Original Research Paper

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UNLOCKING THE BATTLE AGAINST KELOIDS: COMPARING THE EFFECTIVENESS OF INTRALESIONAL 5-FLUOROURAC VERSUS A DYNAMIC DUO OF 5-FLUOROURACIL AND TRIAMCINOLONE ACETONIDE

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ABSTRACT **Background & Objectives** Keloids are characterised by their infiltration of neighbouring tissues and infrequent regression. This research emphasises the efficacy of 5-fluorouracil (5-FU) in the treatment of keloids. The purpose of this investigation was to assess the effectiveness of intralesional 5-FU in keloids, and in combination with triamcinolone acetonide, as well as to examine the adverse effects of both medications.

KEYWORDS :

INTRODUCTION

Scar tissue accumulation occurs as a consequence of dermal injury throughout the wound healing process. Keloids are defined clinically as lesions that invade neighbouring tissues and seldom regress[1]

The mechanisms underlying the pathogenesis of keloids remain inadequately understood, despite their considerable incidence in the general population. This lack of understanding results in the absence of a single, efficacious treatment option and causes frustration for both healthcare providers and patients.

Antimitotic medications such as retinoic acid, bleomycin, mitomycin-c and interferon- γ have been utilised with encouraging results in the treatment of keloids in recent years

AIMS AND OBJECTIVES

The purpose of this investigation was to assess the effectiveness of intralesional 5-FU in keloids, both alone and in combination with triamcinolone acetonide, as well as to examine the adverse effects of both medications

MATERIALS AND METHODS

Study Area: Department of Dermatology, Mayo Institute Of Medical Sciences, Barabanki

Study Type: Prospective Comparative Study

Sample Size: 37

Inclusion Criteria

- Patients aged 18 years and older.
- Patients with clinically diagnosed keloids.
- Patients who are physically able to complete the treatment and follow-up procedures

Exclusion Criteria

- Patients under the age of 18.
- Pregnant or breastfeeding women.
- Patients with a history of severe allergies or hypersensitivity to 5-fluorouracil or triamcinolone acetonide.
- Patients with pre-existing medical conditions that may contraindicate treatment with the study drugs.
- Patients with keloids in anatomical locations that are not amenable to intralesional injections or assessment.
- Patients who have received prior treatment for keloids within the past 6 months.
- Patients with a history of adverse reactions to 5-fluorouracil or triamcinolone acetonide

METHOD

Group A and Group B was randomally divided by lottery method.A 27-gauge insulin syringe was used to inject 50 mg/mL of 5-FU intralessionally into the group A patients. The patients in group B were administered 40 mg/mL of triamcinolone acetonide plus 50 mg/mL of 5-FU intralesionally. A 1:1 ratio of 0.1 mL of each solution was injected in a similar manner to group A patients.The distance between the two sites were separated by 1 cm. Both immediate and delayed problems were monitored in the individuals. In the following 48 hours, the patients were asked to report back if any other negative effects materialized. For a maximum of three months, the operation was repeated every two weeks during the first month and then every month until the lesions showed full flattening, down to the level of the surrounding tissue. The patients' discomfort was evaluated

RESULT

Males comprised the majority of Group-A (mean age 21.52±2.57) and Group-B (mean age 22.46±3.54), but the difference between the two groups was not statistically significant.

The patients in both groups exhibited statistically significant decrease in both the dimensions and girth of the lesions. However the difference between the outcome of 2 groups was not statistically significant

LENGTH OF KELOID		n	Mean	ANOVA	P
Group A	Week0	19	4.789	2.162	0.0431*
	week2	19	4.000		
	week6	19	3.66		
	week10	19	3.18		
Group B	week0	19	3.870	2.825	0.0326*
	week2	19	3.61		

	Week6	19	3.09		
	Week10	19	2.05		
	week10	19	2.15		

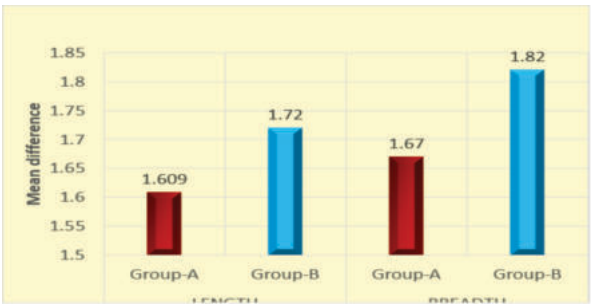
For Group A and B at Week 0, the mean keloid length was 4.79±1.41 and 3.870±1.87 whereas, at week 10 is 3.18±1.63 and 2.15±1.09. The ANOVA results indicate a statistically significant difference in keloid length between the follow-up in group-A and as well as in group-B. The decreasing trend in mean keloid length across subsequent weeks suggests a reduction in keloid size in both groups

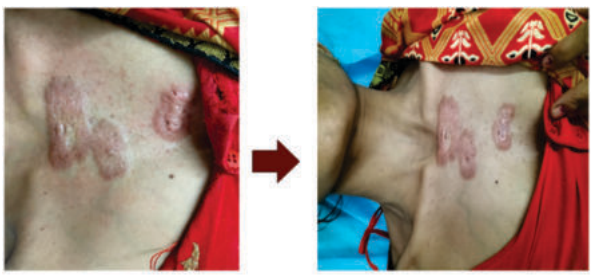
BREADTH OF KELOID		n	mean	ANOVA	P
Group A	week0	19	1.98	4.121	0.0107*
	week2	19	1.24		
	week6	19	1.11		
	week10	19	1.08		
Group B	week0	19	1.09	3.169	0.0319*
	week2	19	0.87		
	week6	19	0.68		
	week10	19	0.51		

For Group A and B at Week 0, the mean keloid breadth was 3.34±1.98 and 2.47±1.09 whereas, at week 10 is 1.67±1.08 and 0.65±0.51. The ANOVA results indicate a statistically significant difference in keloid breadth between the follow-up in group-A and as well as in group-B. The decreasing trend in mean keloid breadth across subsequent weeks suggests a reduction in keloid size in both groups

Tukey's multiple comparisons test				
LENGTH	Group-A	Week 0 vs. Weeks 10	1.609	0.0396*
	Group-B	Week 0 vs. Weeks 10	1.720	0.0257*
BREADTH	Group-A	Week 0 vs. Weeks 10	1.67	0.0207*
	Group-B	Week 0 vs. Weeks 10	1.82	0.0101*

Overall, based on the Tukey's test results, both Group A and Group B show significant improvements in keloid size. However, Group B appears to have a slightly more pronounced reduction in both length and breadth, suggesting that it may be slightly more effective in treating keloids.





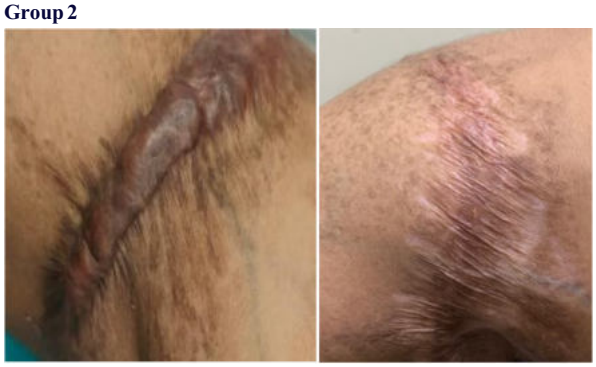
BEFORE AFTER

Group 2

Incidence of adverse effect	GROUP-A [n=19]		GROUP-B [n=19]		P-value
	N	%	N	%	
Pain	4	21.05%	2	5.26%	X=1.122 P=0.8908
Itching	3	15.79%	1	2.63%	
Ulceration	2	10.53%	0	0.00%	
Burning sensation	5	26.32%	1	2.63%	
Bulla formation	3	15.79%	1	2.63%	

Group B exhibited a lower incidence of adverse effects across all categories compared to Group A. Specifically, Group A tended to experience higher rates of pain (21.05% vs. 5.26%), itching (15.79% vs. 2.63%), burning sensation (26.32% vs. 2.63%), and bulla formation (15.79% vs. 2.63%).

Group 2



Before **After**

DISCUSSION

Since preventing any stage of mitosis causes cell proliferation to stop and apoptosis to begin, blocking mitosis is the foundation for cell growth. Antitumor medic ations that have been utilised to treat keloids include retinoic acid, 5-fluorouracil, bleomycin, mitomycin-C, and interferon-γ .[3–4].

The pyrimidine analogue 5-FU most likely works by interfering with TGF-β signalg and the subsequent stimulation of type I collagen gene expression. It has been discovered o have an inhibitory effect on human fibroblast cell lines in culture[5], and in vitro studies on Dupuytren fibroblasts have shown that it also suppresses myofiberation.(6)

The intralesional dosage of 5-FU has not been associated with any systemic side effects, such as anaemia, leucopenia, thrombocytopenia, or negative effects on reproductive processes.(7) Fitzpatrick and Manuskiatti observed that the 5-FUnly group outperformed all other groups with the advantage of a faster resolution and avoidance of the side effects of steroid injection in a four-arm research involving intralesional steroid, steroid with 5-FU, and 585nmpulse-dyed(8)

Since the middle of the 1960s, intralesional corticosteroid injections—of which kenocort is the most often utilised—have been used to treat keloids and scars.10] The way that corticosteroids work is by reducing inflammation, which leads to vasoconstriction and interrupts the keloid's supply of oxygen and nutrients. They also have an antimitotic action on effect on keratinocytes and fibroblasts.11] In addition, it has the ability to cause scar regression, fibroblast proliferation inhibition, and suppression of vascular endothelial growth factor expression.In [12]

Limitations

Firstly, the relatively short follow-up period is a constraint, and ideally, a more extended follow-up duration would have provided a more comprehensive assessment of treatment outcomes. Additionally, while including a third arm involving steroid treatment alone would have been ideal for a more comprehensive analysis, we decided against it. This decision was based on our awareness of the established efficacy of steroids in keloid reduction.

Moreover, given the higher recurrence rates associated with steroid treatment, we chose to focus on the two-arm study design to ensure a more manageable and practical approach

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