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Original Research Article

Study of Various Treatment Modalities for Patients with Keloid : A Comparative Approach

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Abstract

Background: Keloid is a thick raised scar. It can occur wherever having a skin injury but usually forms on earlobes, shoulders, cheeks or the chest. Treatment of keloids is challenging for all clinicians; no standard treatment protocol exits. Though triamcinolone has been used as gold standard since 1980's, its efficacy is high in initial doses ranging from 50% to 90%, but recent data suggests nearly 10% to 50% of keloids tend to relapse with triamcinolone (TAC) after initial good response.

Aim and Objectives: This study aimed to compare various existing and newer treatment modalities and tried to find out one ideal treatment at low cost with effectiveness and with no recurrence.

Material and Methods: It was Prospective randomized open labelled clinical trial, Patients presenting with keloid to the department of DVL in our medical college, during the study period of December 2021 to April 2022 were recruited those who were fulfilled inclusion and exclusion criteria.

Results: Study comprised of 60 patients each of 20 in group 1, 2 and 3 respectively. Group 1 and 3 were more or less equally efficacious with clearance rate. 77.83% (13) of the patients had shown complete response by 18 weeks in our study in group 1. In group 2, 30% (6 out of 20) of the patients showed complete response. In group 3, 65% (13) of the patients showed complete response by 18 weeks and the median response time was found to be 12 weeks in our study.

Conclusion: Prevalence of keloids was found to be equal among both sexes. The majority of keloids were seen in the 20 to 40 years, the chest was most common site observed. Among the treatment modalities Group 1 and Group 3 treatment modalities was found equally effective in our study.

Keywords: Keloids**,** Triamcinolone, Skin injury.

Introduction

A keloid, or keloid scar, is a kind of overgrown scar, or an overly aggressive healing response to a wound. It is a thick raised scar. It can occur wherever having a skin injury but usually forms on earlobes, shoulders, cheeks or the chest. If anyone prone to developing keloids, he or she might get them in more than one place. Keloid growth might be triggered by any sort of skin injury, an insect bite, acne, an injection, body piercing, burns, hair removal, and even minor scratches and bumps. Sometimes keloids form for no obvious reason.

Keloids are most common in people with brown or Black skin, it is more likely to develop a keloid between the ages of 20 and 30. Keloids can also develop after you get a body piercing, a tattoo, or have surgery. Keloids sometimes show up 3 months or more after your skin is injured. Some continue to grow for years. [1,2]

"Treatment of keloids is challenging for all clinicians; no standard treatment protocol exits. Though triamcinolone has been used as gold standard since 1980's, its efficacy is high in initial doses ranging from 50% to 90%, but recent data suggests nearly 10% to 50% of keloids tend to relapse with triamcinolone (TAC) after initial good response." [3] Keloids and hypertrophic scars are two well-known types of excessive pathologic scarring. These types differ by aesthetics, pathogenesis, histopathology, and treatment, although there are overlapping characteristics. Compared to hypertrophic scars, keloids are characterized as more clinically severe in nature, causing pruritus and pain more frequently in patients.

Though keloid is essentially a benign entity but it may rarely become complicated with secondary bacterial infections, ulceration, development of malignant melanoma and basal cell carcinoma. Management of keloids has been a frustrating experience both for the treating doctors and patients. Adding to the woes, recurrent nature of keloid makes the matters worse. A number of options have been tried either alone or in various combinations with variable success. [4]

Though there are various treatment available for keloids but not one is ideal for this treatment. Therefore, this study was undertaken to compare various existing and newer treatment modalities and tried to find out one ideal treatment at low cost with effectiveness and with no recurrence

Materials and Method:

It was Prospective randomized open labelled clinical trial, Patients presenting with keloid to the department of DVL of our medical college, during the study period of December 2021 to April 2022 were recruited those who were fulfilled inclusion and exclusion criteria. A diagnosis of keloid was made on clinical grounds and biopsy.

Inclusion Criteria:

1. Age group 10- 60 years.
2. Both sexes.
3. Size of keloid between 1- 15 cm
4. Duration of less than 15 years.

Exclusion Criteria:

1. Pregnancy
2. Lactation
3. Heart disease.
4. Liver and kidney disease
5. Immunocompromised patients
6. H/O previous treatment

Methodology:

A thorough history with regard to the onset of the lesion and whether it was spontaneous or followed acne, folliculitis, insect bite, varicella, trauma, surgery was taken to assess the etiology of the disease. The duration, progression of lesion, associated symptoms, family history were also asked for. The patients were also enquired about past history of thyroid disease and drug intake (retinoids, anabolic steroids) prior to the onset of the lesions.

A meticulous general and systemic

examination was performed to look for associations. Complete dermatological examination was carried out. The site, number, size, consistency, colour of the lesions were noted. Care was taken to look for associated skin lesions.

Patients were allocated to each of three groups by simple randomization. Clinical assessment of the scars was performed at the beginning of the study, and at every three weeks interval after starting treatment. The drugs were administered till the scars flattened or for a maximum period of 18 weeks whichever was earlier. Patients allocations were done as follows

Group 1: 20 patients comprising the first group were treated with injection Triamcinolone acetonide 40mg/ml, with a 27-gauge needle attached to an insulin syringe. 0.2 ml was injected in each site ($1cm^2$), so as to cause blanching. The patients were given injections at 3 weeks interval, till the flattening of the scar or for a maximum period of 18 weeks.

Group 2: 20 patients comprising the second group were treated with injection 5- Fluorouracil 50mg/ml with a 27-gauge needle attached to an insulin syringe. 0.2ml was given at each site ($1cm^2$), sequentially by multiple puncture technique so as to cover the entire lesion. The injections were given at intervals of 2 weeks till the flattening of the scar or a maximum period of 18 weeks.

Group 3: 20 patients comprising the fourth group were treated with intralesional injection of 0.9ml of 5- Fluorouracil (50mg/ml) combined with 0.1ml of injection Triamcinolone (40mg/ml). 0.2ml of the combination was injected in each site ($1cm^2$) sequentially with multiple puncture technique. The injections were given at intervals of 3 weeks till the lesions flatten or for a maximum of 18 weeks.

Statistical Analysis: Collected data was entered in Microsoft Excel 2016 for further analysis. Qualitative data was expressed with frequency and percentage and Quantitative data was expressed in terms of mean. Chi-square test/ fister exact test was used to see association between the variables and ANOVA was applied to check mean difference between the variables. P-value<0.05 was considered as statistical significance. Data were analysed with the help of statistical software SPSS version 25

Observation and Results :

There were total three groups undertaken for the study, Group 1, Group 2 and Group 3, there were 20 patients in each group.

There were 28 males and 32 females in our study group. The ages of the patients ranged between 10 to 60 years. The majority of the males were in the 20 to 30 years age group, and the females were most common in the 30 to 40 years age group

43 patients had spontaneous onset of keloids. A history of trauma prior to the onset of the lesions was obtained in 9 patients. 5 patients had acne as the preceding lesion. 2 of them had keloids developing at the site of previous surgical scar. Keloid occurred at the site of tattoo in a single patient.

The sites of involvement in the descending order of frequency was found to be chest (34), shoulder (13), forearm (9), arm (3), (1),neck (1). As shown in Table 1.

Table 1: Basic Characteristics of Study population.

Variable	Group I	Group 2	Group 3	P-value
Age Group				
10-20 YEARS	4	4	6	0.96
21-30 YEARS	6	7	6	
31- 40 YEARS	7	7	5	
41-50 YEARS	2	1	2	

51-60 YEARS	1	1	1	
Gender				
Male	12	9	7	0.280
Female	8	11	13	
Etiology				
SPONTANEOUS	12	16	15	0.762
TRAUMA	4	2	3	
ACNE VULGARIS	2	2	1	
SURGERY	0	1	1	
TATOO	0	1	0	
Site of Involvement				
CHEST	10	11	13	0.236
SHOULDER	6	4	3	
FOREARM	3	1	5	
ARM	0	0	3	
NECK	1	0	0	

Table 2: Basic Characteristics of Keloid among groups.

Variable	Group I	Group 2	Group 3	P-value
Duration of Keloid				
≤ 1 YEAR	6	3	3	0.512
2- 4YEARS	10	11	8	
≥ 5 YEARS	4	7	8	
Number of Keloid				
Single	15	9	7	0.286
Multiple	10	7	12	
Size of the Keloid				
≤5CM	13	10	10	0.838
>5CM	9	10	8	

The duration of the lesions ranged between 1 to 10 years in our study group. 16 patients had lesions of ≤ 1 year duration. Majority (29) had lesions of 2 to 4 years duration.19 patients had keloids ≥ 5 years duration.

Table 3: Mean values distribution of parameters in follow up among groups.

Parameters		0 Week	3 Weeks	6 Weeks	9 Weeks	12 Weeks	15 Weeks	18 Weeks
Pigmentation	Group 1	2.88	2.56	1.98	1.62	1.33	1.09	0.92
	Group 2	2.86	2.71	2.42	2.3	2.15	2.07	1.92
	Group 3	2.76	2.71	2.64	2.12	1.85	1.42	1.21
Pliability	Group 1	3.1	2.91	2.56	1.94	1.44	1.05	0.62
	Group 2	3.05	2.98	2.47	2.02	1.72	1.49	1.23
	Group 3	2.94	2.72	2.56	1.99	1.42	0.64	0.58
Height	Group 1	2.86	2.31	2.09	1.76	1.26	0.82	0.41
	Group 2	2.45	2.26	2.19	2.08	1.83	1.76	1.49
	Group 3	2.68	2.62	2.46	1.92	1.42	0.85	0.54

Discussion:

Keloids are elevated fibrous scars that extend beyond the borders of the original

wound, do not regress, and usually recur after excision. The term is coined from the Greek word cheloides, meaning "crab's claw". Hypertrophic scars are similar, but are confined to the wound borders and usually regress over time.

In Group 1 in our study, we have found that there was a significant change in pigmentation by the 6th week and 15% (3) of the patients showed complete response by 18 weeks. The therapeutic response in each parameter has been assessed. The study done by Margaret Shanthi et al [5] showed a significant reduction in pigmentation by the 3rdweek. Also, significant change in pliability by 6th week was observed in our study. The study conducted by Manuskiatti et al [6] showed a significant change in pliability by 8 weeks and the study by Margaret Shanthi et al [5] had shown a significant change in pliability as early as 3 weeks. The median response time was found to be 6 weeks in the study conducted by Margaret Shanthi et al when compared to our study where it was found to be 12 weeks. 75% (15) of the patients had shown complete response by 18 weeks in our study.

The study conducted by Darougheh A et al [7] has shown that only 20% of the patients showed complete flattening by 12 weeks. Layton AM and Yip J et al [8] had shown complete response in 85% of the patients, in concordance with our study. 77.83% (13) of the patients had shown complete flattening by 18 weeks in our study. The study conducted by Manuskiatti et al [6] showed significant flattening by the 8th week, which is in concordance with our study where significant flattening was achieved by the 9th week. The median response time in the study conducted by Margaret Shanthi et al [5] was found to be 6 weeks, when compared to our study where it was 12 weeks. The variation of the results in our study may be attributed to the fact that patients with family history of keloids, keloids of more than 5 years duration, size more than 10 cm were not included in the study conducted by Margaret Shanthi et al. [5] And it has been shown by previous studies that keloids of longer duration had delayed response to treatment.

In Group 2 none of them showed complete response with regard to pigmentation. A significant change in pigmentation was observed by the 9th week. None of the patients showed complete response by the endof 18 weeks also. The study done by Manuskiatti[91] et al showed a significant reduction in pliability by 16 weeks when compared to our study where it was found to be 6 weeks. 4 out of 15 patients (26.67%) showed complete response in our study.

Manuskiatti et al had shown a significant reduction in height by 8 weeks when compared to our study where it was achieved by 15 weeks. This may be due to the fact that weekly injections were given in the study in contrast to our study where the patients were treated with injections at 2 weeks interval. The study of Wu XL et al [9] showed complete flattening in 45.71% of the patients, when compared to our study where 30% (6 out of 20) of the patients showed complete response. This may be due to the fact that in that study biweekly injections of the drug were given.

In Group 3 in our study, 3 patients showed complete response in terms of pigmentation by the end of the study period. A significant change in pigmentation was noted by the 6th week. 15% of the patients showed complete response by 18 weeks.

The study conducted by Manuskiatti et al [6] has shown a significant change in pliability by 8 weeks when compared to our study where it was seen by 3 weeks. This may be due to the fact that a lower concentration of Triamcinolone (20mg/ml) was used by them and the time interval between the doses was increased to 4 weeks in the last two treatments. 65% (13) of the patients showed complete response by 18 weeks and the median response time was found to be 12 weeks in our study.

The study of Asilian, Darougheh et al [7] showed complete response in 55% of the

patients when compared to our study where 65% (13) of the patients had achieved complete flattening. The study by Manuskiatti et al [6] showed a significant change in height by 8 weeks when compared to our study where it was seen by 6 weeks. This may be due to the lower concentration of Triamcinolone used in their study and also the less frequent dosing of once in 4 weeks for the last two treatments. The median response time was found to be 12 weeks in our study.

It has been observed that 77.83% of the patients treated with intralesional Triamcinolone acetonide alone and 65% of the patients treated with a combination of 5 – Flourouracil and Triamcinolone acetonide had shown complete flattening by 18 weeks. It has been observed that steroids increase b- FGF and decrease TGF- β [10].They also decrease the levels of IL- 1,6 which are known to be involved in keloid pathogenesis [11]. The number of mast cells and the release of histamine by mast cells is also decreased by steroids. But these factors are not altered by the use of 5- fluorouracil alone. This might have had an influence on the treatment response in our study as it is observed that the use of Triamcinolone alone or its combination with 5-Flourouracil produced better response compared to the use of 5 – fluorouracil alone. [12]

Conclusion:

From above results and observation, we can conclude that in our study the prevalence of keloids was found to be equal among both sexes. The majority of keloids were seen in the 20 to 40 years, the chest was most common site observed. Among the treatment modalities Group 1 and Group 3 treatment modalities was found equally effective in our study.

Limitation :

Current study undergone through many limitations.

1. Major limitation of this study was that our patients could not be followed up for prolonged periods after completion of the treatment. to assess the rate of recurrence and we are of the view that intralesional radiofrequency may be an effective modality.
2. Our study sample size was very less to know better treatment modalities.
3. We have not discussed adverse effect of treatment modalities in our study to know about better treatment.

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