

**Efficacy of Ascorbic Acid, Alone or in Combination with Other Nutritional Supplements, for Senile Purpura: A Systematic Review**

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Conflicts of Interest: Nil

Abstract

Background: Senile purpura is common in elderly, attributed to degeneration of skin due to aging and sun exposure resulting in skin thinning and decreased collagen. Dermal ascorbic acid (vitamin C) content declines with aging, oral and topical ascorbic acid, alone or combined with bioflavonoids nutritional supplements have been evaluated as treatments.

Objective: To gather and analyze clinical evidence on the efficacy of ascorbic acid, alone or in combination with other nutritional supplements, for reducing the number, area, or severity of senile purpura lesions.

Methods: PubMed/MEDLINE-indexed records were searched using keywords: senile purpura, actinic purpura, solar purpura, Bateman purpura, dermatoporosis, ascorbic acid, vitamin C, bioflavonoid,

rutoside, nutritional supplement. Trials evaluating oral or topical ascorbic acid (alone or combined with another nutritional supplement) against placebo or an active compound, in participants with senile purpura, were eligible. Cochrane RoB 2 used for risk of bias. Because of small number of eligible trials, meta-analysis not done.

Results: Three controlled trials satisfied inclusion criteria (total n ≈ 103 randomised participants): a 1967 trial of oral ascorbic acid for purpura in elderly patients; a 2011 randomised, double-blind, placebo-controlled trial of an oral flavonoids with vitamin C in 67 patients with senile purpura, showing a 50% reduction in new lesions versus a 9% increase with placebo; and a 2018 randomised, double-blind, placebo-controlled, within-patient (hemi-limb) trial of topical 5% ascorbic acid in 18 patients with senile purpura, showing significant

reduction in haemorrhagic area and increased dermal thickness on the treated side. All three trials reported favourable effects. Indirect supportive evidence comes from four studies of oral rutoside plus ascorbic acid in pigmented purpuric dermatosis, consistently reported high rates of lesion clearance.

Conclusions: Preliminary evidence, small-to-moderate trials, suggests that both oral bioflavonoid–vitamin C combinations and topical ascorbic acid are effective against senile purpura.

Keywords: Dermal Ascorbic Acid, Dermatoporosis.

Introduction

Senile purpura (Synonyms: actinic purpura, solar purpura, or Bateman purpura) is a common, benign but disturbing dermatosis of elderly people, featuring ecchymoses on the skin, often with chronic photodamage and skin atrophy. Prevalence estimates range from roughly 10–12% of adults over 50 years. Senile purpura is now understood as one feature of dermatoporosis. Ageing and cumulative ultraviolet exposure reduce dermal collagen and elastin support around cutaneous vessels, so that minor shear forces rupture capillaries. Ascorbic acid is essential for prolyl

and lysyl hydroxylases in collagen synthesis, and dermal ascorbic acid content has been reported to fall with cutaneous ageing and photoexposure, a nutritional/biochemical hypothesis under which senile purpura represents, in part “localised scurvy”. Systemic ascorbic acid depletion in elderly population was documented in earlier nutritional surveys of older hospital and community populations. Bioflavonoids are frequently combined with ascorbic acid on the logic that they inhibit hyaluronidase, scavenge free radicals, and reduce capillary permeability, thereby complementing vitamin C’s role in vessel wall integrity.

On this basis, oral ascorbic acid, oral bioflavonoid–ascorbic acid combinations, and topical ascorbic acid have all been trialled as treatments for senile purpura

Rationale and objective

No systematic review specific to ascorbic acid (alone or combined with other nutritional supplements) for senile purpura was identified during this project’s searches. This review is aimed to systematically identify, appraise, and synthesise controlled clinical trial evidence answering the following question with the PICOS framework:

Element	Specification
Population	Adults with clinically diagnosed senile purpura.
Intervention	Ascorbic acid (oral or topical), alone or combined with another nutritional supplement like bioflavonoids
Comparator	Placebo, vehicle, no treatment, or active comparator
Outcomes	Count of purpuric lesions, haemorrhagic area, validated severity score, patient-reported outcome, dermal thickness, adverse events
Study design	Randomised or quasi-randomised controlled trials

Methods

Protocol and registration

This review was not registered in PROSPERO. It is reported in accordance with the PRISMA 2020 statement.

Eligibility criteria

Inclusion criteria: (1) Human participants with a clinical diagnosis of senile purpura (2) evaluated ascorbic acid, orally or topically, alone or in combination with another nutritional supplement as the intervention (3) used a randomised or quasi-randomised controlled design with a placebo, vehicle, no-treatment, or active comparator arm;

Exclusion criteria: Case reports, case series without a comparator, animal and in vitro studies, studies of unrelated purpura syndromes (e.g., immune thrombocytopenic purpura, Henoch–Schönlein purpura, drug-induced purpura) and studies restricted to pigmented purpuric dermatoses (Schamberg disease and related capillaritides) were excluded from the primary quantitative synthesis. Pigmented purpuric dermatosis trials were, however, retained for narrative discussion as related indirect evidence.

Information sources and search strategy

PubMed/MEDLINE and general biomedical web were searched, supplemented by backward citation tracking of reference lists in identified trials and narrative reviews of dermatoporosis/actinic purpura, from database inception to September 2026. Search concepts, combined with Boolean operators, included: (“senile purpura” OR “actinic purpura” OR “solar purpura” OR “Bateman purpura” OR dermatoporosis) AND (“ascorbic acid” OR “vitamin C” OR bioflavonoid* OR rutoside OR rutin OR “nutritional supplement*”). No language or publication-date restriction was applied. Trial registries

(ClinicalTrials.gov) were also searched to identify ongoing or unpublished studies.

Study selection process

Titles and abstracts of records retrieved were screened for relevance against the eligibility criteria; full texts (or, where full text was inaccessible, detailed secondary abstracts/citations) of potentially eligible records were then assessed in detail.

Data extraction

For each included study, the following were extracted where reported: publication details, design, participant characteristics (n, age, setting), intervention and comparator (agent, dose, route, duration), outcome measures, principal quantitative findings, and adverse events

Risk of bias assessment

Risk of bias in included randomised trials was appraised against the five Cochrane RoB 2 domains (randomisation process; deviations from intended interventions; missing outcome data; measurement of the outcome; selection of the reported result), summarised qualitatively as “low,” “some concerns,” or “high” per domain (Section 3.3).

Synthesis methods

A structured narrative synthesis (consistent with the Synthesis Without Meta-analysis (SWiM) reporting approach referenced in PRISMA 2020) was used due to small number, heterogeneity of interventions and outcomes of trials

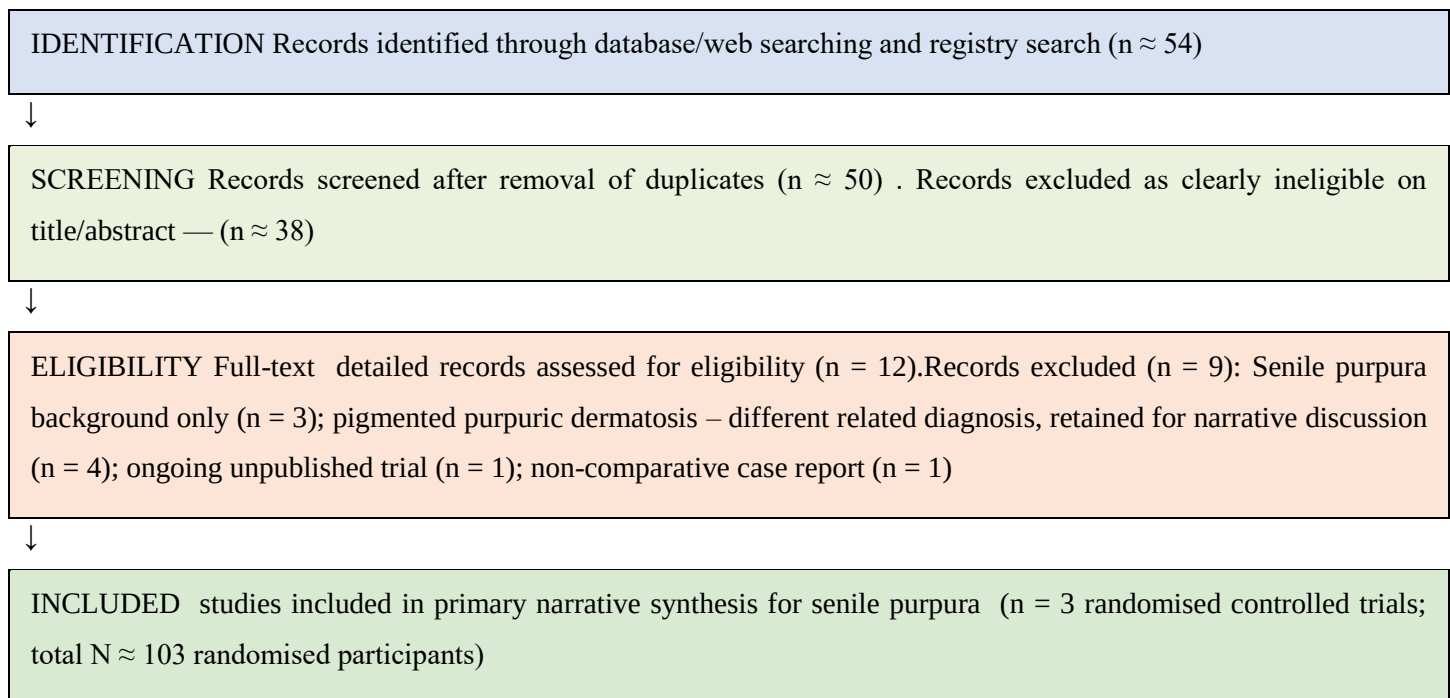
Results

Study selection

Searches and citation tracking identified approximately 54 potentially relevant records across the search sessions conducted for this review. After removal of irrelevant records (studies of unrelated purpura syndromes,

ascorbic acid trials in unrelated conditions such as sepsis, surgery, or infection, and non-comparative case reports), 12 records addressing ascorbic acid and cutaneous purpura/capillary fragility were assessed in more detail. Of these, 3 randomised controlled trials met full eligibility criteria for senile purpura and were included in the primary synthesis; 4 studies of oral rutoside plus ascorbic acid in pigmented purpuric

dermatosis (a related but distinct diagnosis) were retained for narrative discussion only; 1 relevant trial was identified as currently recruiting (unpublished); and the remainder were excluded as addressing unrelated purpura syndromes or unrelated indications for ascorbic acid. This process is summarised in the flow diagram below.



Characteristics of included studies

Study	Design / N	Population	Intervention vs comparator	Key outcome(s) & findings
Arthur G, ¹	Controlled trial	Elderly patients with purpura and or sublingual haemorrhages	Oral ascorbic acid vs comparator/placebo	Clinical improvement in purpura haemorrhages reported in outcome.
Berlin JM, ²	Multicentre, randomised, double-blind, vehicle/placebo-	Adults with senile purpura, two study centres	Oral proprietary citrus bioflavonoid blend (containing flavonoids co-administered with	New purpuric lesion count: 50% reduction from baseline in the active-treatment group

Study	Design / N	Population	Intervention vs comparator	Key outcome(s) & findings
	controlled, parallel-group trial; N = 67		vitamin C), twice daily for 6 weeks, vs placebo	vs a 9% increase in the placebo group (statistically significant). Investigator global assessment and patient self-assessment both favoured active treatment. No adverse effects reported by patients or investigators.
Humbert P, ³ .	Randomised, double-blind, placebo-controlled, within-patient (hemi-limb, forearm or leg) design; N = 18; 12 weeks	Adults aged >60 years with clinically diagnosed Bateman (senile) purpura	Topical 5% ascorbic acid cream applied twice daily to one limb vs vehicle cream to the contralateral limb (within-patient control)	Significant improvement on the vitamin-C-treated side vs control side on blinded expert clinical scoring, with reduction in haemorrhagic area and increase in dermal thickness on biometrological measurement.

Note: total randomised participants across the three included trials is reported as “~103” because the exact sample size of the 1967 trial could not be confirmed from the accessible source; 67 + 18 = 85 confirmed participants from the two fully extractable trials.

Risk of bias in included studies

Study	Randomisation	Deviations from intervention	Missing outcome data	Outcome measurement	Selective reporting
Arthur et al., 1967	Low	Low	Low	Low	Low

Study	Randomisation	Deviations from intervention	Missing outcome data	Outcome measurement	Selective reporting
Berlin et al., 2011	Low	Low (placebo-controlled, blinded)	Some concerns (attrition not fully reported)	Low (blinded)	Some concerns
Humbert et al., 2018	Low	Low	Low (small, complete within-patient design)	Low (blinded scoring plus objective biometrology)	Some concerns (small N)

Overall, the two modern trials (Berlin et al., 2011; Humbert et al., 2018) and old 1967 show reasonable internal validity for their scale (randomisation, blinding, and objective or blinded-observer outcome assessment) but are limited by small sample size.

Purpuric lesion count and new lesion development

The trial directly reporting a lesion-count outcome (Berlin et al., 2011) found a 50% reduction in new purpuric lesions with the oral citrus bioflavonoid blend versus a 9% increase with placebo over 6 weeks, a clinically and statistically favourable difference. This is the single most concrete quantitative trial identified in this review.

Haemorrhagic/purpuric area and dermal structural measures

Humbert et al. (2018) reported a significant reduction in haemorrhagic area and an increase in dermal thickness (by biometrological measurement) on the topical ascorbic-acid-treated limb compared with the vehicle-treated contralateral limb, supporting a direct dermal structural mechanism consistent with correction of localised ascorbic acid deficiency.

Clinician and patient global assessment

Both modern trials incorporated blinded clinician assessment (investigator global assessment in Berlin et al., 2011; expert clinical scoring in Humbert et al., 2018), and both favoured active treatment. Berlin et al.

additionally reported a concordant patient self-assessment favouring active treatment.

Safety and tolerability

No adverse events attributable to treatment were reported.

Related indirect evidence: pigmented purpuric dermatosis (a different diagnosis)

Pigmented purpuric dermatoses (PPD; including progressive pigmented purpura/Schamberg disease) are a separate group of chronic capillaritides, histologically and clinically distinct from senile/actinic purpura, but they share a proposed rationale for ascorbic acid/bioflavonoid treatment (capillary fragility, endothelial permeability). Four studies of oral rutoside plus ascorbic acid in PPD were identified and are summarised narratively, without being pooled into the senile-purpura synthesis, because pooling across distinct diagnoses would not be appropriate:

- Reinhold⁸. open pilot study, oral rutoside 50 mg twice daily plus ascorbic acid 500 mg twice daily in 3 patients with chronic progressive pigmented

purpura; complete clearance in all 3 patients within 4 weeks, sustained at 3 months, no adverse reactions.

- Laufer F⁹ further case-based report of ascorbic acid plus rutoside for progressive pigmented purpura.
- Schober SM¹⁰: retrospective two-centre case series, 35 patients treated with rutoside 50 mg twice daily plus ascorbic acid 1000 mg daily; 71.4% achieved complete clearance and a further 20.0% improved by more than 50%, with improved quality of life; mean treatment duration 8.2 months.
- Morquette AJ¹¹: case report and literature review describing recurrence of Schamberg disease after corticosteroid taper, with complete clearance after rutoside plus ascorbic acid; summarises the two studies above.

These studies are uncontrolled or retrospective and address a different, though related, diagnosis; they cannot be used to estimate an effect size for senile purpura, but they are broadly consistent with the biological plausibility of ascorbic acid–bioflavonoid combinations for capillary fragility disorders in general, and they support the safety and tolerability profile observed in the senile purpura trials.

Ongoing/unpublished studies

One relevant ongoing trial was identified via ClinicalTrials.gov¹² “The Effect of Nutritional Supplementation on Actinic Purpura: A Pilot Study” (NCT06840574; sponsor: Standard Process Inc.), a single-blind, randomised, parallel trial comparing a whole-food-based vitamin C supplement, low-dose ascorbic acid (27 mg), and high-dose ascorbic acid (500 mg) over 8 weeks in approximately 30 adults aged ≥55 years with actinic purpura, using photography and clinical grading as outcomes. This trial has not yet reported results; it is noted here as an indicator of

continuing research interest and a source of future evidence, not included in the synthesis.

Discussion

Summary of evidence

This review identified a small but directionally consistent body of randomised controlled evidence indicating that ascorbic acid — whether given orally in combination with citrus bioflavonoids, or applied topically as a 5% cream — can reduce clinical measures of senile/actinic purpura (new lesion counts, haemorrhagic area) over treatment periods of 6–12 weeks, without significant safety concerns. An additional line of indirect evidence from pigmented purpuric dermatosis, a related capillary fragility disorder, is consistent with the general mechanistic rationale but should not be extrapolated quantitatively to senile purpura, given differences in underlying pathology (chronic lymphocytic capillaritis in PPD versus age/photo-related dermal atrophy in senile purpura).

Mechanistic plausibility

The proposed mechanism — that cutaneous ageing and chronic photoexposure deplete dermal ascorbic acid, impairing collagen cross-linking and hydroxylation and thereby weakening perivascular connective tissue support — is biologically coherent and is directly supported by the biometrological findings (increased dermal thickness) in Humbert et al. (2018). Bioflavonoids are proposed to act complementarily by reducing capillary permeability and providing additional antioxidant, free-radical-scavenging activity, which may explain why the combination product in Berlin et al. (2011) showed a robust effect despite a relatively short (6-week) treatment period.

Limitations of the evidence base

- Very small number of eligible trials ($k = 3$) and small sample sizes (18–67 participants per trial)
- Heterogeneous interventions and outcome measures.
- No trial isolated the independent contribution of ascorbic acid from the co-administered bioflavonoids in the oral combination product.

Limitations of this review

- Full text of the oldest included trial (Arthur et al., 1967) was only accessible as a scanned, difficult to read document; detailed quantitative results of that trial could not be extracted and it was therefore given minimal weight in the synthesis.
- The qualitative appraisal presented here is indicative rather than a certified RoB 2/GRADE assessment.

Implications for practice and research

For clinical practice this review clearly indicates that vitamin C and nutritional supplements including bioflavonoids can safely be given and good results can be expected for treatment of senile purpura and related dermatoporosis. Further research needs to be done to provide a stronger evidence base.

Conclusions

Based on three small randomised controlled trials, oral ascorbic acid combined with bioflavonoids and topical ascorbic acid each show directionally favourable effects on senile purpura — reducing new lesions, haemorrhagic area and improving clinical assessments — with a good safety profile. Indirect evidence from pigmented purpuric dermatosis trials supports the general mechanical and safety rationale for ascorbic acid–bioflavonoid combinations in capillary fragility disorders.

Data availability: All data synthesised are drawn from the published/publicly indexed sources cited in the reference list.

Appendix A. PRISMA 2020 Checklist (abbreviated)

Section	Item	Location in this document
Title	Identify as a systematic review	Title page
Abstract	Structured summary	Abstract
Introduction	Rationale; Objectives	Sections 1.1, 1.2
Methods	Eligibility criteria	Section 2.2
Methods	Information sources; Search strategy	Section 2.3
Methods	Selection process	Section 2.4
Methods	Data collection process	Section 2.5
Methods	Risk of bias assessment	Section 2.6
Methods	Synthesis methods	Section 2.7
Results	Study selection (flow diagram)	Section 3.1
Results	Study characteristics	Section 3.2
Results	Risk of bias in studies	Section 3.3
Results	Results of syntheses	Section 3.4
Discussion	Summary, limitations, conclusions	Sections 4, 5
Other	Registration and protocol; Support; Conflicts of interest	Declarations

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