Original

A Comparative Study of Intralesional Triamcinolone versus Intralesional 5-Fluorouracil in the Treatment of Keloids in Sokoto, Nigeria

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Article history: Received 11 May 2025, Reviewed 12 June 2025, Accepted for publication 19 June 2025

Abstract

Background: Keloids are excessive scar tissue deposited within and beyond the boundaries of the wound. In addition to aesthetic problems, keloids can be painful, itchy, and psychologically debilitating, presenting a significant therapeutic challenge. The study compared the efficacy and side effects of intralesional triamcinolone acetonide versus intralesional 5-fluorouracil in treating keloids located on the head and neck.

Methods: This randomised prospective study, conducted between October 2020 and January 2022, involved patients with keloid scars on the head and neck. They were randomly assigned to receive either intralesional triamcinolone or 5-fluorouracil treatment over 14 weeks. Scar assessment was performed using the Patient and Observer Scar Assessment Scale and scar dimension measurements. Data were analysed using the Statistical Package for Social Science, version 25.0 (Armonk, NY: IBM Corp.). Changes in the scar scores and dimensions were compared between the groups using the independent t-test.

Results: Eighty-four patients with 90 keloid scars participated in the study. The mean age of the patients was 27.70 years (± 7.19 years), with a male-to-female ratio of 1:2.2. There were no statistically significant differences in the baseline POSAS and keloid dimensions between the groups. However, there were statistically significant differences in the changes of the Overall POSAS (*p*-value 0.03), POSAS Patient scale (*p*-value 0.03), height reduction (*p*-value <0.05), and length reduction (*p*-value 0.03) in favour of the triamcinolone group.

Conclusion: The study demonstrates that intralesional triamcinolone acetonide is more effective than intralesional 5-fluorouracil in treating keloid scars.

Keywords: Keloid; Triamcinolone acetonide; 5-Fluorouracil; Patient and Observer Scar Assessment Scale, Scar dimensions.

How to cite this article

Alasi MA, Ibrahim MH, Legbo JN. A Comparative Study of Intralesional Triamcinolone versus Intralesional 5-Fluorouracil in the Treatment of Keloids in Sokoto, Nigeria. The Nigerian Health Journal 2025; 25(2): 838 – 847.
https://doi.org/10.71637/tnhj.v25i2.1101

Introduction

Keloids, despite being a common skin condition, pose significant challenges for effective treatment.[1] These scars extend beyond the boundaries of the original wound and invade adjacent healthy tissues, rarely showing regression over time.[2–4] In addition to causing aesthetic problems, keloids can be painful, itchy, and psychologically distressing for patients [1,3,4]

Keloids are often multiple and are commonly found in exposed areas, which can lead to embarrassment.[1] Hence, it is crucial for patients with keloids to have access to effective treatments to alleviate symptoms and improve their quality of life. Despite advances in wound healing and collagen metabolism, keloids have remained a therapeutic challenge.[5] Different treatment options exist, but there is no ideal solution, as these treatments are associated with varying recurrence rates and complications.[3,4,6]

Triamcinolone acetonide (TAC) is a commonly used corticosteroid that helps reduce excessive scarring by decreasing collagen synthesis, altering glucosaminoglycan synthesis and diminishing the production of inflammatory mediators and fibroblast proliferation during the healing process[7] On the other hand, 5-fluorouracil (5FU) is a fluorinated pyrimidine analogue known for its anti-metabolic properties. It irreversibly inhibits thymidylate synthase, blocking the conversion of uridine to thymidine and thereby inhibiting the synthesis of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA).[5,8] Additionally, it has been demonstrated that 5FU can induce fibroblast apoptosis without necrosis, and it also inhibits IGF-β signalling related to collagen type I production.[8]

Although TAC is the most frequently used long-acting corticosteroid for the intralesional treatment of keloids, its response rates are often low[9–11], and there is considerable risk of recurrence once treatment is stopped.[9,12–14] Furthermore, the complications arising from TAC treatment can be discouragingly high.[10] A review of existing literature indicates a paucity of information on the efficacy and safety of 5FU in our region, despite its proven effectiveness and safety in other areas.[15–17] This study thus compared the therapeutic efficacy and side effects of the more commonly used intralesional triamcinolone acetonide with those of intralesional 5-fluorouracil in treating keloids in the head and neck region.

Materials and Methods

Study Design and Setting

This was a randomized prospective study conducted at Usmanu Danfodiyo University Teaching Hospital, Sokoto State, Nigeria, between October 2020 and December 2021. Patients presenting at the outpatient clinic of the Plastic and Reconstructive Surgery unit with keloids in the head and neck region who met the inclusion criteria and provided consent were recruited for the study.

Inclusion and Exclusion Criteria

The study included patients aged 18 years and older with a clinical diagnosis of keloid on the head and neck that had lasted six months or more and were suitable for intralesional injection. The keloid scars had to measure 10cm or less in their widest diameter. Patients with two or more keloid scars that fulfilled these criteria were recruited into a single treatment group; however, the keloids were assessed separately in the final data analysis. Patients who sought surgical excision of their keloid scars or for whom the initial evaluation indicated that surgery would be part of a multimodal treatment plan were excluded. Additionally, pregnant or lactating women, those planning to become pregnant during the study period, and individuals with associated chronic diseases such as diabetes mellitus, hypertension, chronic liver disease, chronic kidney disease, and Human Immunodeficiency Virus (HIV) were excluded. Patients taking systemic steroids for other reasons, those with post-burn keloid, and those who received treatment for their keloid within six months before their presentation were not eligible. Furthermore, individuals who presented with ulcerated or suppurative keloids were excluded from the study as well.

Sampling Method and Randomization

Patients who met the eligibility criteria were recruited consecutively over the 15-month study period. A computer-generated random identification number was used to assign participants into two groups. Each consecutively recruited participant received an identification number, which determined their group assignment based on the randomization. Participants were randomized into two groups: the triamcinolone group, which received intralesional triamcinolone acetonide, and the 5-fluorouracil group, which received intralesional 5-fluorouracil.

Print ISSN: 0189-9287 Online ISSN: 2992-345X

Data Collection and Procedure

The data collected for the study included the demographic characteristics of the patients, relevant history and physical examination findings, scar assessment, and laboratory results. Side effects from each treatment were also documented. Clinical evaluation encompassed the duration of the keloid, location, size, multiplicity, family history, weight, height, and scar assessment using the POSAS. Laboratory investigations included complete blood count, liver function test, serum electrolytes, urea and creatinine, and fasting blood glucose. These tests were performed at enrolment and again at the end of the study for each participant.

The triamcinolone group received intralesional triamcinolone acetonide (KENALOG® by Bristol-Myers Squibb Srl, Italy) at 10 mg/ml. A total of 0.5 ml/cm^2 of the keloid was injected, with the delivery dose adjusted according to the size of the lesion, to a maximum of 4 ml per session. The 40 mg/ml concentration was diluted with 3 ml of 1% Xylocaine to achieve a 10 mg/ml concentration.

The 5-fluorouracil group was treated with 5-fluorouracil (Fluracil® by Biochem Pharmaceutical Industries Ltd, Mumbai) at 50 mg/ml. Similar to the TAC group, 0.5 ml/cm^2 of the keloid was injected, with the delivery dose adjusted based on the extent of the lesion, to a maximum of 3 ml per session, along with 0.5 ml of 1% Xylocaine. All injections were administered using a 23-gauge needle. When necessary, multiple injections were made 1 cm apart to ensure adequate medication distribution. Injections were given every two weeks in both groups, and each participant received a maximum of six doses.

Treatment Outcome Assessment

The clinical response of keloid scars to treatment was evaluated by measuring change in the Patient and Observer Scar Assessment Scale (POSAS) and assessing scar dimensions. For this study, the POSAS validated by Van de Kar et al.[18] was modified by removing the assessment of vascularity and pigmentation in the Observer scale. This modification was made because it was challenging to evaluate scar vascularity and pigmentation in dark-skinned participants recruited for the study. Importantly, this change did not significantly affect the study results, as it was consistently applied to all participants. To eliminate bias, the POSAS observer scale was assessed by a senior surgeon who was unaware of the treatment group to which the patient belonged. After thorough explanations, patients rated their scars using the Overall POSAS and Patient scale. The same surgeon also measured the dimensions of the keloid to the nearest centimetre using a digital Vernier calliper. The scar length was determined by measuring the longest axis of the scar, while the width was measured at a point perpendicular to the midpoint of the scar length. The height of the scar was measured at its highest point above the normal surrounding skin. All assessments were conducted during the initial recruitment into the study and again at the end of the study. Any side effects of the treatments reported by the patient or noted by the researchers were documented.

Follow-up visits

Patients attended the outpatient clinic for evaluation and injections. Clinic visits occurred every two weeks from enrolment until the last visit, which was four weeks after the final injection. During this last visit, post-treatment evaluations and measurements were conducted. Hence, the treatment period for each participant was 14 weeks.

Ethical Consideration

Ethical clearance for this study was granted by the hospital's Ethics and Research Committee (XXXXX/HREC/2018/No. 685). Patients willing to participate provided written consent by signing the Informed Consent Form. The study upheld the confidentiality of the collected data and protected patients' privacy per the Declaration of Helsinki.

Data Analysis

All collected data were entered into a computer and analysed using the Statistical Package for Social Science (SPSS), version 25.0. (Armonk, NY: IBM Corp). Frequency distribution and cross-tabulations were performed to examine relationships between qualitative variables. Changes in the Patient and Observer Scar Assessment Scale (POSAS) score and scar dimensions were compared within each group using the paired t-test and between the treatment groups using the independent t-test. Categorical variables were compared using the Chi-square and Fisher's exact test. Statistical significance was set at $p \leq 0.05$. Data are presented in simple tables and figures.

Print ISSN: 0189-9287 Online ISSN: 2992-345X

Results

Sociodemographic Characteristics

Eighty-four patients with 90 keloid scars were recruited into the study. Each treatment group consisted of 42 patients; however, the Triamcinolone Acetonide (TAC) group had 46 keloid scars, while the 5-fluorouracil (5FU) group had 44. In the TAC group, 4 patients (9.5%) had more than one keloid scar, while 2 patients (4.8%) had multiple keloid scars in the 5FU group. All enrolled patients completed the 14-week follow-up visits required by the study. The maximum number of keloid scars per patient was two. The study population included 26 males (31%) and 58 females (69%), resulting in a male-to-female ratio of 1:2.2. In the TAC group, there were 14 males (33.3%) and 28 females (66.7%) with a ratio of 1:2, while the 5FU group had 12 males (28.6%) and 30 females (71.4%) with a ratio of 1:2.5. The gender distribution between the two groups was not statistically significant, as shown in Table 1.

The mean age (± standard deviation, SD) of the patients in the study was 27.70 ± 7.19 years. The mean ages for the TAC and 5FU groups were 28.79 ± 7.48 years and 26.62 ± 6.81 years, respectively. There was no statistically significant difference in age between the two treatment groups (*p*-value = 0.17).

Table 1: Socio-demographic characteristics of study participants

Variables	TAC n (%)	5FU n (%)	*t*	*p*-value
Gender			0.22	0.81χ
Male	14 (33.3)	12 (28.6)		
Female	28 (66.7)	30 (71.4)		
Total	42 (100.0)	42 (100.0)		
Age (years)			1.39	0.17τ
Mean ± SD	28.79 ± 7.48	26.62 ± 6.81		
Occupation				0.98ρ
Unemployed	11 (26.2)	12 (28.6)		
Artisan	8 (19.0)	7 (16.7)		
Civil Servant	7 (16.7)	9 (21.4)		
Farming	4 (9.5)	4 (9.5)		
Self-employed	3 (7.1)	1 (2.4)		
Student	9 (21.4)	9 (21.4)		
Total	42(100.0)	42 (100.0)		

SD: Standard deviation. t: test statistic, the p-value was obtained using Chi-square χ, Independent t-test τ, Fisher's exact test ρ. Significant at $p < 0.05$

Clinical Presentation

The cheek and the earlobe were the most affected anatomical subunits, as demonstrated in Table 2. The mean duration of the keloid scars (± SD) was 10.96 ± 3.27 months, ranging from 6 to 24 months. The TAC group had a mean duration of 11.15 ± 3.36 months, while the 5FU group had 10.75 ± 3.20 months. There was no statistically significant difference in the duration of the keloids between the two groups (*p*-value = 0.56). In the study, six keloid scars (6.7%) were reported as painful, with three in the TAC group (6.5%) and three in the 5FU group (6.8%). Itch was present in 21 scars (23.3%), with 10 (21.7%) in the TAC group and 11 (25.0%) in the 5FU group. The differences in the presence of pain and itch between the two groups were statistically insignificant.

Table 2: Clinical presentation of study participants

Variables	TAC n (%)	5FU n (%)	t	*p*-value
Location of Keloid			0.43	0.96χ
Cheek	15 (32.6)	14 (31.8)		
Anterior neck	9 (19.6)	10 (22.7)		

Print ISSN: 0189-9287 Online ISSN: 2992-345X

Variables	TAC n (%)	5FU n (%)	t	*p*-value
Chin	6 (13.0)	7 (15.9)		
Earlobe	16 (34.8)	13 (29.5)		
Total	46 (100)	44 (100)		
Duration of keloid (Months)			0.58	0.56$^{\tau}$
Mean ± SD	11.15 ± 3.36	10.75 ± 3.20		
Pain			0.003	1.00$^{\rho}$
Present	3 (6.5)	3 (6.8)		
Absent	43 (93.5)	41 (93.2)		
Total	46 (100)	44 (100)		
Itch			0.13	0.81$^{\chi}$
Present	10 (21.7)	11 (25.0)		
Absent	36 (78.3)	33 (75.0)		
Total	46 (100.0)	44 (100.0)		

SD: Standard deviation. t: test statistic, the p-value was obtained using Chi-square $^{\chi}$, Independent t-test $^{\tau}$, Fisher's exact test $^{\rho}$. Significant at $p < 0.05$

Trauma was the most common identifiable cause of keloids in both treatment groups, primarily due to accidental lacerations and ear piercings. This was noted in 30 patients (65.2%) in the TAC group and 32 (72.7%) in the 5FU group. The causes of the keloids were comparable between the two groups (*p*-value = 0.81), as illustrated in Figure 1.

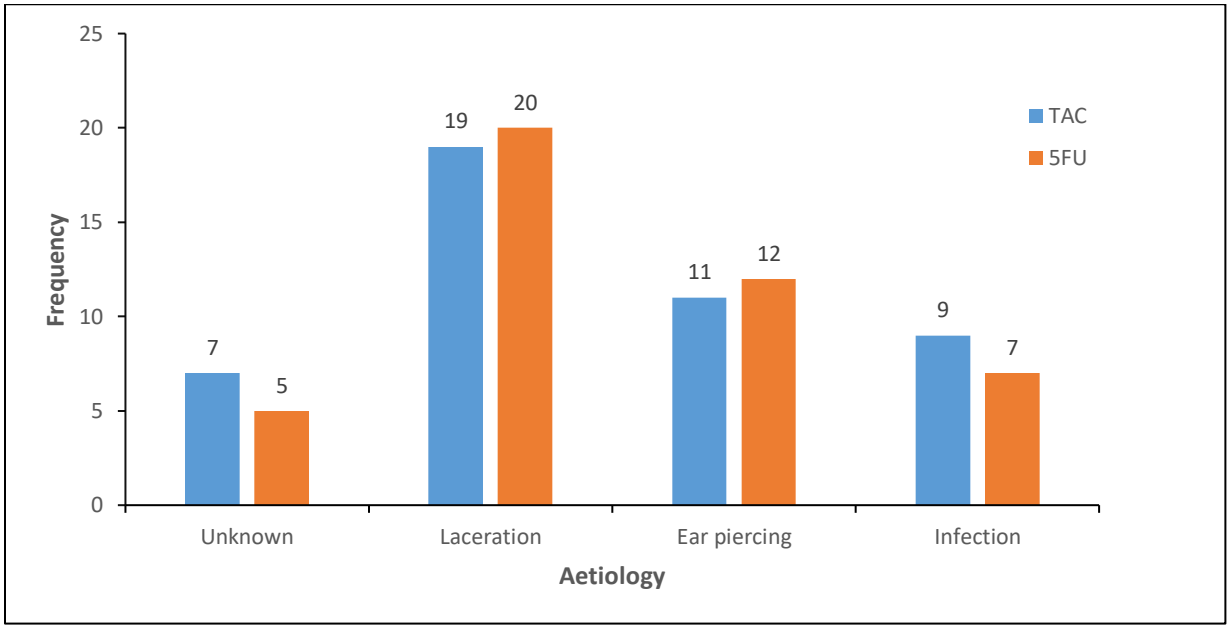

Figure 1: Comparison of the aetiology of keloid scars in the study

The rate of positive family history was 17.86%. Six patients (14.3%) had a family history in the TAC group, compared to nine patients (21.4%) in the 5FU group. This difference was statistically insignificant (*p*-value = 0.570). The primary reason patients sought care was cosmetic concerns (64.3%), followed by concerns regarding itching (21.4%) and increasing keloid size (23.8%).

Treatment Outcomes

Print ISSN: 0189-9287 Online ISSN: 2992-345X

A statistically significant difference was observed in the POSAS scores and the dimensions of keloids within each treatment group, as shown in Table 3. The Eta squared statistic for each measured parameter was more than 0.14, which indicates a large effect size. When comparing the two treatment groups (Table 4), the TAC group demonstrated a greater reduction in the mean overall POSAS and patient scale scores, with a statistically significant *p*-value of 0.03. However, the Eta squared statistic showed a small effect size. Additionally, the height (*p*-value <0.05) and length (*p*-value 0.03) of the keloids showed a statistically significant difference, with the TAC group exhibiting a greater mean reduction compared to the 5FU group. The magnitude of the differences in the mean height was medium (Eta squared = 0.11).

Table 3: Comparison of treatment outcomes within each group

Variables	M1 ± SD	M2 ± SD	M3 ± SD	t	Eta	*p*-value[ʊ]
TAC						
Patient Scale	45.02 ± 9.61	29.63 ± 8.19	15.39 ± 5.14	20.30	0.90	<0.05
Observer Scale	45.85 ± 8.85	29.09 ± 8.09	16.76 ± 7.73	14.71	0.83	<0.05
Overall POSAS	90.87 ± 14.23	58.72 ± 12.90	32.15 ± 10.73	20.33	0.90	<0.05
Volume (cm^3)	44.35 ± 54.99	15.65 ± 18.29	28.72 ± 40.21	4.84	0.34	<0.05
Length (cm)	4.87 ± 2.41	4.41 ± 2.30	0.46 ± 0.35	8.81	0.63	<0.05
Width (cm)	2.87 ± 1.58	2.41 ± 1.41	0.46 ± 0.36	8.67	0.63	<0.05
Height (cm)	2.05 ± 1.05	1.06 ± 0.53	0.99 ± 0.74	9.02	0.64	<0.05
5FU						
Patient Scale	42.11 ± 9.98	24.09 ± 7.47	18.02 ± 5.94	20.11	0.90	<0.05
Observer Scale	42.57 ± 7.65	23.57 ± 5.16	19.00 ± 5.88	21.43	0.91	<0.05
Overall POSAS	84.50 ± 14.60	47.66 ± 10.06	36.84 ± 9.56	25.57	0.94	<0.05
Volume (cm^3)	50.91 ± 57.73	16.27 ± 22.82	34.63 ± 37.54	6.12	0.47	<0.05
Length (cm)	4.68 ± 2.37	4.04 ± 2.23	0.64 ± 0.41	10.17	0.71	<0.05
Width (cm)	2.97 ± 1.20	2.35 ± 1.02	0.63 ± 0.42	9.81	0.69	<0.05
Height (cm)	2.59 ± 1.03	1.12 ± 0.73	1.46 ± 0.57	16.99	0.87	<0.05

M1: Mean of pre-treatment score/measurement M2: Mean of post-treatment score/measurement, M3: Difference in M1 and M2
SD: Standard deviation. t: test statistic Eta: Eta squared
The *p*-value was obtained using a Paired t-test [ʊ]. Significant at $p < 0.05$

Table 4: Comparison of treatment outcomes between the two groups

Variable	Mean ± SD		Mean Diff	t	Eta	*p*-value[τ]
	TAC(n=46)	5FU(n=44)				
Difference in Patient Scale	15.39 ± 5.14	18.02 ± 5.94	2.63	2.25	0.054	0.03
Difference in Observer Scale	16.76 ± 7.73	19.00 ± 5.88	2.24	1.54	0.026	0.13
Difference in Overall POSAS	32.15 ± 10.23	36.84 ± 9.56	4.69	2.19	0.052	0.03
Difference in Volume (cm^3)	28.72 ± 40.20	34.64 ± 37.54	5.92	0.72	0.006	0.47
Difference in Length (cm)	0.46 ± 0.35	0.64 ± 0.41	0.18	2.16	0.050	0.03
Difference in Width (cm)	0.46 ± 0.36	0.63 ± 0.42	0.17	2.02	0.044	0.05
Difference in Height (cm)	0.99 ± 0.74	1.46 ± 0.57	0.47	3.31	0.111	<0.05

SD: Standard deviation. Mean Diff: Mean Difference. t: test statistic. Eta: Eta squared.
The *p*-value was obtained using an Independent t-test [τ]. Significant at $p < 0.05$

Print ISSN: 0189-9287 Online ISSN: 2992-345X

Complications

The study recorded no systemic side effects attributable to either treatment agent. Furthermore, there were no statistically significant changes in the blood parameters, including the complete blood count, liver function tests, and serum electrolytes, for any of the patients. Similarly, no statistically significant change (*p*-value 0.12) in the Body Mass Index (BMI) was observed at the end of the study.

The frequency of local adverse effects of the intralesional injections was comparable between the two treatment groups (*p*-value 0.19). Hypopigmentation occurred in five cases (10.9%) of keloid scars in the TAC group, while only one case (2.3%) was reported in the 5FU group. Hyperpigmentation and superficial ulceration occurred solely in the 5FU group. There was no statistically significant difference (*p*-value 0.19) in the occurrence of these adverse effects between the two groups.

Discussion

Treatment of keloid remains a considerable challenge, with various intralesional options described. This study compared intralesional triamcinolone acetonide (TAC) to intralesional 5-fluorouracil (5FU) in treating keloids located in the head and neck region. The results indicated that TAC was more effective than 5FU; it led to a more significant reduction in both the Overall Patient Observer Scar Assessment Scale (POSAS) and Patient-related POSAS scores. Patients treated with TAC also experienced a more substantial decrease in the length and height of their keloids than those treated with 5FU.

The mean age of the patients in this study suggests that younger individuals are more likely to seek treatment for keloids, especially for lesions in the head and neck region. This aligns with several reports indicating that younger patients commonly seek care for keloid scars.[10,19–23] This may be attributable to the heightened self-consciousness about body image and peer pressure among younger individuals. Additionally, the gender distribution in this study reflects the greater aesthetic concern among females, particularly with keloids in visible areas like the head and neck that are difficult to conceal. The common practice of ear piercing, especially second piercing in females, also contributes to this trend, similar to reports from other regions, nationally[10,21] and globally.[20,24] Furthermore, another study[1] observed that females often feel more stigmatised about their keloid than males.

Previous studies[9,24] have noted a higher prevalence of keloids on the cheek and the earlobe, which corresponds with the findings of this study. These locations may be prone to keloid formation due to trauma, ear piercing and acne. Furthermore, the difficulty of concealing keloid scars in these areas may lead more individuals to seek treatment. The lower incidence of itching reported among the patients in this study is comparable to the 28.9% rate observed by Olaitan and colleagues in Southwestern Nigeria[1] but lower than the 64.3% reported in an Indian study[16], which may be attributable to racial differences. Nevertheless, the high levels of cosmetic concern recorded in this study parallel those in the aforementioned study, highlighting the need for effective and safe keloid treatments.

The statistically significant reductions observed in the Patient and Observer Scar Assessment Scale (POSAS) as well as the dimensions of the scars in both treatment groups indicate that both intralesional TAC monotherapy and intralesional 5FU monotherapy are effective in treating keloid scars. This finding is consistent with prior studies on keloid treatment.[9,14–16,19,24–26] However, this study demonstrates that intralesional TAC is more efficacious than intralesional 5FU. In concordance with this finding, Prabhu et al.[27] reported that intralesional TAC significantly reduced keloid size more effectively than intralesional 5FU in the treatment study. Unlike the current research, their study evaluated keloids from all parts of the body.

The superiority of TAC noted in this study contrasts with the findings of Sadeghinia and Sadeghinia[17], who conducted a double-blinded, randomised, clinical trial. They reported superior outcomes of all measured parameters (patient self-assessment and observer assessment) with 5FU compared to TAC. This difference may be due to their method of administering 5FU, described as "5FU tattooing". They first anaesthetised the lesion with a 2% lidocaine injection, then dripped 1 ml of 5FU at a concentration of 50 mg/ml onto each 1 cm^2 of the keloid. They made 40 punctures per 5 mm^2 on the lesions using a 27-gauge needle before drizzling another 1 mL of 5FU solution over the keloid and then covering it. This injection method may have enabled better distribution of the 5FU

Print ISSN: 0189-9287 Online ISSN: 2992-345X

within the keloid scars, resulting in a favourable response.

Furthermore, the report from Kolkata, India[28], diverges from this research. Although their study employed a weekly injection regimen compared to the fortnightly injection used in this study, they found both TAC and 5FU to be equally effective in treating keloids. This contrasts with our findings, which show that TAC is more effective. Their study duration of two and a half years may have allowed adequate follow-up to observe the long-term effects of both treatment agents.

Similarly, Manuskiatti and Fitzpatrick[29] found no significant difference in the mean scar height when comparing 5FU monotherapy, TAC monotherapy, 5FU + TAC, and Pulsed Dye Laser for treating keloids and hypertrophic sternotomy scars. In contrast, Hietanen et al.[30] reported comparable treatment outcomes when keloids were treated with intralesional TAC or 5FU, noting that fibroblast proliferation decreased in the TAC group but increased in the 5FU group.

The safety of intralesional TAC and intralesional 5FU, as indicated by the lack of significant changes in the laboratory parameters of the patients in this work, aligns with the findings of previous studies.[15,16,19,23,28,31] This might be due to the poor vascularity of keloid scars, resulting in minimal systemic absorption of the drugs when injected into the scar tissue. The complication rate observed in this study is similar to that of another study[27] but lower than some studies that utilised higher concentrations of the agents and more frequent injections.[16,28,30] This suggests a need to identify the optimal doses and frequencies of these intralesional steroids and chemotherapeutic drugs.

The hypopigmentation caused mainly by TAC, which may be a concern in dark-skinned individuals like the patients in this study, could be due to sub-epithelial injection of the steroid instead of the proper intradermal plane. However, the hypopigmentation is reversible upon discontinuation of the intralesional injections. Hietanen et al.[30] reported more complications in patients treated with TAC than those treated with 5FU, contrary to our findings. They found a significant difference in the incidence of skin atrophy, unlike this study, where such discrepancies were not observed. The 4.5% ulceration rate recorded in the 5FU group in this study is comparable to the 4.2% previously reported.[15] The ulcerations were superficial and healed well with povidone-iodine dressings.

Limitations

The study is limited by its short follow-up duration, which may have hindered the identification of differences that required more time to emerge, including potential side effects. A study with a longer follow-up period may be necessary to identify the long-term results of these intralesional treatment agents for keloids.

Implications of the findings of the study

Both intralesional Triamcinolone (TAC) and intralesional 5-Fluorouracil (5FU) can be used to treat keloid scars; however, TAC should be preferred because of its higher effectiveness. Caution should be exercised when administering Triamcinolone in exposed areas of dark-skinned individuals, as it may result in hypopigmentation.

Conclusion

In conclusion, younger individuals, especially females, are more likely to seek treatment for keloids due to cosmetic concerns. Keloids commonly occur on the head and neck, particularly affecting the cheeks and earlobes, and require appropriate treatment. Both triamcinolone acetonide and 5-fluorouracil are effective treatments for keloid scars in these areas. However, intralesional triamcinolone acetonide is more effective, as it reduces the length and height of the lesions more than 5-fluorouracil. Additionally, triamcinolone acetonide results in greater improvements in the POSAS Overall and Patient scales compared to 5-fluorouracil. Both treatments have comparable complications, typically local and tolerable to the patients. Importantly, any hypopigmentation caused by triamcinolone acetonide resolves once treatment is discontinued.

Declarations

Authors' Contribution: Concept: MAA and JNL
Design: MAA, MHI, and JNL
Literature search: MAA, MHI, and JNL
Data acquisition: MAA, MHI, and JNL
Data analysis: MAA and MHI
Manuscript preparation: MAA, MHI, and JNL
Manuscript editing and review: MAA, MHI, and JNL
Conflict of interest: No conflict of interest
Funding: The authors received no funding for the study

Print ISSN: 0189-9287 Online ISSN: 2992-345X

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