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A Comparative Study of Therapeutic Efficacy between Intralesional Steroids and Cryotherapy in the Management of Keloids

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Abstract

Introduction: *Keloids and hypertrophic scars are abnormal response of body to skin injuries. Keloids develop as a result of abnormal proliferation of dermal collagen tissue following skin injury. In our study the result of treatment of keloids with intralesional steroids are compared with cryotherapy.*

Material & Methods:*It's a Prospective &Interventional study done among patients with a clinical diagnosis of keloids. A total of 30 patients were selected for the study over a period of 6 months by convenient sampling technique.In each patient, two interventions were done. One lesion with Intralesional corticosteroids and another with cryotherapy. Follow up was done to determine the effectiveness.*

Results:*Out of the 30 study participants, mean age was 25.2±4.8 years with majority belonging to 20-30 years age group (n=14, 46.7%) followed by 31-40 years (n=7, 23.3%). There was a male preponderance with 63.3% (n=19). Family history of keloid was found only in 3 patients. In more than half the proportion of the cases (53.3%), keloid lesions were present on the chest with size being less than 5 cm in majority (70%). The mean scar height in initial stages among cryotherapy group was 3.62mm which reduced to 0.85 mm after first month and completely resolved by 6 months. In the ILS group, mean scar height was 1.18 even after six months of treatment.*

Conclusions: *There was a statistically significant reduction in the scar height, thickness, surface area, scar volume & consistency in the lesions where cryotherapy was done compared to intralesional steroid (ILS) therapy.*

Keywords:*keloid, collagen, intralesional steroids, cryotherapy, efficacy*

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I. Introduction

Keloids and hypertrophic scars are abnormal response of the body to skin injuries. Overproduction of compacted fibrous tissue is basic cause of these lesions. Keloids are characterised by increased collagen and glycosaminoglycans content as a result of increased collagen turnover.

Keloids develop as a result of abnormal proliferation of dermal tissue following skin injury.The pathophysiology of disease is still under obscure, but it has been suggested that combination of high prolidase activity (up to four-fold compared to normal skin) and increase in type I procollagen and type I collagen concentration in the tissue (especially the latter) are involved. There is hereditary or racial predisposition. The common sites are the pre sternal area, ear lobes, shoulders, ankles and/or face[1,2,3].

Keloids may cause itching, discomfort, pain, movement limitation (if very large), and other physical and psychological problems.

With regards to treatment of keloids, no single approach is uniformly effective in the patients and many require multiple treatment options[4].

(i) Intralesional corticosteroids (ILS)
(ii) 5-Fluorouracil (5-FU) intralesional injections
(iii) Cryotherapy
(iv) Surgical excision
(v) Pressure therapy
(vi) Silicone products

Among the most common treatments are intra lesional corticosteroid injections and cryotherapy as well as a combination of these two modalities.

Intralesional corticosteroids (ILS) is the frequently used modality, the steroid most commonly used, being depot preparation of triamcinolone acetonide (40 mg/ml).It is important toinject the steroid in mid-dermis,otherwise it may lead to irreversible atrophyof the epidermis. Injections are repeated oncein 3–4 weeks depending on the bulk of keloid. The total number ofinjections depends on the clinical response which varies in each patient. Pain during injection is an importantlimiting factor[5].

Based on the extensive review of the studies and literature, Cryosurgery with liquid nitrogenleads to total or partial response in almost three-fourth of keloids after at least three sessions[6,7]. Hypopigmentation, blistering,delayed healing and infection are the major sideeffects[8]. A combination of liquidnitrogen cryosurgery and intralesional steroidsseems to have a synergistic effect over liquidnitrogen cryosurgery alone[9]. Liquidnitrogen cryotherapy done prior to the intralesionalinjection softens the keloid and makes the injectionmore easier and leads to uniform dispersal of thedrug into the tissue. Cryotherapy inducesedema and cellular breakdown, causing a further decreasein the density of fibrous tissue so that the injectioncan be given easily.

The ultimate goal of treatment of keloids should be low recurrence rate, minimal adverse effects and significant cosmetic improvement.

Objective of our study is to compare the therapeutic efficacy of intralesional steroids to cryotherapy in the management of keloids.

II. Material & Methods

It's a Hospital based prospective &interventional study done among patients with a clinical diagnosis of keloids presenting to OPD Dermatology Venereology and Leprosy in Gandhi Medical College and Hospital. Study period was from August 2018 to July 2019.

Inclusion criteria

All patients with keloids in accessible regions of body and who were willing to participate in the study. Keloids on similar site(location), size were selected for the comparison study.

Exclusion criteria

Immunocompromised patients such as HIV patients, patients on systemic steroids, Diabetes Mellitus, Pregnancy & lactation

Patients who were not willing and those who have already taken any sort of treatment for the keloids

Sample size & Study duration: A total of 30 patients were selected for the study over a period of 12 months by convenient sampling technique.

The study participants were selected after fulfilling the inclusion and exclusion criteria.Patients were enrolled after informed consent and a detailed clinical history taken, clinical examination and documentation was done. Routine investigations done includingHIV I & II, HBsAg and CT BT.

In each patient, two interventions were done,one lesion with ILS and another with cryotherapy.Followup was done at monthly intervals to determine the effectiveness.

Statistical analysis:

The data was tabulated and analysed.The quantitative data was summarized in excel sheet. Mean, median, standard deviation was estimated.Microsoft word and excel was used for preparation of graphs and charts.Appropriate statistical tests such as 't' test was applied wherever necessary to determine any difference. In above test "p" value less than0.05 was accepted as indicating statistical significance.

III. Observation And Results

Out of the 30 study participants, mean age was 25.2±4.8 years with majority belonging to 20-30 years age group (n=14, 46.7%) followed by 31-40 years (n=7, 23.3%). There was a male preponderance with 63.3% (n=19) with a male to female ratio being 1.7:1. The mean duration of the disease was 1.8±0.5 years. The commonest site being chest.

Family history of keloid was found only in 3 patients.

The major etiological factors for keloid formation were non-specific trauma (20%), acute folliculitis (16.7%) and truncal acne (10.5%).

Keloid characteristics:

In more than half the proportion of the cases (53.3%), keloid lesions were present on the chest with size being less than 5 cm in majority (70%).

With regards to symptomology, most patients presented with cosmetic problems (83.3%) and others with discomfort, pruritus, pain, tenderness etc.

Table 1: Comparison of the Qualities of surface area, height and volume of scar in the two therapy groups at different stages

		Cryotherapy	ILS	Significance
Scar height (mm)	Original size	3.62	3.12	0.2
	After 1st month	0.85	1.67	0.0009
	After 6 months	--	1.18	0.000001
Scar surfacearea (mm^2)	Original size	125.17	110.54	0.3
	After 1st month	18.94	98.71	0.000001
	After 6 months	--	56.15	0.000001
Scar volume (mm^3)	Original size	425.78	410.34	0.5
	After 1st month	34.94	286.37	0.000001
	After 6 months	--	110.49	0.000001

For each patient, on one lesion cryotherapy was given and for another with ILS and patients were followed up till 6 months. The results of both the interventions were compared over a period of time for scar height, its surface area and volume.

There was a statistically significant reduction in the scar height, surface area and scar volume in the lesions where cryotherapy was done compared to intralesional steroid (ILS) therapy as mentioned in the table 1.

The mean scar height in initial stages among cryotherapy group was 3.62mm which reduced to 0.85 mm after first month and completely resolved by 6 months. In the ILS group, mean scar height was 1.18 even after six months of treatment.

With regards to scar surface area, the mean area was 125.17 mm^2 and 110.54 mm^2 respectively in the cryotherapy and ILS groups. In the cryotherapy, there was significant reduction in surface area to 18.94 mm^2 and then complete resolution compared to ILS group.

And lastly with scar volume, there was again a statistically significant reduction in the scar volume from 425.78 mm^3 to complete resolution in cryotherapy group.

Side effects in the ILS group included hypopigmentation (2 cases), telangiectasia and atrophy in 1 case each. In cryotherapy, the only side effect noticed was temporary scar hypopigmentation in 3 cases which disappeared in the follow up of 6 months.

IV. Discussion

The present hospital basedprospective &interventional study was done among 30 patients to compare therapeutic efficacy of intralesional steroids vs cryotherapy in the management of keloids. Present study found a significant reduction the scar height, scar surface area and scar volume in the keloids which were subjected to cryotherapy.

Similar kind of findings were seen in HamidehAzimiAlamdari et al (2018)[10] where a significant decline was found in surface area, height and volume of the scars with cryotherapy after the first session compared to other 2 methods. The decline in surface area, height and volume after the sixth session was 52.9%, 61.37%, and 78.06% respectively with steroid injection and 32.16%, 58.07%, and 60.67% with 5-FU injection. Side effects were permanent hypopigmentation, telangiectasia and atrophy in the steroid group; surface wound, hyperpigmentation and increased pain in the 5-FU group; and temporary hypopigmentation in the cryotherapy group. And their study concluded stating that intralesional cryotherapy accelerates keloid healing and has fewer side effects than other treatments.

A comparative study of intralesional injection of triamcinolone acetonide alone versus combined cryotherapy and triamcinolone acetonide by Punit Kumar Singh and Mani Kant Kumar (2015) [11] found that combination of cryotherapy followed by intralesional injection of triamcinolone acetonide (40mg/ml) required

lesser number of procedures (3-5) for excellent (76-100%) flattening of the lesions, reduction of complain of pain /tenderness (100%), pruritus (90%), restricted mobility (70%) and cosmetic problems (84%). Recurrence rate was comparatively much less with cryotherapy followed by intralesional injection of triamcinolone acetonide.

V. Conclusions

With regards to treatment of keloids, no single approach is uniformly effective in the patients and many require multiple treatment options. Among the most common treatments are intra lesional corticosteroid injections and cryotherapy as well as a combination of these two modalities. When compared to intralesional steroid (ILS) therapy , there was a statistically significant reduction in the scar height, thickness, surface area, scar volume and consistency in the lesions in the present study where cryotherapy was done.

References

[1]. Duong HS, Zhang QZ, Le AD, Kelly AP, Kamdar R, Messadi DV. Elevated prolidase activity in keloids: correlation with type I collagen turnover. Br J Dermatol. 2006 ;154(5):820-8.
[2]. Blobe GC, Schiemann WP, Lodish HF. Role of transforming growth factor - beta in human disease. N Engl J Med 2000;342:1350-8.
[3]. Alster TS, Tanzi EL. Hypertrophic scars and keloids etiology and management. Am J Clin Dermatol 2003;4:235-43.
[4]. Gupta S, Sharma VK. Standard guidelines of care: Keloids and hypertrophic scars. Indian J Dermatol VenereolLeprol 2011;77:94-100.
[5]. Muneuchi G, Suzuki S, Onodera M, Ito O, Hata Y, Igawa HH.Long-term outcome of intralesional injection of triamcinoloneacetonide for the treatment of keloid scars in Asian patients.Scand J PlastReconstrSurg Hand Surg 2006;40:111-6.
[6]. Zouboulis CC, Blume U, Buttner P, Orfanos CE. Outcomes ofcryosurgery in keloids and hypertrophic scars. A prospectiveconsecutive trial of case series. Arch Dermatol 1993;129:1146-51.
[7]. Ernst K, Hundeiker M. Results of cryosurgery in 394 patientswith hypertrophic scars and keloids. Hautarzt 1995;46:462-6.
[8]. Rusciani L, Rossi G, Bono R. Use of cryotherapy in the treatmentof keloids. J Dermatol Surg Oncol 1993;19:529-34.
[9]. Sharma S, Bhanot A, Kaur A, Dewan SP. Role of liquid nitrogenalone compared with combination of liquid nitrogen andintralesional triamcinolone acetonide in treatment of smallkeloids. J Cosmet Dermatol 2007;6:258-61.
[10]. HamidehAzimiAlamdari, GhazalehDavarnia, HamidehHerizchiGhadim, Asal Sadri. Intralesional Cryotherapy Versus Intralesional Corticosteroid and 5-Fluorouracil in the Treatment of Hypertrophic Scars and Keloids: A Clinical Trial. Crescent Journal of Medical and Biological Sciences 2018;5(3):215-21.
[11]. Punit Kumar Singh, Mani Kant Kumar. A comparative study of intralesional injection of triamcinolone acetonide alone versus combined cryotherapy and triamcinolone acetonide. IOSR Journal of Dental and Medical Sciences 2015;14(11):19-23.

FIGURES:

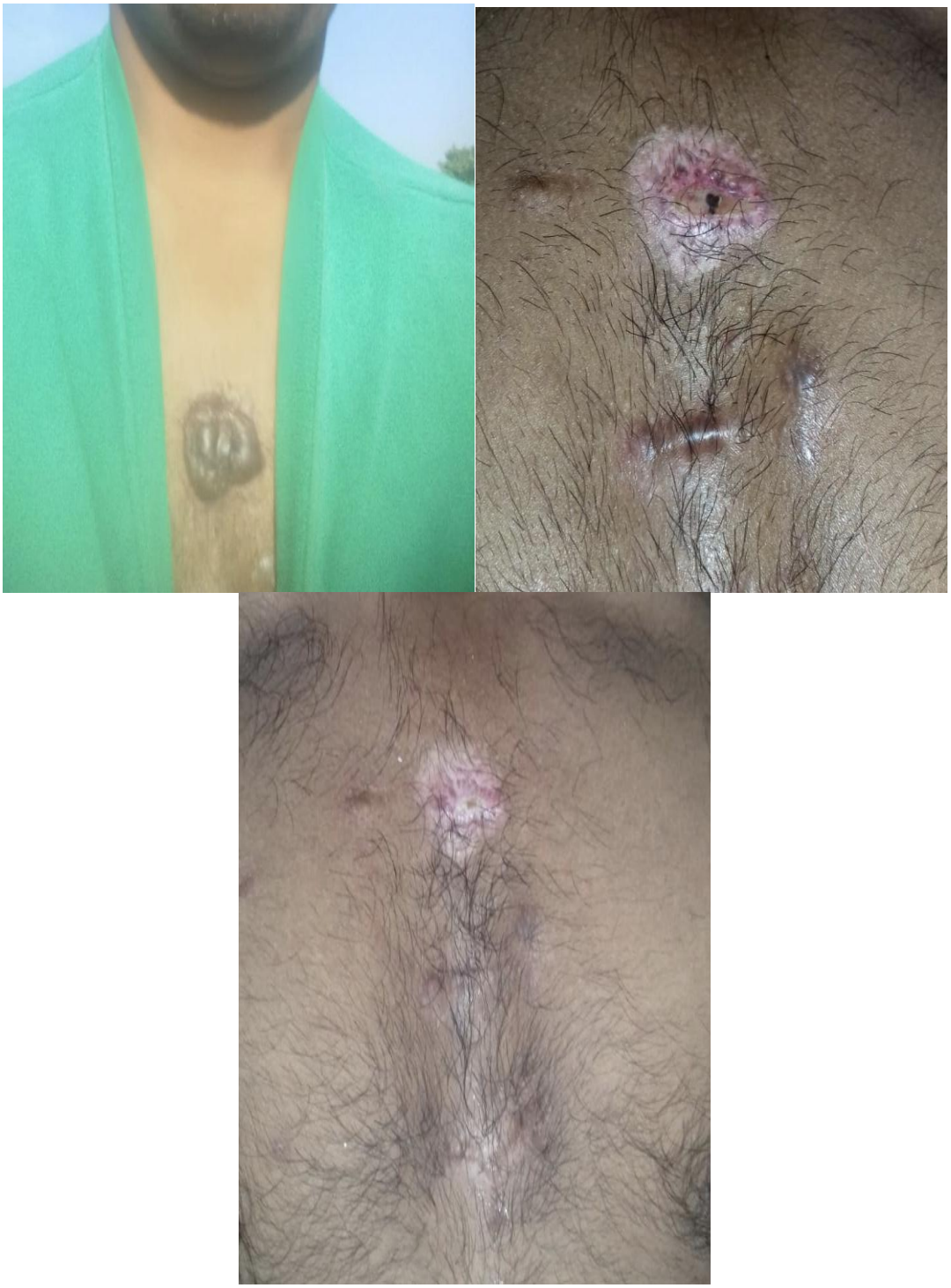

Figure 1: A patient with Keloid treated with cryotherapy after each sitting

Figure 2: Patient regained pigmentation during6months followup after cryotherapy

Figure 3: Pictures of a patient with Keloid treated with ILS over subsequent sittings