LETTERS TO THE EDITOR

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Exploring the Therapeutic Potential of Topical Honey in Atopic Dermatitis

Dear Editor:

Honey is one of the oldest natural medicines and has been shown to have antimicrobial, anti-inflammatory, and antioxidant properties. Though topical honey is most well known in the context of treating wounds, several studies have investigated the use of topical honey in the management of atopic dermatitis (AD). Preliminary evidence suggests that topical honey is a promising treatment option, though the mechanisms by which honey produces therapeutic benefits in AD are not yet well understood. Several therapeutic mechanisms have been proposed, including modulation of the skin microbiome, activation of aryl hydrocarbon receptor (AHR) signaling, and modulation of local prostaglandin and nitric oxide (NO) synthesis and activity.

On January 19, 2025, an online search was conducted using the databases PubMed, Embase, and Web of Science to identify all published clinical trials investigating the use of honey in the treatment of AD in human participants. This search yielded 5 studies that met our inclusion/exclusion criteria. A detailed summary of all study characteristics and outcomes can be found in **Table 1**. Four studies reported that treatment with topical honey resulted in statistically significant improvements in AD symptoms using measures of severity including Three-Item Severity scores, SCORing Atopic Dermatitis, and Visual Analog Scale (VAS).[1–4] One study also measured outcomes in eczematous external otitis using VAS and found that VAS scores for discomfort and itching significantly decreased after 2 weeks of treatment with honey eardrops.[3] Only 1 of the 5 studies reported that treatment with honey was not significantly more efficacious than control (aqueous cream).[5] Two studies collected bacterial swabs of lesions before and after honey treatment.[2,3] While both studies found that treatment with manuka honey did not significantly change skin culture results of *Staphylococcus aureus*, 1 study did find that in some participants, honey eardrops led to a shift from commensal bacterial colonization pretreatment to negative culture posttreatment.[2,3] Interestingly, 1 study found that adding topical honey as part of the treatment regimen enabled patients previously using topical corticosteroids to reduce their dose by 75% without clinical deterioration or exacerbation of symptoms.[1] This suggests that topical honey may be especially useful as an adjunct therapy to optimize symptom control while using lower doses of conventional treatments like topical corticosteroids, minimizing the risk of adverse effects. Topical honey was generally well tolerated across all studies with minimal adverse events (increased itching in 1 patient in 1 study).[5]

While preliminary evidence for topical honey in AD is promising, existing research is significantly limited by small sample sizes, the absence of double-blinded design, and the lack of controls. Financial and technical barriers, along with limited interest from clinicians and industry, are challenges that likely contribute to the scarcity of rigorous trials. Future studies should address sample size, randomization, blinding, and control comparisons and investigate the biochemical pathways through which medicinal honey affects AD.

With regard,

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TABLE 1. Summary of human studies of honey in the treatment of atopic dermatitis

STUDY DESIGN (# OF PARTICIPANTS)	AGE, GENDER DISTRIBUTION	AD SEVERITY	PARTICIPANT GROUPS	HONEY USED	TREATMENT REGIMEN	DURATION	MEASURED OUTCOME(S)	RESULTS	ADVERSE EVENTS
Partially controlled, single-blinded study (N=21)[1]	5–16 years 4 female, 17 male	Moderate-to-severe	**Group 1:** 10 patients receiving no treatment at beginning of study; **Group 2:** 11 patients using topical corticosteroids 3 to 6 months prior to beginning study	**Group 1:** Honey mixture (1:1:1 natural unprocessed honey, beeswax, olive oil); **Group 2:** Honey + steroid mixtures A, B, and C with 1:1, 2:1, and 3:1 ratios, respectively, of natural honey and betamethasone esters 0.1%	**Group 1:** Petrolatum to the right side, honey mixture to the left side, applied 3 times daily for 2 weeks. If honey was effective but petrolatum was not, petrolatum was replaced with the honey mixture after 2 weeks. **Group 2:** 1:1 petrolatum:betamethasone esters 0.1% to the right side, mixture A to the left side, applied 3 times daily for 2 weeks. If responsive to petrolatum:betamethasone but not mixture A, participants were excluded. If no response, crossover to mixture A for 2 weeks; if effective, switched to mixture B for 2 weeks, then to mixture C for another 2 weeks if responsive.	**Group 1:** 4 weeks **Group 2:** 6 weeks	Erythema, scaling, lichenification, excoriation, induration, papulation, oozing, crusting, and reported intensity of pruritis each assigned a score from 0-4, total score sum of each of these scores (range: 0-28)	**Group 1:** 8 of 10 patients significantly improved after 2 weeks of treatment with honey mixture **Group 2:** 5 of 11 patients showed no deterioration after reducing betamethasone dose by 75% with use of mixture C. However, after 6 weeks, replacing mixture C with honey mixture (ie, complete withdrawal of corticosteroid treatment) led to deterioration of AD signs and symptoms in patients using topical steroids before the study	None reported
Open-label single-blind randomized controlled trial (N=15)[5]	Mean: 37.1 (SD: 12.1) 8 female, 7 male	N/A	1 group; each patient applied honey to 1 side of the body and negative control to the other side	Medical-grade Kanuka honey	Honey to a representative lesion on 1 side of the body and aqueous cream (negative control) to a lesion on the other side, applied every night then covered with a nonadherent dressing overnight for 2 weeks	2 weeks	SCORAD* score, TIS** score, subjective itch score	Change in lesion severity/intensity was not statistically different between lesions treated with Kanuka honey and those treated with negative control (aqueous cream) when measured using SCORAD, TIS, or subjective itch ratings.	1 patient reported increased itch with honey application
Proof of concept, open-label, pilot study (n=14)[2]	Mean: 33 (SD: 10) 8 female, 6 male	N/A	1 group, each patient applied honey to one lesion and a lesion of similar severity was left untreated as a control	Manuka honey	Honey applied to lesion, covered with gauze overnight, and washed off in the morning. Control lesion left untreated unless they became intolerable at which point regular treatment (topical steroid or calcineurin inhibitor) was permitted.	7 days	TIS** score	Mean TIS score of lesions treated with honey was significantly less after treatment. Mean TIS score of control lesions was not significantly changed after 7 days.	None reported
							Bacterial swab	Treatment with manuka honey did not significantly change skin culture results of *Staphylococcus aureus*.	

*The SCORAD scale includes area affected, intensity (redness, swelling, oozing/crusting, scratch marks, lichenification, dryness), and subjective symptoms (itch and sleeplessness), with higher scores representing more severe symptoms.
**The TIS score includes erythema, edema/papulation, and excoriation, each on a scale of 0-3 for a combined score ranging from 0-9.
N/A: not applicable; SCORAD: SCORing Atopic Dermatitis; TIS: Three-Item Severity; VAS: visual analog scale.

TABLE 1 CONTINUED. Summary of human studies of honey in the treatment of atopic dermatitis

STUDY DESIGN (# OF PARTICIPANTS)	AGE, GENDER DISTRIBUTION	AD SEVERITY	PARTICIPANT GROUPS	HONEY USED	TREATMENT REGIMEN	DURATION	MEASURED OUTCOME(S)	RESULTS	ADVERSE EVENTS
Proof-of-concept study (N=15)[3]	Mean: 63 (range: 46–89) 3 female, 12 male	N/A	All honey treated, no control group	Honey eardrops	Honey eardrops used 3 times daily	2 weeks	Patient-completed VAS	VAS scores for discomfort and itching decreased significantly after treatment.	None reported
							Blinded scoring by otologists of standardized photos of external auditory canal based on redness and scaling	Scores based on redness and scaling (scored by blinded otologists) decreased significantly after treatment.	
							Bacterial swab	Before treatment, 4 patients had *S aureus* infections, 1 had a *Candida parapsilosis* infection, and 10 patients had commensal bacteria colonization. After treatment, 4 patients had change from commensal colonization to negative culture. Treatment had no effect on *S aureus* infections.	
							Broth microdilution assay using *S aureus*, *E coli*, *P aeruginosa*, *S pneumoniae*, and coagulase-negative staphylococci treated with honey eardrops vs acid eardrops with hydrocortisone 1%	Honey eardrops inhibited growth at concentrations ranging from 3% to 12.5% (comparable to acid + hydrocortisone eardrops) independent of bacterial resistance.	
Open label, unblinded study (N=12)[4]	N/A	N/A (average baseline TIS score of 6)	All honey treated, no control group	Natural raw honey	Natural raw honey applied to lesion, covered with transparent dressing, then washed off	7 days	TIS** score	Significant improvement (TIS score decrease from 6 to 1 after 1 week of treatment)	None reported

*The SCORing Atopic Dermatitis (SCORAD) scale includes area affected, intensity (redness, swelling, oozing/crusting, scratch marks, lichenification, dryness), and subjective symptoms (itch and sleeplessness), with higher scores representing more severe symptoms.
**The Three-Item Severity (TIS) score includes erythema, edema/papulation, and excoriation, each on a scale of 0–3 for a combined score ranging from 0–9.
N/A: not applicable; SCORAD: SCORing Atopic Dermatitis; TIS: Three-Item Severity; VAS: visual analog scale.