Vitamin D as an adjunct therapy in the treatment of atopic dermatitis: a targeted review

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Background & Objectives

Atopic dermatitis (AD) is one of the most prevalent dermatological conditions with autoimmune elements[1]. The symptoms, such as itchiness, depression, sleep disturbances, and anxiety, significantly impact the daily lives and well-being of individuals affected by AD, hence decreasing their quality of life[2]. Consequently, there is a significant amount of research effort dedicated to investigating and developing new treatments for AD, reflecting the growing demand for more effective therapeutic options for patients[3]. Vitamin D has been found to modulate the immune system, and therefore may be a beneficial adjunct therapy in the treatment of AD.

This review aimed to identify literature assessing vitamin D supplementation and its effect on AD.

Methods

Clinical study publications in AD from the last 15 years (January 1, 2008 onwards), involving vitamin D dose supplementation, were identified through targeted searches of the PubMed database, Google Scholar, and snowballing. Studies supplementing with low to moderate doses of vitamin D (400-2,000 IU) were included in this review, due to this dose range's beneficial effect in increasing vitamin D status, but with reduced activation of the catabolic pathway relative to higher doses[4]. Both forms of vitamin D were included in the search: vitamin D_3 (cholecalciferol) and D_2 (ergocalciferol).

Results

Nine clinical studies exploring the impact of vitamin D supplementation on AD outcomes were included (see **Table 1**). All enrolled children and/or adolescents, and two also enrolled adults. Participant numbers ranged from 5 to 58. The majority of studies (78%) included participants with all severities of AD; one included only severe AD and one only mild AD.

All studies involved daily oral supplementation, with the duration of supplementation ranging from 1 to 3 months: 3 months in four studies and 2 months in three studies. Six studies (67%) assessed the use of vitamin D_3, only one study used vitamin D_2, and two did not state the form of vitamin D used. Daily supplementation doses ranged from 1,000 to 2,000 IU; five studies used doses of 1,000 IU. The majority of studies (78%) allowed for continued use of other AD therapies (including routine treatments in four studies).

Clinical tools used to assess AD outcomes included the SCORing Atopic Dermatitis index (SCORAD; n=5) and the Eczema Area and Severity Index (EASI; n=3). All studies reported a reduction in SCORAD (range 21-74%, n=7) or EASI (29%, from n=1 of 2 reporting) score post-vitamin D supplementation, indicating improvement in clinical outcomes. No studies investigated patient-reported outcomes (PROs).

Discussion & Conclusions

Evidence suggests that vitamin D doses of 1,000-2,000 IU can be a beneficial adjunct therapy in the treatment of AD. The use of vitamin D should, therefore, be considered when developing treatment strategies for AD. The most commonly used clinical tool to assess clinical AD outcomes was SCORAD, followed by EASI. However, the absence of PROs highlights a gap that should be addressed in future vitamin D supplementation research in AD. Some suitable measures that could be used to capture any quality of life benefits associated with vitamin D supplementation in AD include the Dermatology Life Quality Index (DLQI), the Patient-Oriented Eczema Measure (POEM), or the Pruritus/Itch Numeric Rating Scale (NRS). These measures capture AD impacts ranging from sleep quality to itchiness, and could help when investigating how the addition of vitamin D to the treatment regime may affect these domains.

Both a strength and a limitation of this review is the inclusion of all severities of AD in the studies reviewed. The evidence of vitamin D's effectiveness as a supplementary therapy is relevant to a broad population of patients with AD rather than only specific sub-groups. However, the challenge is not being able to differentiate the quantitative effects of vitamin D supplementation on different AD severities.

To conclude, more research is needed on whether vitamin D, used in conjunction with other AD management strategies, can contribute to improved quality of life for individuals with this skin condition.

References

[1] Skin conditions by the numbers. *American Academy of Dermatology.* Updated 2023. https://www.aad.org/media/stats-numbers

[2] Fasseeh AN, Elezbawy B, Korra N et al. Burden of atopic dermatitis in adults and adolescents: a systematic literature review. *Dermatol Ther (Heidelb)* 2022;12(12):2653-2668. doi: 10.1007/s13555-022-00819-6

[3] Hajar T, Gontijo JRV, Hanifin JM. New and developing therapies for atopic dermatitis. *An Bras Dermatol.* 2018 Jan-Feb;93(1):104-107. doi: 10.1590/abd1806-4841.20187682

[4] Saleh L, Tang J, Gawinecka J et al. Impact of a single oral dose of 100,000 IU vitamin D3 on profiles of serum 25(OH)D3 and its metabolites 24,25(OH)2D3, 3-epi-25(OH)D3, and 1,25(OH)2D3 in adults with vitamin D insufficiency. *Clin Chem Lab Med* 2017;55(12):1912-1921. doi: 10.1515/cclm-2016-1129

Table 1. Overview of studies included in the review

No.	Author	No. of participants receiving vitamin D	AD severity	Vitamin D form	Vitamin D dose (IU)	Effectiveness (difference from baseline mean)
1	Aldaghi et al. 2022	27	All severities	D_3	1,000	Reduction in SCORAD score by 36%
2	Raj et al. 2022	35	All severities	D_3	1,000	Reduction in SCORAD score; range: 21-74%
3	Mansour et al. 2020	47	Severe	D_3	1,600	Reduction in EASI score by 56%
4	Lara-Corrales et al. 2019	21	All severities	N/S	2,000	Reduction in SCORAD score by 44%
5	Di Filippo et al. 2015	39	All severities	N/S	1,000	Reduction in SCORD score by 51%
6	Camargo et al. 2014	58	All severities	D_3	1,000	Reduction in EASI score by 29%
7	Amestejani et al. 2012	30	All severities	D_3	1,600	Reduction in SCORAD score by 38%
8*	Javanbakht et al. 2010	12	All severities	D_3 + vitamin E placebo	1,600	Reduction in SCORAD score by 35%
8*	Javanbakht et al. 2010	11	All severities	D_3 + vitamin E	1,600	Reduction in SCORAD score by 64%
9	Sidbury et al. 2008	5	Mild	D_2	1,000	Reduction in EASI score; N/S

* Javanbakht et al. 2010 publication included twice, as two groups received different vitamin D treatment combinations.
AD = atopic dermatitis, IU = international units, SCORAD = SCORing Atopic Dermatitis index, EASI = Eczema Area and Severity Index, N/S = not specified

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