

Received Date : 25-Sep-2016

Revised Date : 08-Nov-2016

Accepted Date : 10-Nov-2016

Article type : Research Letter

## **The Relationship Between Disease Severity in Discoid Lupus Erythematosus and Quality of Life**

Word count: 796

Table count: 1

Figure count: 1

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Funding sources: none.

Conflicts of interest: none.

Dear Editor,

Discoid Lupus Erythematosus (DLE) is a chronic scarring skin condition and a subset of cutaneous lupus as defined by Gilliam and Sontheimer (1). It is a common form of cutaneous lupus in a European population (CLE) (2) .

**This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.1111/bjd.15227](https://doi.org/10.1111/bjd.15227)**

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The objective of this study was to assess the effect of DLE severity on quality of life (QOL). QOL was measured by the patient using the Dermatology Life Quality Index (DLQI) and correlated with the severity of their disease objectively assessed by using the Cutaneous Lupus Disease Area and Severity Index (CLASI). CLASI is a validated tool that enables physicians to assign a score to the severity of cutaneous lupus (3). An activity score is calculated from the degree and area of erythema, scale and hypertrophy as well as any mucous membrane involvement and alopecia. A damage score is calculated from the dyspigmentation and scarring seen. The Dermatology Life Quality Index (DLQI) is a validated measure of QOL with a maximum score of 30, with increasing score indicating an increasing impact on quality of life (4). Additionally, Māori and Pacific Islanders were examined as a combined specific sub-group as in New Zealand, Māori and Pacific Islanders are at particular risk of DLE with an age and sex adjusted relative risk (95% confidence interval [CI]) of 5.96 (3.06–11.6) compared to European New Zealanders (5).

This cross-sectional study recruited patients through written invitation and opportunistic screening in the dermatology clinics at Middlemore Hospital, Auckland and Waikato Hospital, Hamilton. CLASI scoring was undertaken by one observer (AC) for consistency and a concurrent DLQI was established. The study received ethical approval from the Northern A New Zealand Health and Disability Ethics Committee, reference number 13/NTA/23. Statistical analysis was undertaken using SAS software version 9.3 (SAS Institute, Cary, NC, USA).

Fifty patients with DLE were recruited. There were 33 Māori and Pacific Island patients and 17 European patients. Forty-two (84%) of these patients were female. The mean age was 45.4 years (standard deviation [SD] 12.5). Supplementary file with additional demographics supplied.

The mean DLQI for these patients was 8.4 (SD 6.8) and the mean CLASI total score (activity and damage) was 20.1 (SD 13.1). The mean CLASI activity and damage scores were respectively 9.4 (SD 7.7) and 10.7 (SD 6.9). Sample correlations (Table 1) were calculated between DLQI and CLASI activity and damage with a statistically significant correlation found. Analysis by ethnic group also demonstrated a significant correlation amongst Māori and Pacific Islanders between CLASI activity and damage scores with DLQI. A similar but not significant correlation was found amongst European patients between CLASI activity and damage scores and DLQI. There was no difference between the Māori and Pacific Islander group and Europeans in DLQI or in CLASI activity and damage ( $p$ -value [ $p$ ]  $>0.05$ ) when examining each variable for mean difference.

Simple linear regression also confirmed the findings of the correlation scores with the individual scores with CLASI activity being associated with a 0.30 ( $p=0.01$ ) increase in DLQI and CLASI damage a 0.37 rise in DLQI ( $p=0.007$ ).

Pearson partial correlations were obtained to assess whether DLQI is linearly related to CLASI activity while controlling for CLASI damage and vice versa. Neither partial correlation was significant; the partial correlation was 0.16 (CI -0.13-0.42) with CLASI activity and 0.23 (CI -0.06-0.48) with CLASI damage. Confirmatory factor analysis (CFA) yields a more robust estimate of the true association between the DLQI and CLASI scores, as CFA controls for noise created, for instance, by outliers such as those seen on the scatterplots (Figures 1 and 2). CFA suggests that CLASI damage (CFA correlation=0.61) is more strongly associated with DLQI than CLASI activity (CFA correlation = 0.47).

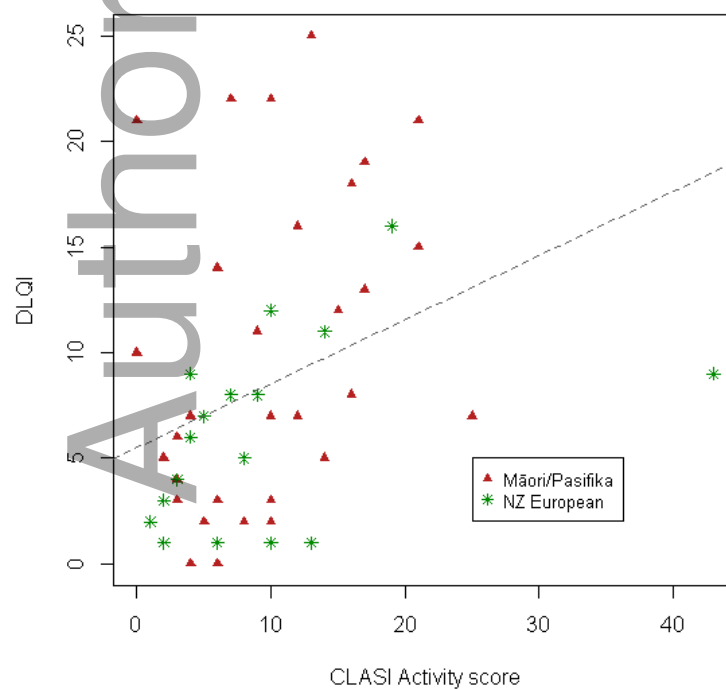
Although the Auckland participants were invited to participate from a population derived database of cutaneous lupus (5), patient selection was a limitation of this study because of the opportunistic recruitment in a mainly hospital based setting and therefore may reflect a biased spectrum of DLE.

The quality of life of patients with CLE is poor (6) and emotional well-being is particularly impaired (7). This study is the largest to date that has examined the correlation of objectively assessed disease severity in DLE with QOL using the DLQI. The SADDLE (Score of Activity and Damage in DLE) was developed for assessing DLE and estimated its correlation with DLQI in 9 patients with nonsignificant findings (8). A correlation has previously been seen between activity in DLE and depression(9). A study of the quality of life in cutaneous lupus in a different ethnic mix of patients in Philadelphia, USA, with a greater variety of cutaneous lupus showed no significant correlation between CLASI damage scores and Skindex-29 scores (10). However, in this study the results suggest that DLE scarring may be a more important driver of impaired QOL than DLE activity.

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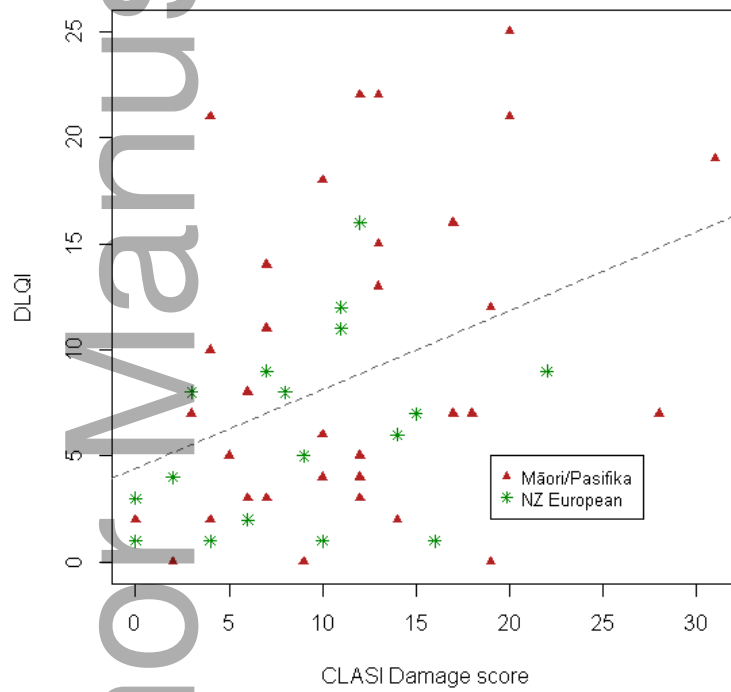
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Figure 1: Scatterplot of DLQI against CLASI activity score fitted with the linear regression line



DLQI, Dermatology Life Quality Index; CLASI, Cutaneous Lupus Erythematosus Disease Area and Severity Index.

Figure 2: Scatter plot of DLQI against CLASI damage score fitted with the linear regression line



DLQI, Dermatology Life Quality Index; CLASI, Cutaneous Lupus Erythematosus Disease Area and Severity Index.

Table 1: Sample correlations between DLQI and CLASI total, activity and damage scores overall and by ethnicity

Scores	Ethnicity	Correlation	95% confidence interval	P-value
CLASI activity score	Overall	0.35	0.07-0.57	0.013
	Māori/Pacific	0.38	0.04-0.64	0.031
	European	0.42	-0.07-0.75	0.09
CLASI damage score	Overall	0.38	0.11-0.60	0.0062
	Māori/Pacific	0.34	0.01-0.62	0.047
	European	0.37	-0.13-0.72	0.14

DLQI, Dermatology Life Quality Index; CLASI, Cutaneous Lupus Erythematosus Disease Area and Severity Index.



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**Title:**

The relationship between disease severity and quality of life in discoid lupus erythematosus

**Date:**

2017-10-01

**Citation:**

Gordon, H., Chandran, A., Vandal, A. C., Yung, A. & Jarrett, P. (2017). The relationship between disease severity and quality of life in discoid lupus erythematosus. BRITISH JOURNAL OF DERMATOLOGY, 177 (4), pp.1134-1135. <https://doi.org/10.1111/bjd.15227>.

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