Supplementary Information

Impact of Facial Atrophic Acne Scars on Quality of Life: A Multi-country Population-based Survey

Jerry Tan[1], Stefan Beissert[2], Fran Cook-Bolden[3], Rajeev Chavda[4], Julie Harper[5], Adelaide Hebert[6], Edward Lain[7], Alison Layton[8], Marco Rocha[9], Jonathan Weiss[10], Brigitte Dréno[11],*

Affiliations

[1]Western University Canada, Schulich School of Medicine and Dentistry, 2224 WALKER ROAD, SUITE 300 WINDSOR, ONTARIO N8W 5L7

[2]Department of Dermatology, University Hospital Carl Gustav Carus, TU Dresden, Fetscherstrasse 74, D-01307 Dresden, Germany

[3]Mount Sinai Department of Dermatology, New York, 5 East 98th Street, New York, NY 10029

[4]GALDERMA, Rue d'Entre-deux-Villes 10 - 1814 La Tour-de-Peilz, Switzerland

[5]The Dermatology and Skin Care Center of Birmingham, 2470 Rocky Ridge Rd # 100, Vestavia Hills, AL 35243, USA

[6]The University of Texas Medical School – Houston, 6655 Travis, Suite 980, Houston, TX 77030

[7]Austin Institute for Clinical Research, 1601 E Pflugerville Pkwy Suite 1101, Pflugerville, TX

[8]Hull York Medical School, University Rd, Heslington, York YO10 5DD, UK

[9]Federal University of São Paulo, R. Sena Madureira, 1500 - Vila Clementino, São Paulo - SP, 04021-001, Brazil

[10]Georgia Dermatology Partners, (Formerly, Gwinnett Dermatology, PC), 2383 Pate St., N, Snellville, GA 30078

[11]Unité Thérapie Cellulaire et Génique, Faculté de Médecine de Nantes, CHU Nantes - Place Alexis Ricordeau, 44093 Cedex 01, France

*Corresponding author: Brigitte Dréno; email: brigitte.dreno@atlanmed.fr; tel: +33 2 40 08 31 18

Supplementary Table 1 Patient characteristics

	Total sample	18 to 24 years	25 to 45 years	46 to 55 years	P value*
n	723 (100%)	92 (12.7%)	519 (71.8%)	112 (15.5%)	
Demographics					
Age (year), mean (SEM)	35.1 (0.64)	21.75 (0.26)	34.15 (0.08)	50.28 (0.24)	
Sex, n (%)					0.299
Male	350 (48.4%)	39 (42.7%)	252 (48.5%)	59 (52.3%)	
Female	373 (51.6%)	52 (57.3%)	267 (51.4%)	54 (47.7%)	
Country of residence, n (%)					0.006
USA	258 (35.7%)	42 (45.3%)	161 (31.1%)	55 (49.0%)	
Canada	27 (3.7%)	3 (3.2%)	20 (3.8%)	4 (3.9%)	
Brazil	297 (41.1%)	31 (33.8%)	244 (47.0%)	22 (19.8%)	
EU (Germany, France, Italy)	141 (19.5%)	16 (17.7%)	94 (18.1%)	31 (27.2%)	
Type of residence, n (%)					0.002
Urban	477 (66.0%)	52 (57.2%)	375 (72.4%)	49 (43.8%)	
Suburban	178 (24.7%)	32 (34.6%)	106 (20.4%)	41 (36.3%)	
Rural	67 (9.3%)	7 (8.2%)	38 (7.2%)	22 (19.9%)	

Employment status				0.004
Employed	501 (69.3%)	48 (52.7%)	380 (73.2%)	73 (64.9%)
Self-employed	99 (13.7%)	1 (1.2%)	74 (14.2%)	24 (21.3%)
On sick leave	1 (0%)	0	0	0
Unemployed	56 (7.7%)	13 (14.3%)	37 (7.1%)	6 (5.3%)
Retired	8 (1.1.7%)	0	4 (1.0%)	5 (4.1%)
Student/Pupil	38 (5.2%)	27 (29.7%)	10 (2.0%)	0
Other	20 (2.8%)	2 (2.1%)	13 (2.5%)	5 (4.5%)
Education level				0.0027
Undergraduate	366 (50.6%)	67 (73.7%)	233 (44.9%)	65 (58.3%)
Graduate	348 (48.1%)	24 (25.8%)	280 (53.9%)	45 (39.7%)
Other	9 (1.2%)	0	6 (1.2%)	2 (2.0%)
Clinical information				
Fitzpatrick scale				0.278
Light, pale white skin (Fitzpatrick I)	32 (4.4%)	3 (3.6%)	18 (3.4%)	10 (9.4%)
White, fair skin (Fitzpatrick II)	101 (14.0%)	7 (8.1%)	74 (14.2%)	20 (18.1%)
Medium, white to olive skin (Fitzpatrick III)	198 (27.4%)	29 (31.8%)	136 (26.2%)	33 (29.2%)

Brown skin, typical Mediterranean Caucasian skin, or Asian background/Latin, Central, or South American background (Fitzpatrick IV)	187 (25.8%)	18 (20.0%)	135 (26.0%)	34 (30.0%)	
Dark brown skin; Mid-eastern skin types (Fitzpatrick V)	170 (23.5%)	26 (28.8%)	131 (25.1%)	13 (11.6%)	
Black, very dark brown to black/Black skin (Fitzpatrick VI)	35 (4.9%)	7 (7.8%)	26 (5.0%)	2 (1.7%)	
Family history of acne scars, Yes, n (%)	481 (66.6%)	64 (69.7%)	345 (66.4%)	72 (64.5%)	0.734
Age at facial acne onset (year), mean (SEM)	14.2 (0.24)	13.02 (0.51)	14.35 (0.26)	14.58 (0.66)	0.277
Facial acne duration (year), mean (SEM)	10 (0.32)	5.47 (0.45)	9.99 (0.23)	14.01 (0.91)	
Ever treated for facial acne, Yes, n (%)	516 (71.3%)	64 (69.7%)	377 (72.6%)	75 (66.9%)	0.373
Facial acne treatment delay (year), mean (SEM)	2.33 (0.18)	2.76 (0.46)	2.35 (0.13)	1.84 (0.25)	0.106
Current facial acne scar severity, n (%)					0.105
Mild	228 (31.6%)	32 (35.3%)	169 (32.5%)	27 (24.0%)	
Moderate	359 (49.6%)	47 (51.8%)	262 (50.4%)	50 (44.2%)	
Severe/very severe	136 (18.8%)	12 (12.9%)	89 (17.1%)	36 (31.8%)	
Type of atrophic scars, n (%)					
Ice pick scars	599 (82.8%)	85 (92.8%)	439 (84.6%)	75 (66.4%)	0.064
Boxcar scars	162 (22.4%)	8 (8.9%)	109 (21.0%)	45 (39.8%)	0.042

Rolling scars	53 (7.4%)	3 (3.8%)	36 (6.9%)	14 (12.8%)	0.044
Duration of facial acne scars (year), mean (SEM)	15.66 (0.35)	4.69 (0.12)	14.74 (0.47)	31.16 (0.44)	0.0001
Age at the onset of facial acne scars (year), mean (SEM)	19.07 (0.45)	16.99 (0.41)	19.40 (0.53)	19.23 (0.66)	0.0001
Acne scar treatment received, Yes, n (%)	226 (31.2%)	29 (31.6%)	180 (34.6%)	17 (15.2%)	0.006
Acne scar treatment delay, year, mean (SEM)	2.00 (0.26)	0.65 (0.08)	2.05 (0.16)	3.37 (1.91)	0.151

*P value for comparison across age groups

Supplementary Table 2 Odds ratios for a score in the range of 'very large' impact of facial acne scars on HRQOL (per DLQI) in crude and adjusted logistic regression models, with age, sex, residential background and country of residence, acne scar severity grade, type of skin, education, and employment status as explanatory variables
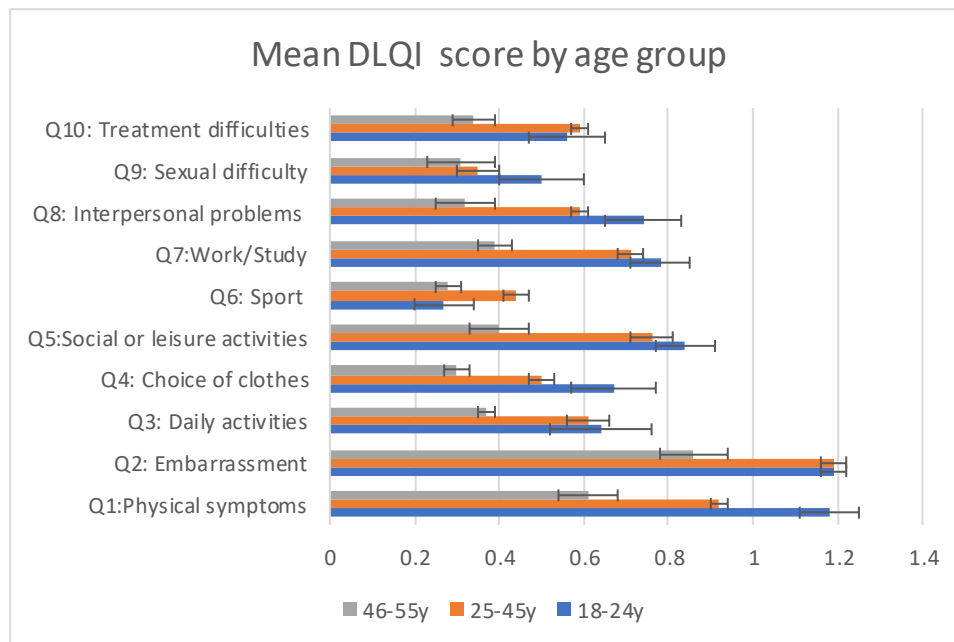
Explanatory variables	Crude OR	Crude 95% CI	Crude P value	Adjusted OR	Adjusted 95% CI	Adjusted P value
Sex						
Male	ref			ref		
Female	0.90	0.67 to 1.20	0.383	0.86	0.66 to 1.10	0.174
Age group (year)						
18-24	ref			ref		
25-45	0.80	0.37 to 1.72	0.493	0.51	0.19 to 1.36	0.138
46-55	0.35	0.19 to 0.62	0.006	0.20	0.13 to 0.30	0.0001
Type of residence						
Urban	ref			ref		
Suburban	0.54	0.44 to 0.65	0.0001	0.59	0.33 to 1.04	0.062
Rural	0.63	0.29 to 1.41	0.205	0.75	0.23 to 2.43	0.563
Work situation						
Active	ref			ref		
Inactive	0.34	0.16 to 0.72	0.014	0.31	0.10 to 0.91	0.039
Education						
Undergraduate	ref			ref		
Graduate	1.40	1.01 to 1.93	0.045	1.30	1.08 to 1.57	0.016
Fitzpatrick scale						
Type I – Light, pale white & Type II – White, fair	ref	ref		ref		
Type III – Medium, white to olive	1.41	0.61 to 3.23	0.336	1.34	0.61 to 2.94	0.387

Type IV – Olive, moderate brown	0.97	0.32 to 2.95	0.947	0.83	0.38 to 1.84	0.576
Type V – Brown, dark brown	1.60	1.07 to 2.37	0.029	1.38	1.03 to 1.84	0.035
Type VI – Black, very dark brown to black	3.73	2.54 to 5.47	0.0001	2.76	1.71 to 4.45	0.003
Acne scar severity						
Mild	ref			ref		
Moderate	1.05	0.78 to 1.42	0.688	1.10	0.87 to 1.38	0.346
Severe/very severe	2.15	1.63 to 2.84	0.001	2.59	2.00 to 3.36	0.0001

*Country of residence was also included in the adjusted analyses.

Supplementary Fig 1 Mean DLQI scores for each questionnaire item (Q1-Q10). Mean DLQI scores based on age groups (a) and sex (b).

(a) Each question is scored from a minimum of 0 (i.e., no impact on HRQOL) to a maximum of 3 (i.e., very strong impact on HRQOL); Q: DLQI questionnaire item number; P values for the comparison of DLQI scores across age groups for adjusted analyses including age, sex, residential background and country of residence, acne scar severity grade, type of skin, education, and employment status are as follows: Q1=0.001; Q2=0.007; Q3=0.008; Q4=0.011; Q5=0.002; Q6=0.419: Q7=0.001; Q8=0.006; Q9=0.097; Q10=0.014.

(b) Each question is scored from a minimum of 0 (i.e., no impact on HRQOL) to a maximum of 3 (i.e., very strong impact on HRQOL); Q: DLQI questionnaire item number; P values for the DLQI score comparison between male and female subjects for adjusted analyses including age, sex, residential background and country of residence, acne scar severity grade, type of skin, education, and employment status are as follows: Q1=0.002; Q2=0.004; Q3=0.284; Q4=0.141; Q5=0.441; Q6=0.177: Q7=0.532; Q8=0.075; Q9=0.143; Q10=0.383.

Mean DLQI score by gender