing that camouflages bruises when desired, and adopting lifestyle modifications to reduce avoidable minor trauma.[7,8,23-26] Published interventions for dermatoporosis or actinic purpura include topical retinaldehyde with defined-size hyaluronate fragments, topical vitamin C, collagen-oriented strategies, device-based approaches, and newer skin-fragility formulations.[27-30] Across these published interventions, study populations, anatomic sites, comparators, and endpoints differ, and bruise-specific outcomes are not consistently reported.[27-30]

Previously, Widgerow explored the effects of microdosed *Centella asiatica* and mandelic acid. In vitro data showed a synergistic decrease in expression of genes related to the senescence-associated secretory phenotype and associated inflammation; an ex vivo skin model validated reduced senescent cells with the microdosed formulation.[31] This novel formulation is now the investigational product, GC cream (Galderma Laboratories, L.P., Fort Worth, TX), that is being assessed in a multicenter, randomized, blinded, in-use clinical study of adults with mature, crepey skin. Given the potential for GC cream to modify cell senescence and improve dermal structure, we assessed its efficacy, subject satisfaction, and safety on induced bruise severity and duration.

MATERIALS AND METHODS

This was a 12-week multicenter study conducted in the United States in accordance with Good Clinical Practice guidelines. Institutional Review Board (IRB) approval was obtained on July 30, 2025 (IRB ID: 14308; ClinicalTrials.gov number: NCT07398989). All subjects provided written informed consent.

Subjects

Eligible subjects were males and females aged 40 to 60 years with a self-reported history of fragile and easily bruised skin, mild-to-moderate skin crepiness, photodamage, and firmness on the knees and lower thighs, defined as a score of 3 to 6 on the modified Griffiths scale (0 = none; 9 = most severe).[32] Subjects agreed to discontinue current topical body skincare products and replace them with the study product for the duration of the study. For this bruising component, subjects were required to be willing to undergo bruise induction on the upper knees. Key exclusion criteria relevant to bruising included allergy or hypersensitivity to anesthetics or lidocaine; diagnosed bleeding disorder; history of excessive bleeding after medical procedures; current use of blood-thinning medications, immunosuppressive medications, or systemic steroids; and history of keloid formation or hypertrophic scarring.

Study Product

Subjects were instructed to apply the GC cream liberally twice daily, morning and evening, to the thighs and knees. Reapplication was encouraged throughout the day as needed. A supporting SPF moisturizer was provided, which subjects were instructed to use before sun exposure and to reapply as needed throughout the day. For at least 3 days before baseline, subjects used only their regular body cleansing product and avoided body moisturizers and other topical body skincare products. Subjects agreed to stop using current topical skincare products for the duration of the study.

Bruise Induction

Bruise induction was performed and assessed at 1 selected center in this multicenter study. Bruising was induced on the randomized upper knee using an electric cupper (Smart Cupping Therapy Massager, manufactured by Revomadic) on heat level 0, suction level 5 or higher, and cupping mode 2 (continuous suction). Optional lidocaine could be applied before cupping. The cupper was applied for a minimum of 10 minutes, and the induced bruise was required to reach at least moderate visibility at baseline, defined as a score of 3 or higher on the 5-point Bruise Visibility Scale.[33] If needed, cupping could continue in 2-minute intervals until target bruise visibility was reached. A specific cupping procedure was established for each subject at baseline, which was repeated at week 12 in order to standardize bruise induction and assessment.

Assessments

Clinical grading of bruise severity was performed at baseline and week 12 by the investigator based on a 5-point Bruise Visibility Scale. Standardized bruise photography was obtained 15 minutes after bruise induction using a handheld Canon EOS R100 camera with ranging lights (Canfield Scientific, Inc.). Images were captured under standard and cross-polarized filters. Subjects were also instructed to capture daily at-home images of the bruise, using similar positioning, timing, lighting, and location, when possible. Subjects submitted the images through a data-protected platform until the bruise was resolved or no longer visible. Bruising endpoints included change in bruise visibility/severity and change in bruise duration after 12 weeks of product use compared with baseline.

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Subjects' perception, satisfaction, and preference regarding the study product were appraised via a self-assessment questionnaire at weeks 4, 8, and 12. Tolerability of the GC cream was evaluated at baseline and weeks 4, 8, and 12. Investigators assessed erythema, edema, and dryness of subjects' knees and lower thighs using a 4-point analog scale (0 = none, 1 = mild, 2 = moderate, 3 = severe). Adverse events (AEs) were monitored throughout the study, including potential study product–related events and procedure-related events relevant to cupping.

Statistical Methods

Change from baseline in bruise visibility/severity and bruise duration was analyzed using a one-sample t-test; if normality assumptions were not met, the Wilcoxon signed-rank test was used. A decrease in bruise visibility/severity score indicated improvement, and a decrease in bruise duration indicated improvement in bruise resolution. Subjects with bruise resolution of more than 10 days were censored. For subject questionnaire data, a binomial sign test was applied to determine whether the proportion of combined favorable responses differed significantly from that of combined unfavorable responses. All statistical tests were performed at a two-sided significance level of 5%.

RESULTS

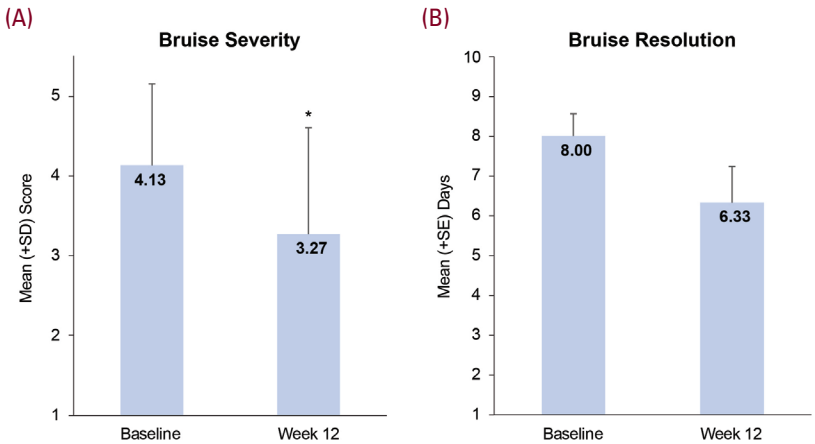
A total of 31 subjects were enrolled in the 12-week study across 2 centers; characteristics of the study population have been previously reported.[34] Baseline characteristics of the bruising cohort are summarized in Table 1. Sixteen (16) subjects were included at baseline, and 15 subjects had bruise assessments at week 12 and were evaluable for bruising-specific endpoints. Subjects in the bruising cohort were a mean of 54 years of age (range, 43–60 years), all identified as White/Caucasian, and 15 of 16 were female, non-Hispanic or Latin American, and had Fitzpatrick skin types II or III.

TABLE 1.

Subject Disposition and Baseline Characteristics. This cohort represents subjects who participated in the bruising assessments, including bruise induction, investigator-assessed bruise severity, standardized bruise photography, and daily at-home photographic follow-up until bruise resolution.

Subjects		N	%
Number	Enrolled	16	100
	Completed	15	93.8
Age	Mean	54	
	Minimum	43	
	Maximum	60	
Sex	Female	15	93.8
	Male	1	6.3
Race	White/Caucasian	16	46.7
Ethnicity	Hispanic/ Latin American	1	26.7
	Non-Hispanic/ Latin American	15	93.8
Fitzpatrick Skin Type	I	0	0
	II	10	62.5
	III	5	31.3
	IV	1	6.3
	V	0	0
	VI	0	0

FIGURE 1. Bruise severity and resolution time at baseline and week 12. Bruise severity was assessed by the investigator on a 5-point scale (1 = barely visible, 3 = moderately visible, 5 = clearly visible).



Data shown are the mean (SD) of n=16 at baseline and n=15 at week 12; *P<.05 vs baseline. Time to bruise resolution was documented by daily subject photography. Data shown are the mean (SE) of n=16 subjects at baseline and n=15 subjects at week 12.

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Mean (SD) investigator-assessed bruise severity decreased from 4.13 (1.02; n=16) at baseline to 3.27 (1.33; n=15) at week 12 (Figure 1A). The mean (SD) change from baseline was –0.87 (1.19; *P*=.0134). Bruise duration was assessed using daily subject-acquired photographs until bruise resolution or until the bruise was no longer visible. Documented bruise resolution in fewer than 10 days occurred in 12 of 16 subjects (75.0%) at baseline and in 13 of 15 (86.7%) at week 12. Mean (SE) time to resolution was 8.00 (0.56) days at baseline and 6.33 (0.91) days at week 12 (Figure 1B). Median time was 8.5 days and 7.0 days, respectively. The difference was not statistically significant (log-rank *P*=.3134). Resolution by day 7 was 31.3% at baseline versus 60.0% at week 12; by day 10, resolution was 75.0% versus 86.7%, respectively.

FIGURE 2. Representative clinical and subject photographs. (A) Subject 205 is a 54-year-old, non-Hispanic/Latin American, White/Caucasian female with Fitzpatrick skin type III. (B) Subject 213 is a 52-year-old, non-Hispanic/Latin American, White/Caucasian female with Fitzpatrick skin type II.

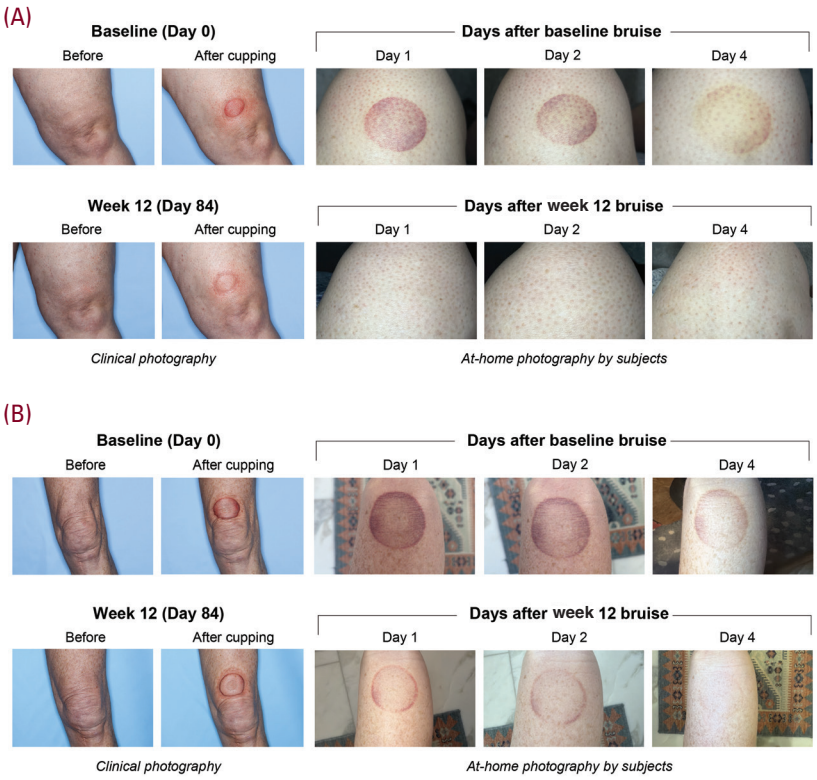
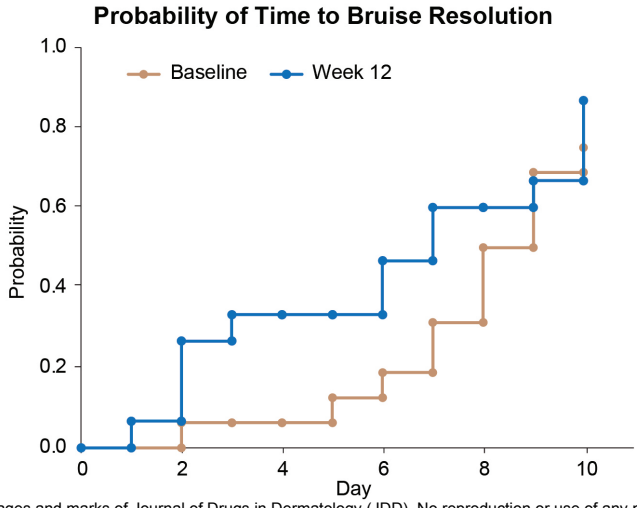


FIGURE 3. Cumulative probability of bruise resolution. Kaplan-Meier curves show the cumulative percentage of subjects with documented bruise resolution after bruise induction at baseline and week 12; censored subjects were included in the time-to-event analysis.



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FIGURE 4. Subject self-assessments after 4 weeks and 8 weeks of GC cream use. Study subjects completed questionnaires after 4 weeks (N=30) and 8 weeks (N=31). Data shown are the mean favorable responses.

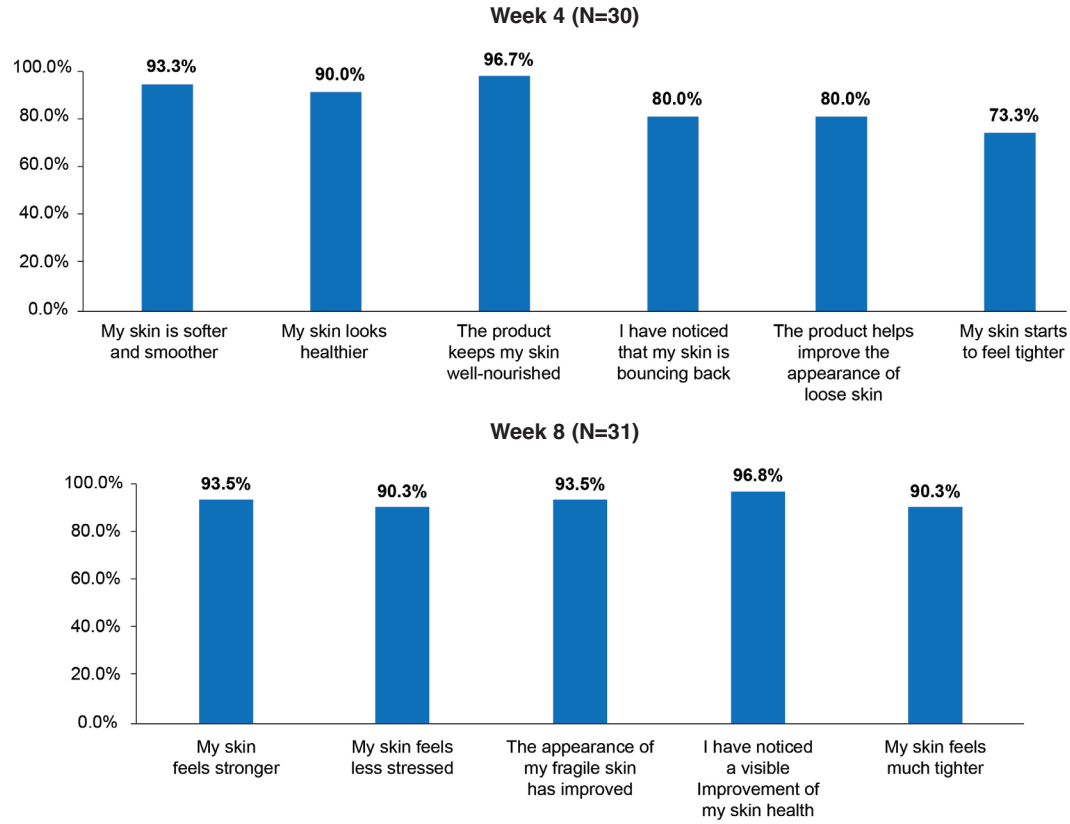


Figure 2 shows a representative series of daily at-home photographs from 2 subjects at baseline and week 12. The images show bruise evolution from early discoloration through fading and are consistent with mean severity and days to resolution shown in Figure 1.

Figure 3 shows the Kaplan-Meier plot of cumulative probability of bruise resolution over time. Half of the subjects documented resolution within 7 days or fewer after 12 weeks of GC cream use. At baseline, it took 8 days for bruising to resolve in half of subjects.

Clinical assessment of skin quality at baseline and week 12 for the full study population has been previously reported.[34] In the bruising subset, erythema and edema scores were 0.00 at baseline and at week 12. Mean (SD) dryness decreased from 0.56 (0.73) to 0.00 (0.00), with a mean change of –0.56 (0.73; *P*=.0074).

Subjects responded favorably to self-assessment questionnaires as early as 4 weeks of GC cream use and until the end of the study. Ninety percent (90.0%) of subjects reported that their skin looked healthier by week 4 and 93.5% reported that their skin felt stronger by week 8. After 12 weeks of use, consistent high satisfaction responses to questions about skin appearance ranged from 86.7% to 96.7%, while responses to questions about perceptions of skin health ranged from 90.0% to 93.3% (Figure 4). All subjects reported that they would continue using the GC cream (for responses to specific questions at week 12, see Ablon et al[34]).

No AEs related to the study product were observed or reported throughout the study. One subject was discontinued from the study because of a serious AE of equilibrium loss, which was not considered related to the study product.

DISCUSSION

Bruising is a common concern among adults with dermatoporosis. In mature skin, dermal matrix deterioration, diminished connective tissue support, and impaired barrier function may lower the threshold for bruising after minor trauma.[7,8,25,35] In addition to being distressing, visible bruising can reflect reduced dermal support and vascular protection. Currently, there are few evidence-based topical options available to address bruise severity or resolution.[7,27]

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This study shows that consistent twice-daily use of GC cream for 12 weeks helped lessen bruise severity and hasten bruise resolution in subjects with fragile, aging skin. Standardized clinical photography and daily subject-acquired photographs provided supportive visual documentation of bruise induction and longitudinal resolution, complementing the investigator-assessed severity and duration outcomes. Subjects were greatly satisfied with GC cream to improve overall skin appearance and restore skin health. There were no AEs related to the product, and subject satisfaction was high.

Traditionally, bruising studies have relied on invasive bruise induction methods, such as paintball pellets, dropped weights, and lasers, which can be difficult to standardize and reproduce.[36,37] Cupping with an electronic device was the bruise induction model chosen for this study due to the ability to carefully control the degree of suction and establish conditions for each subject that produced standardized bruising at baseline while maintaining the subject's safety. Cupping is an ancient procedure used in a variety of therapeutic settings. The application of controlled negative pressure disrupts tissues and capillaries, increases local blood flow, and creates an area of petechiae, purpura, or ecchymoses.[38] The resulting bruises are similar to those achieved from other invasive bruising methods. The use of subject-specific cupping conditions at baseline reduced intraindividual variation, and the use of the same subject-specific cupping conditions after 12 weeks of GC cream use helped reduce procedural variability. Daily subject-acquired photography supported longitudinal evaluation of bruise evolution. This is, to our knowledge, the first clinical study to use electric cupping to assess bruise severity and time to resolution. It offers an important new opportunity to expand evidence-based decision-making by dermatologists.

The rationale for evaluating a topical moisturizer in bruise-prone mature skin is biologically plausible. Moisturizers and barrier-supporting topical products may improve hydration and barrier integrity, while mature, fragile skin also reflects extracellular matrix deterioration and reduced tissue resilience.[25,39] Prior dermatoporosis research suggests that selected topical strategies may influence fragile skin biology, particularly through pathways related to hyaluronan signaling and dermal structure.[16,17,29] GC cream in particular was formulated based on ex vivo data showing that microdoses of *Centella asiatica* (0.005%) and mandelic acid (0.5%) reduced the number of senescent cells in the dermis and decreased inflammatory markers.[31] We have previously shown that this formulation improves skin hydration and increases expression of elastin and mechanical stretch with 12 weeks of use.[34,40] This is the first report of GC cream in a clinical study of bruising, and these results continue to support GC cream as a novel treatment for dermatoporosis.

A strength of this bruising-focused analysis is the integration of a standardized bruise induction method with both investigator assessment and longitudinal subject-acquired photography. The requirement that induced bruises reach at least moderate visibility supported interpretability of bruise visibility/severity and duration outcomes. The combination of in-clinic standardized imaging and daily at-home photography allowed evaluation of both immediate postinduction bruise appearance and subsequent bruise resolution.

Several limitations should be considered. First, the in-use study did not include a vehicle, untreated, or usual-care comparator arm; therefore, findings should be interpreted as within-subject changes after 12 weeks of GC cream use rather than controlled efficacy estimates. Next, the small number of subjects in the bruise cohort may limit generalizability to more diverse populations. Finally, bruises may differ by mechanism: everyday blunt-force trauma can involve pressure and shearing injury, whereas cupping produces tension-induced injury and rupture of small vessels. While the cupping model standardizes bruise induction and provides replicable control of the induction force, suction-induced bruises may not fully reproduce spontaneous bruising caused by everyday trauma. Despite these limitations, this study successfully deployed electric cupping as a standardized bruising method that could offer an alternative option for bruise models in future clinical settings.

CONCLUSION

Using a novel model of controlled bruise induction, this study provides important data to support evidence-based decision-making for subjects with dermatoporosis at risk of bruising. Reduced bruise severity and decreased time to bruise resolution are clinically relevant improvements in skin health. In combination with prior findings where GC cream was shown to improve hydration, overall appearance, and elasticity of mature, crepey skin,[34,40] the current data further support this topical cream as an innovative agent that can address multiple aspects of dermatoporosis, including bruising.

DISCLOSURES

Todd Schlesinger is an investigator and/or consultant for AbbVie, Almirall, Apogee, Arcutis Biotherapeutics, Benev, Biofrontera, Bristol Myers Squibb, Crown Aesthetics, Eli Lilly, Flint Clinical, Galderma, Genentech, Janssen, LEO Pharma, Oruka, Pfizer, Regeneron Pharmaceuticals, Sun Pharma, UCB, and Verrica; has served as an investigator for AbbVie, Allergan, Almirall, Arcutis Biotherapeutics, Aslan Pharmaceuticals, Biofrontera, Boehringer Ingelheim, Bristol Myers Squibb, Cara Therapeutics, Castle Biosciences, Concert Pharmaceuticals (acquired by Sun Pharma), Cutanea Life Sciences, Dermavant Sciences, Eli Lilly, Galderma, HighlightII, Incyte, IPSEN, Janssen, Medicus,

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REFERENCES

1. Dyer JM, Miller RA. Chronic skin fragility of aging: current concepts in the pathogenesis, recognition, and management of dermatoporosis. *J Clin Aesthet Dermatol.* 2018;11(1):13-18.
2. Kaya G, Kaya A, Sorg O, et al. Dermatoporosis: a further step to recognition. *J Eur Acad Dermatol Venereol.* 2018;32(2):189-191.
3. Kaya G, Saurat J-H. Dermatoporosis: a chronic cutaneous insufficiency/fragility syndrome. Clinicopathological features, mechanisms, prevention and potential treatments. *Dermatology.* 2007;215(4):284-294.
4. Wollina U, Lotti T, Vojvotic A, et al. Dermatoporosis - the chronic cutaneous fragility syndrome. *Open Access Maced J Med Sci.* 2019;7(18):3046-3049.
5. Ganceviciene R, Liakou AI, Theodoridis A, et al. Skin anti-aging strategies. *Dermatoendocrinol.* 2012;4(3):308-319.
6. Griffiths TW, Watson REB, Langton AK. Skin ageing and topical rejuvenation strategies. *Br J Dermatol.* 2023;189(Suppl 1):i17-i23.
7. Ceilley RI. Treatment of actinic purpura. *J Clin Aesthet Dermatol.* 2017;10(6):44-50.
8. Cho SI, Kim JW, Yeo G, et al. Senile purpura: clinical features and related factors. *Ann Dermatol.* 2019;31(4):472-475.
9. Menzinger S, Saurat J-H, Kaya G. Morphological analysis of dermatoporosis by in vivo reflectance confocal microscopy and ultrasonography. *Dermatopathology (Basel).* 2020;6(4):279-287.
10. Baumann L, Bernstein EF, Weiss AS, et al. Clinical relevance of elastin in the structure and function of skin. *Aesthet Surg J Open Forum.* 2021;3(3):ojab019.
11. Liang Y, Su W, Wang F. Skin ageing: a progressive, multi-factorial condition demanding an integrated, multilayer-targeted remedy. *Clin Cosmet Investig Dermatol.* 2023;16:1215-1229.
12. Rittie L, Fisher GJ. Natural and sun-induced aging of human skin. *Cold Spring Harb Perspect Med.* 2015;5(1):a015370.
13. Taylor CR, Stern RS, Leyden JJ, et al. Photoaging/photodamage and photoprotection. *J Am Acad Dermatol.* 1990;22(1):1-15.
14. Bar O, Valiukevičienė S. Skin aging and type I collagen: a systematic review of interventions with potential collagen-related effects. *Cosmetics.* 2025;12(4):129.
15. Bourguignon LY. Matrix hyaluronan-activated CD44 signaling promotes keratinocyte activities and improves abnormal epidermal functions. *Am J Pathol.* 2014;184(7):1912-1919.
16. Kaya G, Tran C, Sorg O, et al. Hyaluronate fragments reverse skin atrophy by a CD44-dependent mechanism. *PLoS Med.* 2006;3(12):e493.
17. Nikolic DS, Ziori C, Kostaki M, et al. Hyalurosome gene regulation and dose-dependent restoration of skin atrophy by retinaldehyde and defined-size hyaluronate fragments in dermatoporosis. *Dermatology.* 2014;229(2):110-115.
18. Dimri GP, Lee X, Basile G, et al. A biomarker that identifies senescent human cells in culture and in aging skin in vivo. *Proc Natl Acad Sci U S A.* 1995;92(20):9363-9367.
19. Dorf N, Maciejczyk M. Skin senescence—from basic research to clinical practice. *Front Med (Lausanne).* 2024;11:1484345.
20. Konstantinou E, Longange E, Kaya G. Mechanisms of senescence and anti-senescence strategies in the skin. *Biology (Basel).* 2024;13(9):647.
21. Xu X, Lu X, Chen X, et al. Elevated CD47 expression impairs elimination of photoaged fibroblasts by macrophages and serves as a potential biomarker for photoaging. *J Cosmet Dermatol.* 2025;24(4):e70098.
22. Zhang J, Yu H, Man MQ, et al. Aging in the dermis: fibroblast senescence and its significance. *Aging Cell.* 2024;23(2):e14054.
23. Cilluffo S, Bassola B, Beeckman D, et al. Risk of skin tears associated with nursing interventions: a systematic review. *J Tissue Viability.* 2023;32(1):120-129.
24. Gholizadeh S, Rice DB, Carboni-Jimenez A, et al. Effects of cosmetic and other camouflage interventions on appearance-related and psychological outcomes among adults with visible differences in appearance: a systematic review. *BMJ Open.* 2021;11(3):e046634.
25. Rajkumar J, Chandan N, Lio P, et al. The skin barrier and moisturization: function, disruption, and mechanisms of repair. *Skin Pharmacol Physiol.* 2023;36(4):174-185.
26. Syed HA, Masood S. Actinic purpura. In: *StatPearls [Internet].* Treasure Island, FL: StatPearls Publishing. 2026.
27. Guadanhim LRS, Miot HA, Soares JLM, et al. Efficacy and safety of topical or oral hydrolyzed collagen in women with dermatoporosis: a randomized, double-blind, factorial design study. *Dermatol Ther (Heidelb).* 2023;13(2):523-534.
28. Humbert P, Fanian F, Lihoreau T, et al. Bateman purpura (dermatoporosis): a localized scurvy treated by topical vitamin C - double-blind randomized placebo-controlled clinical trial. *J Eur Acad Dermatol Venereol.* 2018;32(2):323-328.
29. Kaya A, Saurat JH, Kaya G. Senotherapeutic effect of retinaldehyde and hyaluronate fragments in dermatoporosis. *Dermatopathology (Basel).* 2023;10(2):168-172.
30. Widgerow A, Grivet-Seyve M, Anjuwon S, et al. An innovative cream improves signs and symptoms of dermatoporosis in patients aged 65 and over. *J Drugs Dermatol.* 2025;24(4):352-356.
31. Widgerow AD, Ziegler M, Garruto JA, et al. Novel strategy for strengthening dermatoporotic skin by managing cellular senescence. *J Drugs Dermatol.* 2024;23(9):748-756.
32. Griffiths CE, Wang TS, Hamilton TA, et al. A photonumeric scale for the assessment of cutaneous photodamage. *Arch Dermatol.* 1992;128(3):347-351.
33. Scafide KN, Bahari G, Kutahyalioglu NS, et al. Development and pilot analysis of the Bruise Visibility Scale. *SAGE Open Nurs.* 2021;7:23779608211020931.
34. Ablon G, Emesiani C, Garimella S, et al. A novel moisturizer formulated with micronized *Centella asiatica* and mandelic acid improves mature, crepey skin. *J Drugs Dermatol.* 2026;9:833-838.
35. Bortolozo F, Rinaldi M, Souza P, et al. Dermatoporosis in upper limbs treated with polymethylmethacrylate microspheres using the BioSculpt® technique. *Cureus.* 2023;15(8):e43789.
36. Leu S, Havey J, White LE, et al. Accelerated resolution of laser-induced bruising with topical 20% arnica: a rater-blinded randomized controlled trial. *Br J Dermatol.* 2010;163(3):557-563.
37. Scafide KN, Sheridan DJ, Downing NR, et al. Detection of inflicted bruises by alternate light: results of a randomized controlled trial. *J Forensic Sci.* 2020;65(4):1191-1198.
38. Lowe DT. Cupping therapy: an analysis of the effects of suction on skin and the possible influence on human health. *Complement Ther Clin Pract.* 2017;29:162-168.
39. Lichterfeld-Kottner A, El Genedy M, Lahmann N, et al. Maintaining skin integrity in the aged: a systematic review. *Int J Nurs Stud.* 2020;103:103509.
40. Ablon G, Emesiani E, Garimella S, et al. Histological analysis shows a moisturizer formulated for dermatoporosis increases elastin content and improves skin elasticity. *J Drugs Dermatol.* 2026;25(10):962-966. doi:10.36849/JDD.10248

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