Quality of life in adults with keloid scars

Calidad de vida en adultos con cicatrices queloides

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Abstract

Introduction: Keloid scars affect up to 16% of the Hispanic population and may cause deterioration in the quality of life. Most of the previous studies have focused on patients with hypertrophic scars secondary to burns. **Objective:** To determine the quality of life in adults with keloid scars that go to a dermatological center. **Methods:** An analytical cross-sectional study was carried out at Centro Dermatológico Dr. Ladislao de la Pascua in adults with a diagnosis of keloid scars. The quality of life was measured using the Dermatology Life Quality Index (DLQI) and the following clinical variables were studied: age, sex, evolution time, scar size, number of scars and affected topography. The Beck questionnaire for depression was also applied. **Results:** 106 adults with keloid scars were recruited, 61% men and 39% women, with a median age of 26 years (interquartile range: ± 18 years). The average score of the DLQI was 5.58 (standard deviation [SD]: ± 5.528), with a maximum obtained of 22 points, this score is interpreted as a minimum or small deterioration of the quality of life. The dimension that contributed most to the total score was symptoms and feelings, with 50.36%. The number of scars and age were directly associated with the DLQI score. The average score obtained with the Beck questionnaire was: 6.45 (SD: ± 6.46 points) and it correlates with the DLQI score. **Conclusions:** Keloid scars have a minimal negative effect on the quality of life of young adults. This effect was associated with the self-report of depressive symptoms; however, the results of this study do not allow to attribute a causal relationship. It is recommended to apply the quality of life questionnaire in young adults with scars.

KEY WORDS: Keloid scar. Scar. Cicatrix. Quality of life. Adults.

Resumen

Introducción: Las cicatrices queloides afectan hasta el 16% de la población hispana y pueden causar un deterioro en la calidad de vida. La mayoría de los estudios previos han estudiado pacientes con cicatrices hipertróficas secundarias a quemaduras. **Objetivo:** Determinar la calidad de vida en adultos con cicatrices queloides que acuden a un centro dermatológico. **Método:** Se realizó un estudio transversal analítico en el Centro Dermatológico Dr. Ladislao de la Pascua, en adultos con diagnóstico de cicatrices queloides. Se midió la calidad de vida mediante el instrumento DLQI (Dermatology Life Quality Index) y se estudiaron las siguientes variables clínicas: edad, sexo, tiempo de evolución, tamaño de la cicatriz, número de cicatrices y topografía afectada. Se aplicó el cuestionario de Beck para el tamizaje de la depresión. **Resultados:** Se reclutaron 106 adultos con cicatrices queloides (61% hombres y 39% mujeres), con una mediana de edad de 26 años (rango intercuartilar: ± 18 años). El puntaje promedio del DLQI fue de 5.58 (desviación estándar [DE]: ± 5.528), con un máximo obtenido de 22 puntos; dicho puntaje se interpreta como un deterioro mínimo de la calidad de vida. La dimensión que más contribuyó al total del puntaje fue la de síntomas y sentimientos, con el 50.36%. El número de cicatrices y la edad se asociaron directamente con el puntaje del DLQI. El puntaje promedio obtenido con el cuestionario de Beck fue de 6.45 (DE: ± 6.46 puntos) y se co-

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relacionó con el puntaje del DLQI. **Conclusiones:** Las cicatrices queloides tienen un efecto negativo mínimo en la calidad de vida. Dicho efecto se asoció al autorreporte de síntomas depresivos; sin embargo, los resultados de este estudio no permiten atribuirle una relación casual. Se recomienda aplicar el cuestionario de calidad de vida en adultos jóvenes con cicatrices.

PALABRAS CLAVE: Cicatriz queloide. Cicatriz. Calidad de vida. Adultos.

Introduction

Keloid scarring is an alteration in wound repair characterized by connective tissue exaggerated synthesis in response to trauma, burns, inflammatory processes and surgical incisions. Its incidence ranges from 4.5 to 16%, it predominates in people of African descent and Hispanics, and it occurs at between 10 and 30 years of age¹. It is associated with HLA B14, B21, BW16, BW35, DR5 and DQW3, and with blood type A Rh⁺². Autosomal dominant and autosomal recessive inheritance has been reported in familiar cases².

Keloid scars, or keloids, develop mainly in the earlobes, the area of the chin, the trunk and shoulders. Diagnosis is clinical and should be differentiated from hypertrophic scar, since this remains confined to the limits of the wound, while keloid scars go beyond them and invade normal dermis³. Due to its evolution, hypertrophic scarring appears within the first 4 weeks after the wound and undergoes spontaneous regression, in contrast to keloid scarring, which occurs later and proliferates indefinitely³.

Skin is important in terms of body image, and any disease affecting it can cause a deterioration in patient quality of life. Quality of life measurement in patients with skin pathologies can be accomplished using generic instruments that provide a global idea of quality of life, or with the specific instruments as the Dermatology Life Quality Index (DLQI)⁴.

Recently, a study conducted in patients with keloid scars found that pain and itching are associated with a decrease in quality of life, mainly regarding emotional and mental well-being. Said quality of life decrease was correlated with age, scar visibility, number of scars, lack of elasticity and scar surface irregularity⁵. Quality of life has also been documented to improve as soon as the size of the scar is decreased by treatment⁶.

Thus far, there are no works in our population on the quality of life of adults with keloid scars, and thus the main purpose of this study was to determine the quality of life in patients who developed keloid scars and who attended a skin disease reference center for treatment. As a secondary objective, the prevalence of

depression was determined using a self-administered screening instrument, with its correlation with quality of life being established.

Method

A cross-sectional study was conducted in adults diagnosed with keloid scars who attended the *Centro Dermatológico Dr. Ladislao de la Pascua* in the period from March 2016 to January 2017. The protocol was approved by the Research Ethics Committee of the institution and all patients signed an informed consent in case they accepted to participate. The inclusion criteria were being older than 18 years, clinical diagnosis of keloid scar and treatment of scars being the chief complaint. Patients with any visual or motor disability that prevented them from answering the study questionnaires, as well as those who were illiterate, were excluded.

One dermatologist verified the keloid scar clinical diagnosis and documented the following variables about scars: size, topography, evolution time, previous treatments and medical care received. After history taking, the patients independently answered the DLQI and Beck's depression inventory. The DLQI is a one-dimensional scale that consists of a 10-question questionnaire, which include the following dimensions: 1) symptoms and feelings; 2) daily activities; 3) leisure; 4) work and school life; 5) personal relationships, including sexuality; and 6) treatment side-effects⁴. The DLQI is calculated by adding the scores for each question, resulting in a minimum of 0 and a maximum of 30⁴; high scores are correlated with quality of life deterioration. Beck's depression inventory⁷ consists of 21 multiple-choice questions with a minimum score of 0 and a maximum score of 63. The higher the score, the higher the probability of having depression; a score of 1 to 10 is considered normal. This inventory is an instrument that includes the major criteria for depression diagnosis and is useful to identify patients requiring psychiatric care.

The sample size was calculated according to the DLQI average reported by Reinholz et al.⁸ in adults with keloids of 6.06 (standard deviation [SD]: 4.0)

points, with the formula being used to calculate a population mean with an alpha value of 0.01 and 1-point accuracy. Data were analyzed with the SPSS program, v.19. Qualitative variables were reported as proportions and quantitative variables with normal distribution by means of average and standard deviation; otherwise, the median and interquartile range were reported. The statistical tests used were the chi-square test, Student's t-test and Pearson's correlation, with a p-value < 0.05 being considered statistically significant.

Results

One-hundred and six adults diagnosed with keloid scars were recruited, 61% (n = 65) were males and 39% (n = 41) females, with a median age of 26 years (interquartile range: $\pm$ 18 years). Average time elapsed since onset of the disease until diagnosis was two years (interquartile range: $\pm$ 4 years). At first medical appointment for the scars, 80.2% of patients had been previously seen by a doctor, in 52.94% of cases by a dermatologist. Fifty-nine patients (55.7%) had received some kind of prior treatment, with the most widely used being intralesional steroids (24.5% of patients), followed by silicone gel (14.2%).

The etiology of the scars was: 41.5% acne, 17.9% surgery, 17% trauma, 7.5% wounds, 6.6% chicken pox, 5.7% piercings, 1.9% folliculitis and 1.9% immunizations. Most common topography was the trunk in 60.4% of cases, followed by the upper limbs with 16%; the rest of localizations are described in detail in table 1.

Fifty-one scars (48.1%) were found in visible areas, with 32.1% of the patients having only one scar and the remaining 67.9% having multiple, with the median being 3 scars (interquartile range: $\pm$ 6), with a maximum of 40 per patient. With regard to the size of the scars, average length was 3.5 cm (SD: 2.54 cm), width 1.55 cm (SD: 1.27 cm) and height 2.75 mm (SD: 1.73 mm).

Quality of life analysis

Average DLQI score was 5.58 (SD: 5.58), with a maximum score of 22 points; said score is interpreted as minimal or slight quality of life deterioration. The dimension that contributed the most to total score was symptoms and feelings, with 50.36%, followed by daily activities with 17.94% and leisure with 12.95%. Average score obtained for each dimension, the items assessed and their contribution to total score are

Table 1. Topography of the scars (n=106)

Topography	Frequency	%
Trunk	64	60.4
Upper limb	17	16.0
Earlobe	11	10.4
Scalp	6	5.7
Chin region	3	2.8
Chin and trunk	2	1.9
Neck	1	0.9
Lower limb	1	0.9
Neck and trunk	1	0.9

Table 2. Quality of life per DLQI dimension

Dimension	Items	Mean Score (SD)	Percentage of total
Symptoms and feelings	1-2	1.98 (1.48)	50.36
Daily activities	3-4	1.27 (1.55)	17.94
Leisure	5-6	1.01 (1.47)	12.95
Work and school life	7	0.42 (0.63)	08.40
Personal relationships	8-9	0.63 (1.32)	07.59
Treatment side effects	10	0.25 (0.74)	02.86

shown in table 2. The distribution of all 106 patients according to the DLQI score, or quality of life degree of deterioration, is presented in figure 1.

When the DLQI score was analyzed according to age, no correlation was found between both variables ($r = -0.12$, $p = 0.23$). The situation was similar with evolution time ($r = -0.125$; $p = 0.20$). When the DLQI scores were compared according to patient gender, no statistically significant difference was found ($t = 1.201$; $p = 0.233$). Neither was a correlation found between the DLQI score and the size ($r = -0.123$; $p = 0.209$) or number of scars ($r = 0.172$; $p = 0.079$), nor were there differences in visibility ($r = 0.09$; $p = 0.361$), i.e., whether they were in the head or neck in comparison with other topographies.

When the characteristics of patients who obtained a DLQI high score (> 11 points, which means a significant impact on quality of life) were compared with those of subjects who had scores of 0 and 1 (no impact on quality of life), the number of scars and age were found to be directly associated with the score. No statistically significant difference was observed in the remaining analyzed variables, as shown in table 3.

Figure 1. Patient distribution by degree of quality of life involvement.

Quality of life and depression analysis

Average score obtained with Beck's questionnaire was 6.45 (SD: 6.46 points). Patient distribution according to Beck's questionnaire percentage results can be observed in figure 2. When the DLQI scores were compared according to the degree of patient depression, the higher the DLQI score, the greater the depression symptoms observed to be reported by the patient ($F = 5.88$; $p = 0.0001$), as shown in table 4.

Discussion

In our study, patients obtained a quality of life average score of 5.58 (SD: 5.528), a value that is similar to that reported by Chuan and Goh⁹ (5.62 ± 4.3). According to the results, the deterioration of quality of life of our patients with keloid scars is observed to be minimal, just as in other pathologies such as psoriasis, vitiligo, rosacea, acne and atopic dermatitis. The quality of life domain that was most affected was symptoms and feelings, which corresponded to 50.36% of DLQI questionnaire total score, which is consistent with the results previously published by Reinholz et al.⁸ for this type of patients. This quality of life deterioration is attributable to the impact keloid scars have on patient psychological sphere, which, according to our results, is not associated with an important deterioration in the daily activities, leisure, work or school life, personal relationships and treatment side-effects domains.

When the characteristics of our sample were contrasted and classified into two groups, no quality of life deterioration and important deterioration (0-1 points and > 11 points, respectively), we found that

Table 3. Quality of life-associated variables

Variable	DLQI score 0-1 Mean (SD)	DLQI score >11 Mean (SD)	p
Number of scars	3.24 (3.76)	9.9 (11.73)	0.020
Age	31.24 (13.36)	25.24 (7.48)	0.049
Volume (mm ³)	206.3 (330.1)	148.01 (217.81)	0.484
Evolution time	3.65 (6.07)	2.61 (5.47)	0.538
Visibility	48.3%	57.14%	0.536
Female gender	34.48%	52.38%	0.206

Table 4. Degree of depression according to Beck's questionnaire and quality of life

Level of depression	Ranges	DLQI Score Mean (SD)	p
No ups and downs	0	3.16 (3.06)	*
Normal ups and downs	1-10	4.83 (4.71)	0.075
Slight mood disturbance	11-16	9.14 (6.66)	0.006
Intermittent depression	17-20	8.83 (3.86)	0.001
Moderate depression	21-30	13.67 (11.93)	0.002
Severe depression	31-40	0	-
Extreme depression	> 40	0	-

patients with quality of life deterioration had a lower average age (25.2 vs. 31.2 years) and a larger average number of scars (9.9 vs. 3.24). These findings are consistent with the results obtained by Bock et al.¹⁰ and Balci et al.¹¹ in their studies. In addition, although a larger proportion of scars in visible areas were observed in the group of patients with significant quality of life deterioration (57.14% vs. 48.3%) in comparison with the group that had their quality of life unaffected, no statistically significant difference was demonstrated. This finding contrasts with those reported by Brown et al.¹² and by Lawrence, et al.¹³, who refer having found higher quality of life deterioration in patients with scars in visible areas, such as the face. An explanation that supports our findings is that scars on areas covered by clothes are important for sexual intimacy, just as scars on the face are for the image the individual projects in his/her daily life.

The concept of quality of life is based on knowing the perception the individual has of his/her position in life and the context of his/her lifestyle, housing, satisfaction at school and work, as well as the economic situation he/she is found in. This concept includes health in the biological, psychological and social

Figure 2. Patient distribution according to Beck's questionnaire.

spheres. Therefore, quality of life perception will depend on the system of values, standards or perspectives of each individual¹⁴⁻¹⁶. In this context, most patients with scars seek treatment both to ameliorate the symptoms of pain, itching and mobility restriction and to reverse the cosmetic alteration generated by scars¹⁷. It is a fact that keloid scars-attributable quality of life deterioration is comparable to that experienced by patients with other skin conditions, such as psoriasis¹¹. Brown et al.¹² identified five quality of life affected areas in patients with different types of scars: physical comfort and functioning, acceptability by oneself and by others, social functioning, trust in nature, disease management and emotional stability. In their study, the majority of patients were not satisfied with the appearance of the scars due to their stigma and perceived psychological associations. However, our study demonstrates that the quality of life deterioration attributable to keloid scars was minimal in our patient sample, which is representative of adults attending the dermatologist. Is important to note that we did not include patients with hypertrophic scars or scars associated with burns, which can be larger and cause greater cosmetic alteration when they develop in areas such as the face and neck.

Finally, when we analyzed Beck's questionnaire results for the detection of depressive traits, we found that patients reporting symptoms consistent with moderate depression had an average quality of life deterioration that was qualified as highly significant. These results could be interpreted in two ways: the first one is that the quality of life construct (by unquestionably reflecting the degree of psychological well-being) will always be correlated with the prevalence of psychiatric disorders, while the second one is that there is

really an association between the presence of keloid scars and the deterioration of the psychological state of well-being of the individual who suffers from them. Therefore, studies are required to investigate whether this type of scars secondarily cause a psychological alteration, or if quality of life deterioration is solely attributable to the psychiatric pathology present in the individual.

The limitations of the study, which should be explored in another type of studies with other methodological design, included not having asked about other triggering factors of the depressive symptoms the patients manifested and that potentially would be confounding factors for an association between the development of keloid scars and depression to be proposed.

Our study demonstrates that keloid scars have a significant negative effect on young adults' quality of life, which is similar to that reported in other dermatological diseases.

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Conflicts of interest

None.

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