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Assessment of Impairment of Quality of Life in Patients of Keloid and Hypertrophic Scars and Correlation with Clinical Severity: A Cross Sectional Study

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Abstract

Background

Being a unique disease to human beings, cosmetic disfigurement due to Keloids and Hypertrophic scars, has been a prevalent complaint associated with this overgrowth phenomena of skin.

Aims and Objectives

This study aims to help overcome the paucity of data by assessing the impact on quality of life in Indian subjects of keloids and HTS (using DLQI) and its correlation with clinical severity (using VSS).

Materials and Methods

Prospective, descriptive analysis of 110 patients over 36 month period, with patients between 18-70 years of age, clinically diagnosed with keloids and HTS, ruling out study participants with active site infection, pregnant/lactating or those not willing to consent to study.

Results

With average age of 30.88 years, study was male predominant(65%) with over 75% of total population study having normal skin type. Mean duration of scar stabilisation was 0.88 years in 89 of those subjects, with most common site being the chest followed by right forearm. 88% of participants complained of itching as the predominant complaint. Mean DLQI of 10.62 was witnessed in this study

Conclusion

In this study there was moderate to very large effect on quality of life was observed among keloid and hypertrophic scar patients. Treating dermatologist should stress over psychiatric counselling to patient along with on-going treatment.

Keywords

Keloid, Hypertrophic scar, DLQI, VSS

Introduction

Keloids and Hypertrophic scars (HTS), are dermal fibro-proliferative disorders, occurring post trauma, surgical procedures, burns or spontaneously. Keloid occurs due to increased deposition of collagen and glycosaminoglycan around a wound, HTSare due to increased tension but do not spread beyond the wound.(1)

The sedulous and unhindered growth of keloid and HTS can result in cosmetic disfigurement, affecting their quality of life due to functional impairment.(1,2)

This study helps overcome the paucity of data by assessing the impact on quality of life in Indian subjects of keloids and HTS (using DLQI) and its correlation with clinical severity (using VSS).

Materials & Methods

A. Study Population and Design

This prospective study was carried over a period of 3 years after institutional ethical clearance and informed consent from the participants who were clinically diagnosed cases of keloid or hypertrophic scar within the age group of 18-17 years without any active infection at the scar sight.

The eventual importance regarding this study was explained to all subjects and prior to their actual participation into the study, informed written consent was taken.

Based on the selection criteria patient a detailed history will be recorded with particular emphasis on the site of involvement, duration, location, number of scars etc. and reported in the form of questionnaire from the patients enrolled in the study.

The QoL will be assessed with the help of a pre-validated and modified questionnaire based on the "Dermatological Life Quality Index" (DLQI) proposed by Finley and Kahn.(3)There are 10 questions in the questionnaire each having 4 response options graded from 0 to 3 (0 being no effect, 1-minimal effect, 2-moderate effect, 3-severe effect) Thus, a maximum score of 3 and a minimum score of 0 will be accorded to each question thereby permitting a maximum and a minimum score of 30 and 0 respectively, for the modified DLQI score. Scars will be assessed based on Vancouver Scar Scale (VSS) which measures variables like pliability, height/thickness, vascularity and pigmentation.

B. Statistical Analysis

Quantitative data are presented as means ± standard deviations (SD), Qualitative data are presented as frequencies. Data was analyzed using Microsoft Excel, SPSS software and Med Calc statistical software version 12.1.1 software**.** The Chi-square test with Yates' correction was used to compare categorical variables; the unpaired *t* test was used to compare normally distributed continuous variables between

groups. Spearman's rank correlation coefficient was used to evaluate the relationship between DLQI and other variables. A value of two tailed $P < 0.05$ was considered significant.

Results

In 110 subjects, mean age of study sample was 30.88 years (SD - 11.72), with the highest 70 years and lowest 18 years. There were 72 (65%) males and 38 (35%) females, 55 (44%) samples were from 21-30 years age group.

82 (75%) subjects were having normal skin type, while 16 (14%) with oily and remaining 12 (11%) with dry skin type.

61 (55.5%) subjects were taking treatment out of which 2 subjects feel that treatment given was effective and 19 (17.3%) subject reported recurrence. Hypertension and diabetes mellitus was present as comorbid condition in 7 subjects.

64 (58.2%) subjects having single scar over body, Mean age of onset of scar was 24.62 years (SD - 12.34); with mean duration since scar was 4.7 years (SD - 6.43).

Chest (52) was most common scar site followed by right forearm (13). Upper limb and lower limb were common sites along with face; scalp, ear, breast etc. were also involved in some subjects. 94 (85.5%) subject were having scar beyond wound, while 80 (73%) subjects were having stable scar.

Out of 97 subjects those having itching; 40 were having moderate itching while 32 with mild itching, Pain (51) and movement restriction (16). 53 (48.2%) subjects were having hyper pigmented type of scar followed by 32 (29.1%) with normal skin colour.

Trauma (48) was most common cause of scar among study subjects followed by idiopathic conditions (22). Acne, burns as underlying etiology in 7 subjects each.

Mean DLQI of study sample was 10.62 score (SD - 5.15) and Mean VSS was 8.01 (SD - 2.24).

48 (44%) subjects having very large effect on quality of life (11-20 score) followed by 41 (37%) subjects with moderate effect on quality of life (6-10 score). 2 (2%)subject were having extremely large effect on patients quality of life.

VSS shows highly positive correlation with DLQI (p=0.00). It means as VSS increases there was increase in DLQI.

There was no significant difference between mean DLQI and VSS score among those with comorbid conditions like DM, HTN with those without it ($p > 0.05$).

There was no significant difference between mean DLQI and VSS score among both sexes ($p > 0.05$), while there was significant association was found between presences of pain making very large effect or extreme large effect on patient's life. (Pearson Chi-Square 28.153 & p 0.00001) and no association found between genders over severity of DLQI. (Pearson Chi-Square 0.8376 & p 0.3601)

A. Demographics

Keloid and Hypertrophic scar are slightly common in males (65%) than in females (35%).Mean age of study sample was 30.88 years with standard deviation of 11.72 years, with the highest 70 years and lowest 18 years. 55 (44%) samples were from 21-30 years age group followed by 22 (35%) subjects in 31-40 years age group.82 (75%) subjects were having normal skin type, while 16 (14%) with oily and remaining 12 (11%) with dry skin type.9 (8.2%) subjects were having family history of similar scar. 61 (55.5%) subjects were taking treatment for scar out of which 2 subjects feel

that treatment given was effective. 19 (17.3%) subject reported recurrence of scar following treatment. 3 subjects having hypertension and diabetes mellitus each as co-morbid conditions, while 1 subject was having both these two condition. Out of 110 subjects, 64 (58.2%) subjects.

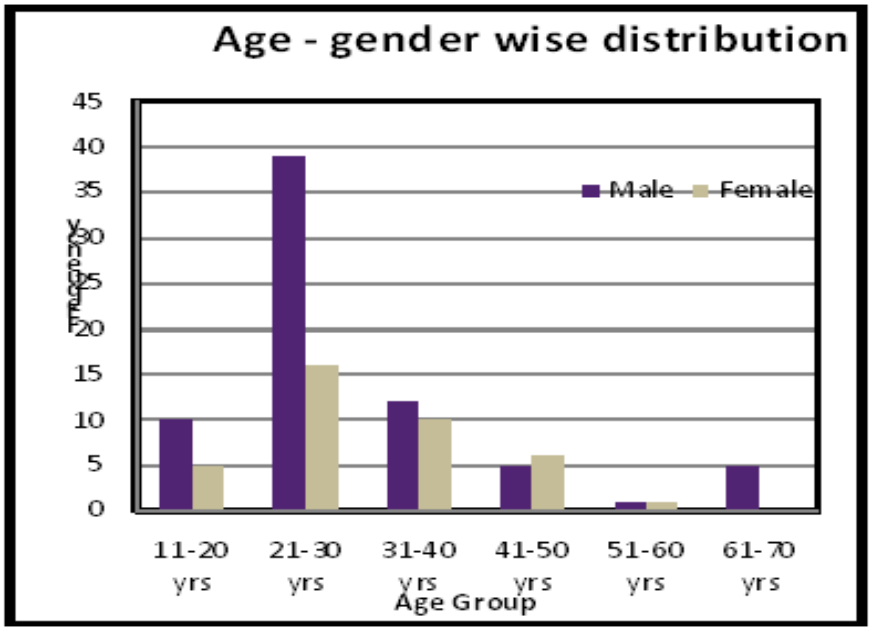


Fig1.. Examination of Keloid

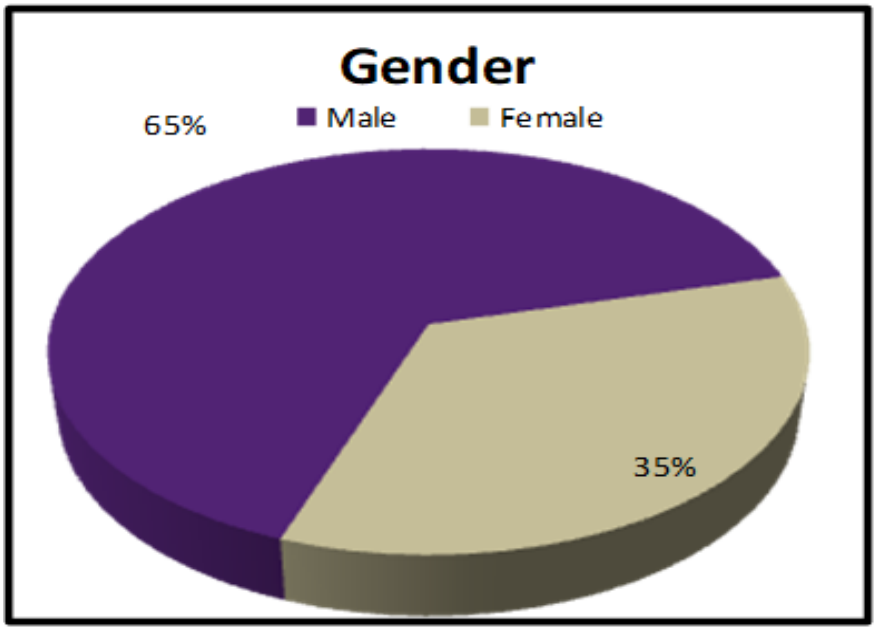


Fig 2. Age and Gender wise distribution of study sample

Where having single scar over body followed by 19 (17.3%) with two scars, while remaining were having more than two scars. Mean age of onset was 24.62 years (SD – 12.34); with mean duration since scar was 4.7 years (SD – 6.43). Mean duration for scar stabilization was 0.88 years (SD – 0.96 years) in 89 subjects.

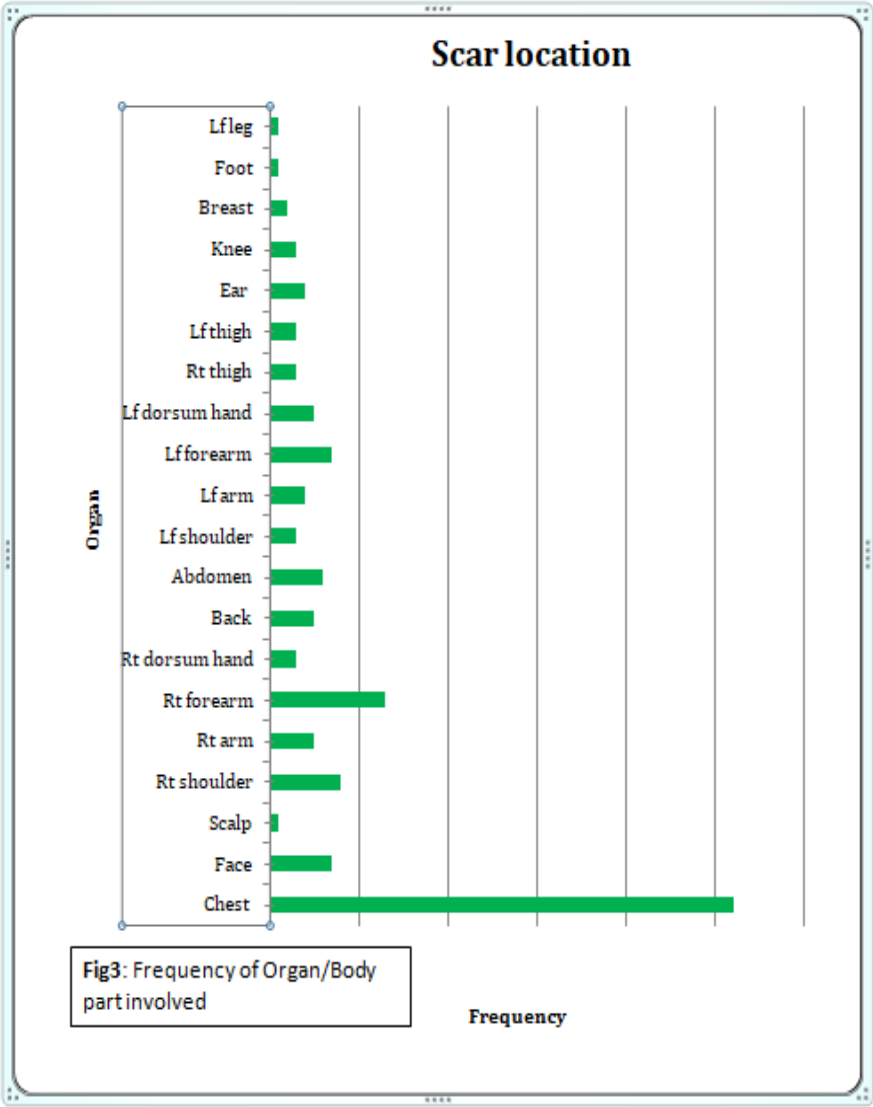


Fig3: Frequency of Organ/Body part involved

Above bar diagram chest (52) was most common site of scar followed by right forearm (13) among study samples. Upper limb and lower limb were common sites along with face; scalp, ear, breast etc. were also involved in some subjects. Some subjects were having more than one scar which present at other location over the body. 94 (85.5%) subject were having scar beyond wound, while remaining within wound limit. 80 (73%) subjects were having stable scar followed by 21 (19%) evolving and 9 (8%) on remission.

Clinical Features of Scar

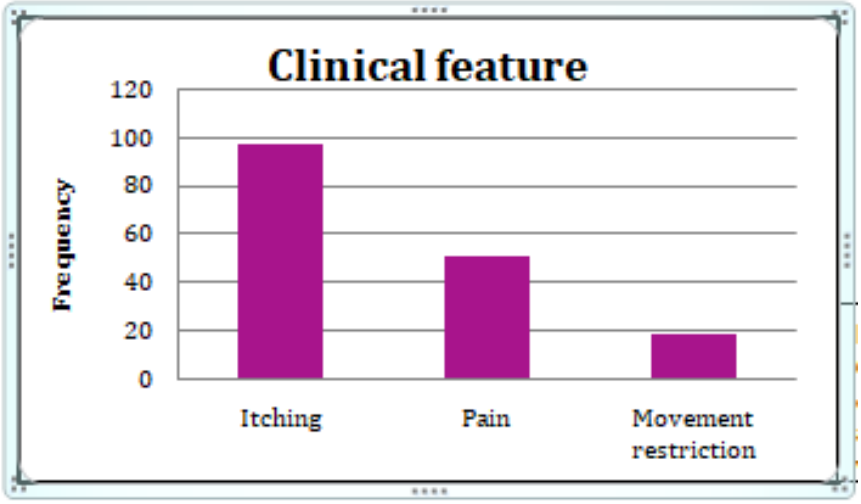


Fig 4: Clinical complaints associated with scar

Above bar diagram shows that, itching (97) at scar site was most common complaint among study sample. Out of 97, 40 were having moderate itching while 32 with mild itching at scar site. Pain at scar site was present in 51 subjects while movement restriction due to scar was observed in 16 subjects. Some subjects were having more than one complaint.

79 (72%) subjects were having scar over visible part of body while in 31 (28%) it can be covered by cloths or non-visible sites. Spontaneous reduction of scar was observed in 11 (10%) of subjects.

53 (48.2%) subjects were having hyper pigmented type of scar followed by 32 (29.1%) with normal skin colour. 19 (17.3%) were having hypo pigmented scar while 6 (5.5%) were having both hyper as well as hypo pigmentation.

Above bar diagram shows that, trauma (48) was most common cause of scar among study subjects followed by idiopathic conditions (22). Acne, burns as underlying etiology in 7 subjects each. Post causes of scar like post procedure (18), chicken pox (5), vaccine induced (1) were also present.

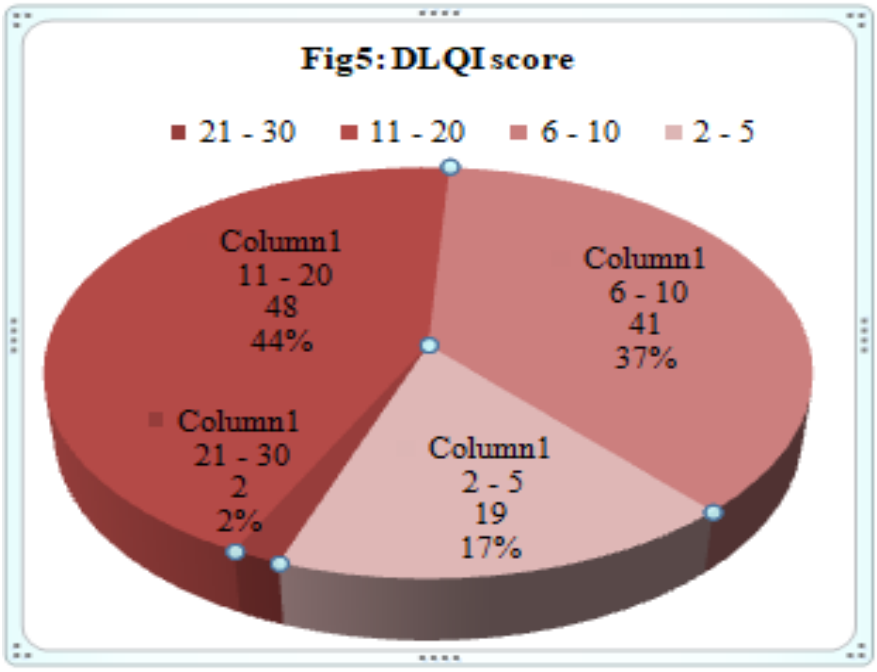
Dermatology Life Quality Index (DLQI)

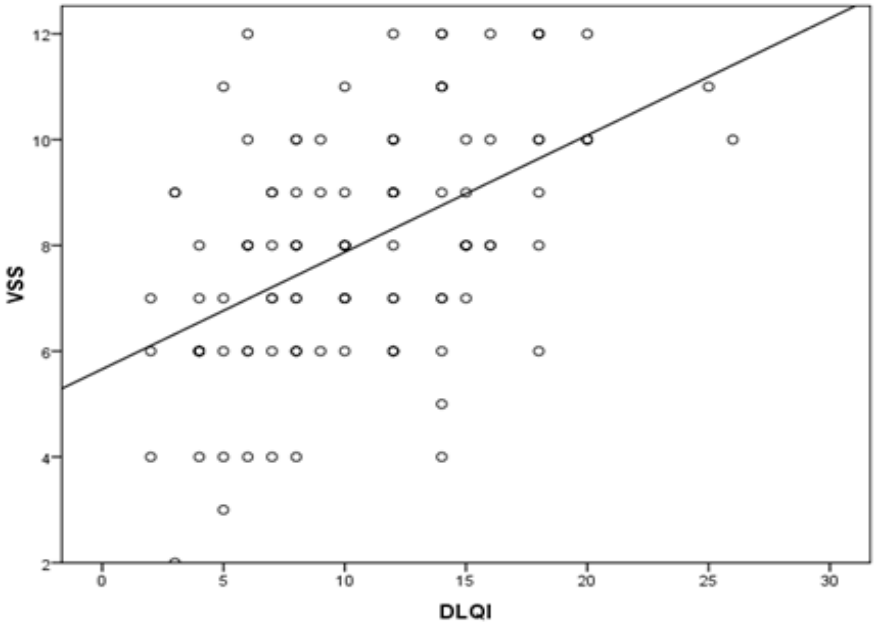
Mean dermatology life quality index (DLQI) of study sample was 10.62 score with standard deviation of 5.15, with the highest 26 score and lowest 2 score.

Table 1. DLQI vs. VSS of study sample

Statistics	DLQI	VSS
N	110	110
Mean	10.62	8.01
Std. Error of Mean	.491	.214
Std. Deviation	5.154	2.244
Range	24	10
Minimum	2	2
Maximum	26	12

Mean Vancouver Scar Scale (VSS) of study sample was 8.01 with standard deviation of 2.24, with the highest 12 and lowest 2.

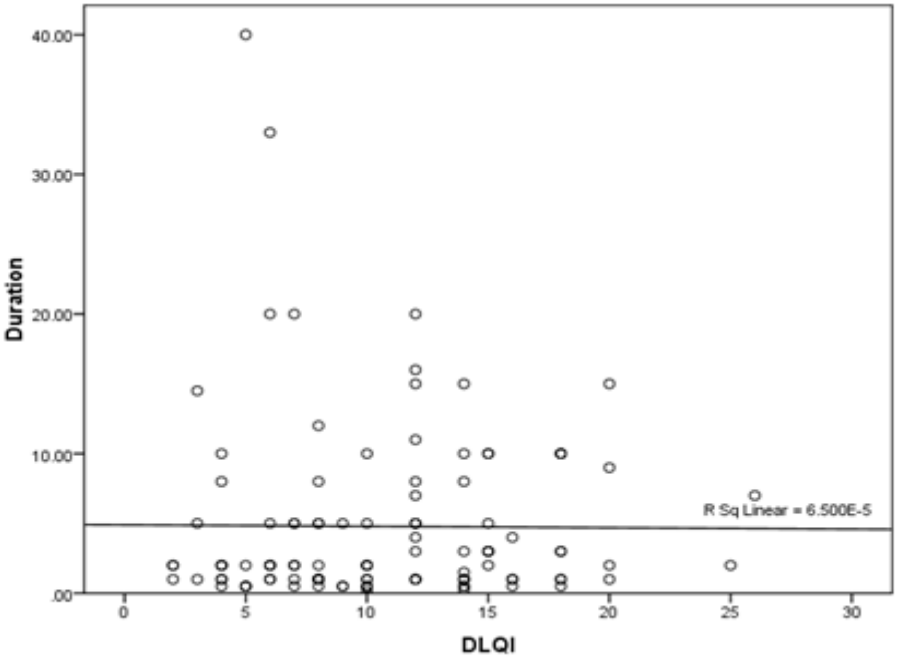




Parameter	Spearman correlation	p value
VSS with DLQI	.496**	0.00

***Fig 6**. Spearman correlation of VSS with DLQI

On application of Spearman correlation, VSS shows highly positive correlation with DLQI (p=0.00). It means as VSS increases there was increase in DLQI.



Parameter	Spearman correlation	p value
Duration since scar with DLQI	-0.008	0.933

***Fig 7**. Spearmann correlation of Duration since scar with DLQI

On application of Spearman correlation, duration of scar since present (years) shows weak negative correlation with DLQI which was statistically not significant (p= 0.933).

Unpaired Samples Statistics						
Variable	Other illness	Mean	N	Std. Deviation	Std. Error Mean	P value

Table 2. DLQI vs VSS Unpaired Statistics and Comorbidities

DLQI	Yes	11.43	7	4.577	1.730	0.669
	No	10.56	103	5.207	.513	
VSS	Yes	8.57	7	1.618	.612	0.496
	No	7.97	103	2.281	.225	

On application of unpaired t test, there was no significant difference between mean DLQI and VSS score among those with comorbid conditions like DM, HTN with those without it ($p > 0.05$). It means presence of comorbid conditions like DM, HTN won't affect DLQI and VSS score.

Table 3. DLQI vs VSS Unpaired Statistics and Gender

Unpaired Samples Statistics						
Variable	Gender	Mean	N	Std. Deviation	Std. Error Mean	P value
DLQI	M	10.50	72	4.965	.585	0.742
	F	10.84	38	5.558	.902	
VSS	M	7.85	72	2.127	.251	0.300
	F	8.32	38	2.451	.398	

On application of unpaired t test, there was no significant difference between mean DLQI and VSS score among both sexes. ($p > 0.05$)

Table 4. Chi-Square DLQI and Pain

DLQI / Pain	Up to moderate effect on DLQI	Very large effect or more on DLQI	Total
Yes	14	37	51
No	46	13	59
Total	60	50	110

On application chi square test, there was significant association was found between presences of pain making very large effect or extreme large effect on patient's life. (Pearson Chi-Square 28.153 & p 0.00001)

Table 5. Chi-square DLQI in Gender

DLQI / Gender	Up to moderate effect on DLQI	Very large effect or more on DLQI	Total
Male	37	35	72
Female	23	15	38
Total	60	50	110

On application chi square test, no association found between genders over severity of DLQI. (Pearson Chi-Square 0.8376 & p 0.3601)

Discussion

In this study mean age of study sample was 30.88 years (SD - 11.72), with 72 (65%) males, similarly in Martha A et al(4) there was 61% were males with sample having 26 years as the median age and mean age of 27 years (SD - 17) in Walliczek U et al(5) which suggest middle age men were more involved by keloid or hypertrophic scar.

Earlier literature on keloid scar subjects has illustrated that pain and itching are two commonly reported symptoms that affect quality of life. Itching (97) at scar site was most common complaint among this study sample followed by pain at scar site among 51 subjects. As per Bijlard E et al(6)low mental and emotional HRQ related with painful and itchy keloids, while it was similarly Bock O et al(7) correlated it with physical impairment. Kouwenberg CA et al(8) itching and pain were considered Itching and pain as strongest predictors for health related quality of life.

There was negative correlation between duration since scar was present with DLQI in this study which was statistically non-significant ($r = -0.008$, $p > 0.05$), similarly Seo HM et al(9) found no association between them.

There was no association (Pearson Chi-Square 0.8376 & p 0.3601) or significant difference in DLQI between both the sexes (Mean DLQI M = 10.50, F = 10.84, P = 0.743) among subjects in this study, similar observation was made by Thompson A(10) and Wylie K(11)studied disfigurement adjustments such as burns or dermatological conditions.

The mean DLQI score did not differ significantly among those with comorbid conditions like Diabetes Mellitus (DM), Hypertension (HTN) with those without it ($p > 0.05$) in this study, it might be due to presence of scar in life long chronic comorbidities like DM, HTN among subjects have reduced the attention towards scar or its effects over quality of life in comparison with actual burden of comorbidities over quality of life.

Characteristics of scar like height, pliability, vascularity and pigmentation etc. was taken into consideration in Vancouver Scar Scale was first introduced in 1990 and later has been validated. On application of Spearman correlation, VSS shows highly positive correlation with DLQI (r=0.496, p=0.00) in this study. It means as VSS increases there was increase in DLQI. Similarly highly

significant positive correlation with approximately similar correlation coefficient was observed by Seo HM et al (r=0.372, p=0.040).(9)

Impact over quality of life among study subject was assessed using dermatological life quality index (DLQI), Mean dermatology life quality index (DLQI) of 110 study sample in this study was 10.62 score with standard deviation of 5.15, with the highest 26 score and lowest 2 score. 48 (44%) subjects having significant effect on quality of life (11-20 score) followed by 41 (37%) subjects with minimal effect (6-10 score).

Table 6. DLQI across various studies

Study	Mean DLQI (SD)
Balci DD et al(12)	7.79 (5.10)
Reinholz M et al (13) (Keloid, HTS)	6.06 (4.00), 2.53 (2.48)
Seo HM et al(9)	5.48 (6.23)
Martha A et al(4)	5.58 (5.528)

Mean DLQI in this study was comparatively higher than Balci DD et al(12)Reinholz M et al(13)Seo HM et al(9)and Martha A et al.(4) This suggest emotional and social wellbeing of patient were markedly lowered due to disfigurement because of scar.

People usually believe skin as a sign of prettiness and it boosts individuals' self-esteem & personality. The stigmatization due to skin conditions is a huge problem within our society, and being noticeably different can leads pressure and often propagates psychological hitches, which can disturb social activities, relationships and overall quality of life. Unluckily, there is often no better or expected results from treatment, which can lead to awkwardness or humiliation and there is need to reduce the stigma of patients. Psychosomatic variables (fulfillment with looks, embarrassment from sickness and distress experienced) and physical (itching, paint & movement limitations) correlated with quality of life.

Hence, it should be understood that specialist should not treat peculiarities of condition but should accept complete management including physical and psychological problems described by keloid patient. The current study offers the necessity of a multidisciplinary method includes dermatologist, plastic surgeon, psychologists and physiotherapists.

The importance of the complete approach for keloid patients is crucial to endorse health by following principled and integrative model, World Health Organization (WHO) suggested similar prospective(14)

Conclusion

In this study there was oderate to very large effect on quality of life was observed among keloid and hypertrophic scar patients. Middle aged men was mostly affected as trauma over chest was major etiological factor, itching and pain were main predictors of quality of life among patients. There was positive correlation between scar assessments by Vancouver scar scale with quality of life of patient. Patient having

scar are experiencing poor quality of life which affects their overall sense of wellbeing. Treating dermatologist should stress over psychiatric counseling to patient along with on-going treatment.

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