SHORT COMMUNICATION

Efficacy and Safety of Dupilumab vs Narrowband UVB for the Treatment of Chronic Hand Dermatitis: A Retrospective Study

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Hand dermatitis (HD) has an estimated 1-year prevalence of up to 10% and can significantly impact patients' quality of life (QoL) (1). Chronic hand dermatitis (CHD) occurs when HD lasts over 3 months or recurs twice annually (2). CHD can be classified by morphology as hyperkeratotic hand dermatitis (HHD), fingertip dermatitis (FTD), and dyshidrotic hand eczema (DHE) (1, 3). CHD is one of the most frequent occupational skin diseases, posing a significant economic burden (1). Given the condition's widespread impact, identifying effective and safe treatments is crucial.

For years, the primary treatments for CHD have included irritant and allergen avoidance, emollients, patient education, and medical therapies including topical corticosteroids and photo- or systemic therapies (4).

The use of narrowband ultraviolet B (NB-UVB) has shown moderate-to-high efficacy in CHD across multiple studies, with 42.9–91.7% of patients demonstrating improvement. Minimal adverse effects included erythema and xerosis (5–7). NB-UVB therapy may have limited efficacy in some patients and the need for frequent visits may render it suboptimal.

Systemic therapies for CHD are limited, with alitretinoin being the only approved oral treatment (8). However, alitretinoin can be ineffective in some patients and is associated with side effects such as headache, xerosis, dyslipidaemia, teratogenicity, and elevated liver enzymes (8). Dupilumab, a human monoclonal antibody that targets interleukin (IL)-4 receptor α, inhibiting signalling induced by both IL-4 and IL-13, was approved by the US FDA, EMA, and Health Canada for use in moderate-to-severe atopic dermatitis (AD) (9). Case reports, retrospective, and prospective studies have shown dupilumab's efficacy as a potential treatment for CHD and reported no serious adverse events (AEs) with its use (9–13).

Limited research supports the range of options to treat patients with CHD refractory to corticosteroids. Here, we utilized a retrospective cohort study, aiming to assess the effectiveness and safety of dupilumab compared with NB-UVB for the treatment of this population.

MATERIALS AND METHODS

A retrospective review of electronic medical records (January 2019–May 2024) identified adult patients (≥18 years) diagnosed with CHD (including HHD, DHE, and FTD subtypes), treated with dupilumab or NB-UVB, after failing ≥8 weeks of potent topical corticosteroids. Patients had moderate-to-severe CHD with a Physician Global Assessment (PGA) score of 3–4. NB-UVB patients received thrice-weekly therapy at the phototherapy unit at McMaster University. Dupilumab patients received the approved dose for moderate-to-severe AD. Exclusions included incomplete NB-UVB therapy, use of concomitant off-label systemic therapy for AD (e.g., methotrexate), or off-protocol dupilumab doses. This was a real-life study, and both groups used corticosteroids as needed. PGA and Dermatology Life Quality Index (DLQI) scores were measured at baseline and week 16.

The primary outcome was percentage of patients achieving a PGA score of 0/1 at week 16. Secondary outcomes included mean DLQI score at week 16, ≥50% DLQI reduction from baseline, and adverse effects. This study was approved by the Hamilton Integrated Research Ethics Board (ID:16357).

Statistical analysis

Continuous variables are presented as mean ± standard deviation. Categorical variables are expressed as a median and range or a number and percentage. The Mann–Whitney *U* test compared the change in PGA and DLQI scores between groups. The Wilcoxon signed ranks test compared within-group changes in PGA and DLQI from baseline to 16 weeks. Fisher's exact test compared differences between categorical variables between groups. The data were analysed in Statistical Package for the Social Sciences (29.0.2.0; IBM Corp, Armonk, NY. USA) and Microsoft Excel (Microsoft Corp, Redmond, WA, USA). Two-tailed *p*-values were used, and alpha was set at $p < 0.05$.

RESULTS

Sixty-three patients (mean age 39.1 years, 44.4% [*n*=28/63] male) were analysed (**Table I**). HHD was most common (73.0%, *n*=46/63), followed by DHE (19.0%, *n*=12/63), and FTD (7.9%, *n*=5/63). Disease duration averaged 6.0 years (range: 1–20). Asthma and allergic rhinitis were noted in 28.6% (*n*=18/63) and 17.5% (*n*=11/63), respectively.

Thirty-three patients received NB-UVB therapy, and 30 received dupilumab. Both treatments significantly reduced disease severity at 16 weeks ($p < 0.001$) (**Table II**). Dupilumab resulted in a greater proportion of patients achieving a PGA score of 0/1 compared with NB-UVB (66.7% [*n*=20/30] vs 39.4% [*n*=13/33], $p = 0.044$).

DLQI scores improved significantly in both cohorts ($p < 0.001$); however, there was no significant difference in mean final DLQI scores ($p = 0.729$) (Table II). Patients reporting "no" or "mild" impact on life were comparable

Table I. Baseline characteristics of patients

Factor	All ($n=63$)	NB-UVB ($n=33$)	Dupilumab ($n=30$)
Mean age±SD	39.1±12.6	42.0±12.1	35.8±12.5
Male, *n* (%)	28 (44.4%)	15 (45.5%)	13 (43.3%)
Fitzpatrick skin types (%)			
1	9 (14.3%)	6 (18.1%)	3 (10.0%)
2	20 (31.7%)	7 (21.2%)	13 (43.3%)
3	14 (22.2%)	9 (27.2%)	5 (16.7%)
4	11 (17.5%)	6 (18.2%)	5 (16.7%)
5	6 (9.5%)	3 (9.1%)	3 (10.0%)
6	3 (4.8%)	2 (6.1%)	1 (3.3%)
Diagnoses (%)			
HHD	46 (73.0%)	24 (72.7%)	22 (73.3.0%)
DHE	12 (19.0%)	6 (18.2%)	6 (20.0%)
FTD	5 (7.9%)	3 (9.1%)	2 (6.7%)
Mean duration of disease in years±SD	6.0±4.3	5.4±4.6	6.7±3.9
Initial PGA scores (%)			
3	30 (47.6%)	16 (48.5%)	14 (46.7%)
4	33 (52.4%)	17 (51.5%)	16 (53.3%)

DHE: dyshidrotic hand eczema; DLQI: Dermatology Life Quality Index; FTD: fingertip dermatitis; HHD: hyperkeratotic hand dermatitis; NB-UVB: narrow band UVB therapy; SD: standard deviation; PGA: Physician Global Assessment.

between dupilumab (46.2%, $n=12/26$) and NB-UVB (27.3%, $n=9/33$) ($p=0.274$).

AEs occurred in 23.3% ($n=7/30$) of dupilumab patients, and 15.2% ($n=5/33$) of NB-UVB patients. AEs from NB-UVB included UV burn (3.0%, $n=1/33$), burning sensation (6.1%, $n=2/33$), and dry skin (9.1%, $n=3/33$). Dupilumab AEs included mild injection-site reactions (13.3%, $n=4/30$), facial redness (3.3%, $n=1/30$), mild blepharitis (3.3%, $n=1/30$), and headache (3.3%, $n=1/30$).

DISCUSSION

CHD disrupts QoL and work, with limited treatment options for steroid-refractory cases (1). This study showed that dupilumab achieved greater improvement in disease severity reflected by a higher proportion of patients achieving PGA 0/1.

Dupilumab's effectiveness in CHD is supported by prospective studies, retrospective studies, and case reports examining a wide range of CHD presentations (including atopic HD, vesicular HD, hyperkeratotic HD, allergic contact dermatitis, and irritant contact dermatitis) (9–15). A 2023 randomized trial reported that 95% of dupilumab-treated patients achieved a 75% reduction in Hand Eczema Severity Index (HECSI) over 52 weeks, showing sustained remission (12). Dupilumab's suppression of Type 2 inflammatory response via IL-4 and IL-13 inhibition confers efficacy in atopic CHD (9). Dupilumab also reduces expression of keratins and proliferative markers, while increasing loricrin expression (10). These mechanisms may aid in improving the impaired epidermal barrier seen in all CHD subtypes.

NB-UVB has demonstrated efficacy in resolving CHD in multiple studies, but with few cases of complete clearance (5–7). Between 7% and 13% of patients withdrew due to AEs or treatment failure in these studies (5–7). NB-UVB therapy was less effective than dupilumab, potentially due to the higher proportion of HHD patients, as thickened and hyperkeratotic changes may hinder NB-UVB penetration to dermal lymphocytes (7).

Treatment choice should reflect individual patient needs, including preference for pharmacologic vs phototherapy, local availability of phototherapy units, and access to dupilumab. Dupilumab offers a favourable safety profile, but its high cost can pose access barriers. NB-UVB is a longstanding, safe treatment option, though it requires geographic availability and frequent visits, which may be inconvenient for patients. Neither therapy requires laboratory monitoring and both are viable options for CHD. Guidelines emphasize the need for a deeper understanding of the relationship between disease subtypes and treatment responses to optimize therapeutic choices (2).

Limitations include the small sample size, retrospective design, and uneven distribution of CHD subtypes. Previous studies have described varied effectiveness of both dupilumab and NB-UVB for each subtype, with HHD being resistant to both, therefore interpretation of our results may be impacted by the relatively fewer number of patients with FTD and DHE (6, 11).

Table II. Results at 16 weeks of CHD treated with dupilumab versus NB-UVB

Variable	NB-UVB ($n=33$)	Dupilumab ($n=30$)	*p*-value
Mean final PGA score (range)	1.7 (0–3)	1.4 (0–3)	0.129
Median final PGA Score (range)	2 (0–3)	1 (0–3)	0.129
Final PGA scores of 0–1, *n* (%)	13 (39.4%)	20 (66.7%)	0.044*
Mean final DLQI score±SD	6.0±2.2	6.6±2.8	0.729
Patients with >50% reduction in final DLQI score, *n* (%)	14 (42.4%)	12 (40.0%)	0.798
Adverse effect of any type, *n* (%)	5 (15.2%)	7 (23.3%)	0.525

DLQI: DQLI: dermatology life quality index; NB-UVB: narrow band UVB therapy; PGA: Physician Global Assessment; SD: standard deviation. *$p<0.05$.

In conclusion, both dupilumab and NB-UVB significantly improved CHD severity and QoL, supporting these therapies as viable options for refractory disease management.

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