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A comparative study of intralesional injection of triamcinolone acetonide alone versus combined cryotherapy and triamcinolone acetonide

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Abstract:

Background: *A keloid is dysregulated firoproliferative scar tissue in response to skin injuries, which extends beyond the wound margin. Since it has a poor response to treatment, variable therapies are used. Current therapies of keloid include intralesional corticosteroid injection, cryotherapy and various laser therapies, silicone gel sheets (pressure therapy), interferon-α-2b, 5-floruracilorbleomycine administration. In this scenario, the present study was designed to evaluate the effect of combined intralesional triamcinolone acetonide injection with cryotherapy vs. Intra lesional triamcinolone alone in the treatment of keloids.*

Objective: *This study was aimed to evaluate the efficacy of combined intralesional triamcinolone acetonide injection with cryotherapy vs. Intra lesional triamcinolone alone in the treatment of keloids.*

Settings: *After approval of the study protocol from the ethical committee of the institute, a total one hundred patients attending at Department of Dermatology Venereology and Leprosy, Narayan Medical College, Bihar, India between August 2009 to July 2014 having keloids were included in the study.*

Study Design: *Hospital based comparative study . The 100 keloid patients were randomly divided into two groups, Group -A:Intralesional injection of 40/ml undiluted Trimacinolone acetonide was given alone. Group - B: Cryotherapy followed by intralesional injection of triamcinolone acetonide.*

Results: *The maximum no. of patients was in the age group between 11-30 yrs (64%), the average age was 29.2 yrs, 64% cases were male and 36% were female with a male to female ratio 1.8:1. Cosmetic problems form the main symptom in both the groups with 100%. The response after completion of treatment showed excellent result in group B with 48% of lesions flattened . The recurrence after completion of treatment during follow up in group B patients was found to be 12 % of lesions whereas recurrence is 76% of lesions in group A patients.*

Conclusion: *The present study conclude that the 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%).*

Key Words: *Keloids, Intralesional, Triamcinolone, Cryotherapy.*

I. Introduction

Keloids are the result of an overgrowth of dense fibrous tissue that usually develops after healing of a skin injury. The tissue extends beyond the wound margin to recur after excision. The keloid scar is benign, non-contagious and characterized by extensive itching, severe pain and changes in skin morphology. During the advanced stages, the it can affect movement of skin and may ulcerate. The probability of recurrence of keloids after surgical removal is high, usually greater than 50% (Hunasgi et al., 2013 and Maghrabi and Kabel, 2014).The pathophysiology of disease is still under obscure, but the report suggest that combination of high prolidase activity (up to four-fold compared to normal skin) and the increase of type I procollagen and type I collagen concentration in the tissue (especially the latter) are involved (Duong et al., 2006). There is hereditary or racial predisposition. The condition affects the pre sternal area, ear lobes, shoulders, ankles and/or face.

Keloids may cause pain, movement limitation, and other physical and psychological problems. Thus, the search for an effective treatment is therefore essential. Among the most common treatments are intra lesional corticosteroid injections and cryotherapy as well as a combination of these two modalities (Urioste et al., 1999, Hirshowitz et al., 1982). Cryotherapy as a sole treatment has not appeared to be efficient; however, a recent uncontrolled study suggested that it responded well (Zouboulis et al., 1993). Overall, few studies have been performed in a controlled fashion to evaluate the efficacy of these treatments. In this scenario, the present study

was designed to evaluate the effect of combined intralesional triamcinolone acetonide injection with cryotherapy vs. Intra lesional triamcinolone alone in the treatment of keloids.

II. Material and Methods

A total of 100 patients attending at Department of Dermatology Venereology and Leprosy, Narayan Medical College, Bihar, India between August 2009 to July 2014 having keloids were included in the study.

Inclusion criteria

The patients with age between 10-80 years, No flattened keloid lesions, keloids of variable sizes measuring up to 10 cm in diameter and no history of relevant illness associated with study were included. A written consent was taken from each patient before the study.

Exclusion criteria

Pregnancy, lactation, chronic renal failure and any abnormalities of liver function tests and family history of keloidal tendency or hypertrophic scar formation.

III. Study Groups :

The 100 patients with keloid were randomly divided into two groups, group A and group B.
Group - A: Intralesional injection of 40/ml undiluted Trimacinolone acetonide was given alone. **Group - B:**Cryotherapy followed by intralesional injection of trimacinolone acetonide.
All patients were subjected to complete history taking and dermatological examination included site, size, shape, color and consistency of the lesion. Investigations includes complete blood count (CBC), liver and kidney functions were done before treatment. The patients were informed about the nature of each procedure, expected number of treatments and also expected side effects of the procedure.

The color of the keloid was noted and classified depending on its darkness compared to the surrounding skin. The consistency of the keloid was classified as either hard, soft or consistency similar to the surrounding skin. The clinical appearance was classified into the atrophic, hypertrophic or nodular categories. Pain was recorded using the visual analog scale (VAS), at each visit. Other features like skin atrophy, erythema, ulceration, skin necrosis, hypopigmentation or hyperpigmentation, and other features were also recorded. This protocol was followed for every patient over all the visits. The flattening of lesions based on clinical assessment of the depth of the lesion with a skin fold calliper.

IV. Results:

The maximum no. of patients was in the age group between 11-30 yrs (64%), the average age was 29.2 yrs, 30-50yrs (24%),50-70 yrs (12%) respectively. The distribution of sex among the groups revealed that 64% cases were male and 36% were female with a male to female ratio 1.8:1. 60 % cases had duration of disease varying from 1-3 years. The etiological factors for keloid formation was found to be acne folliculitis 64%, nonspecific trauma 20%, surgery 16%, site of BCG vaccination 8% burn 4% and ear piercing 2%. The history of previous treatment among the groups was 84% had not taken any treatment whereas only 16% have undergone treatment. The family history of keloid was positive in only 8% and negative in 92%.

Fifty two percent **(**52%) of keloid lesions were present on the chest in group A whereas 56%in group Majority of keloid lesions observed were (> 76%) were less than 5 cm in both the groups.Mostly patients are presented with the sign of symptoms with cosmetic problems and having pruritus rarely having pain and tenderness. Clinical observation during and after the procedure in keloid lesions and their comparison in both groups. Cosmetic problems form the main symptom in both the groups with 100% as shown in table – 1.

Table - 1 Sign and symptoms of keloid lesions between the groups

	Group A		**Group B**	
Sign & symptoms	**No. of lesion**	**%**	**No. of lesions**	**%**
Cosmetic	50	100	50	**100**
Pruritus	42	84	40	**80**
Restriction of Movement	18	36	20	**40**
Pain	8	16	12	**24**
Tenderness	**8**	**16**	**12**	**24**

In group A, 64% of patients and in group B 36% of patients in group B showed stinging sensation during treatment. The development of edema in group B was found to be 16 patients during / after treatment and 12 patients develop edema after 1 week and 12 patients developed pain and tenderness at 48 hrs. Incidences of edema, pain and tenderness were not occurred in group A.64% patients of group B (table - 2) develops bulla

after 12 hrs and after 48 hrs, only 12% patients develops bulla.64% of bulla ruptured on 1st day in group B.64% patients develops eschar formation on 3 rd week in group B. In group A, bulla formation was not seen.

Table – 2 Time of bulla formation:-

Time of Bulla formation	Group A		Group B	
	No. of lesion	%	No. of lesions	%
½ -2 hrs	0	0	0	**0**
After 2 hrs	0	0	0	**0**
After 12 hrs	0	0	32	**64**
After 24 hrs	0	0	12	**24**
After 48 hrs	**0**	**0**	**6**	**12**

The time taken for the ulcer to heal completely were shown in Table – 3, it shows that 40 % of lesions healed completely in 1stweek in group B. The prevalence of secondary infection was most prevalent in group B patients ie., no infections were seen in group A patients.

Table – 3 Ulcer healing between the groups

Weeks of ulcer healing	Group A		Group B	
	No. of lesions	%	No. of lesions	%
1st	0	0	20	**40**
2nd	0	0	18	**36**
3rd	0	0	12	**24**
4th	0	0	0	**0**
5th	**0**	**0**	**0**	**0**

In group B, 30 % of patients develop reversible hypo-pigmentation whereas in group A patients lesions become hypo pigmented after procedure in 40% (table - 4).

Table – 4 Post procedure pigment changes

	Group A		Group B	
Pigmentation	No. of lesion	%	No. of lesions	%
Hyper pigmentation	0	0	0	**0**
Hypo pigmentation (Reversible)	0	0	15	**30**
Hypo-pigmentation Non reversible	**20**	**40**	**2**	**4**

The response after completion of treatment showed excellent result in group B with 48% of lesions flattened (table - 5). The recurrence after completion of treatment during follow up in group B patients was found to be 12 % of lesions whereas recurrence is 76% of lesions in group A patients.

Table 5 - Type of response after completion of treatment

Flattening of lesions	Group A		Group B	
	No. of lesions	%	No. of lesions	%
76 – 100%	8	16	24	**48**
51 – 75 %	12	24	12	**24**
26 – 50 %	22	44	08	**16**
< 25	**8**	**16**	**08**	**16**

V. Discussion:

Keloid is an abnormal fibrotic disfiguring scar with claw like extension in the normal skin. It becomes raised and thickened within 3-4 weeks of the provocative stimulus. It is often irritable, hypersensitive and sometime tender and cosmetic problems. It represents a model of altered wound healing with over production of extracellular matrix and marked proliferation of fibroblasts. Their exact etiology and patho-physiology is still poorly understood. No single therapeutic modality is best for all keloids (Butler et al., 2008; Trisliana Perdanasari et al., 2014).It needs prompt attention for relief. Various techniques had been tried in the past to find a possible solution to this puzzling state of keloids but none have provided dependable results.

The present study was aimed to compare the efficacy of intra-lesional injection of triamcinolone acetonide alone against cryotherapy followed by intra-lesional injection of triamcinolone acetonide. Both agents act on keloid in different ways, intra-lesional triamcinolone causes inhibition of protein synthesis and fibroblast migration. It also enhances degradation of collagen. Cryotherapy causes tissue necrosis by exposing the tissue to

extreme cold which leads to irreversible cell damage and vascular stasis which develops in tissue after thawing. Keloids more common in younger age because more chances of trauma.

In the present study, no correlation between clinical response and age, sex or duration of keloids was found. This was in line with that of Nanda and Reddy (2004) who observed no correlation between duration of keloid and response to treatment. Also, Naeini et al. (2006) found no correlation between location or duration of lesions and the therapeutic response. On the contrary, Kontochristopoulos et al. (2005) found correlation between duration of keloids and recurrence. He observed that the response was low in older lesions.

The combined treatment with triamcinolone and cryosurgery was found to be an effective treatment for flattening keloids. The results achieved were much better than triamcinolone injections alone. The present study also indicated that the cryosurgery alone cannot improve keloids. The observed results of our study were entirely different from other two recent prospective studies of Zouboulis et al., 1993 and Layton et al. 1994. A possible explanation for the differences in treatment outcome in our study may be related to the significantly longer duration of the keloids in the current study. More recent keloids, which are more vascular, may respond better to cryotherapy than lesions of longer duration Layton et al. 1994.

It was suggested that previous cryotherapy treatment failure was due to the impatience of the doctors and that often a keloid that has not responded to two to three treatments at monthly intervals will respond after four to five treatments Zouboulis et al., 1993. The present study does not sustenance this elucidation since the numbers of treatments with cryotherapy were relatively high. We also demonstrated that all treatments abolished the pain the patients had suffered regardless of flattening the lesions. Itch was significantly reduced with the corticosteroid injections and the combined treatment. However, cryotherapy alone did not alleviate itch.

It has been well known since the studies of Conway and Stark in 1952 that corticosteroids abolish the pain and itch associated with keloids. The addition of cryotherapy may augment the anti-pruritic effect of corticosteroids triamcinolone and cryotherapy is so effective in flattening keloid scars is as yet unclear. Keloidal tissue has increased collagen and glycosa aminoglycans synthesis due to increased deposition of alpha globulins, which are collagenase inhibitors. Corticosteroids reduce alpha globulins within the keloidal tissues and inhibit fibroblast growth, and this may account for their therapeutic efficacy (McCoy BJ et al. 1980). The addition of cryotherapy may augment the process by their microcirculatory damaging effect and tissue necrosis. It has been previously suggested that adding cryotherapy prior to triamcinolone injection is beneficial since it causes edema, which allows the triamcinolone to be injected more effectively. Our good response with the addition of cryotherapy after corticosteroid injection does not support this explanation.

VI. Conclusion

The present study conclude that the 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. In conclusion, regardless of the mechanism, combined injection of intralesional steroids with cryotherapy appears to be superior to other current modalities in the treatment of keloids with no significant side effects.

References

[1]. Hunasgi S., Koneru A., Vanishree M., Shamala R. Keloid: a case report and review of pathophysiology and differences between keloid and hypertrophic scars. J Oral Maxillofac Pathol. 2013;17:116–120. [PubMed]

[2]. Maghrabi, Ibrahim A, and Ahmed M Kabel. "Management of Keloids and Hypertrophic Scars: Role of Nutrition, Drugs, Cryotherapy and Phototherapy." World Journal of Nutrition and Health. 2014; 2.2 : 28-32. [PubMed]

[3]. 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. [PubMed]

[4]. Urioste S et al Keloids and hypertrophic scars: review and treatment strategies. Seminars in Cutaneous Medicine and Surgery.1999; 18 (2): 159-171. [PubMed]

[5]. Hirshowitz B, Lerner D, Moscana AR. Treatment of keloid scars by combined cryosurgery and intralesional corticosteroids. Aesth Plast Surg. 1982;6:153–8. [PubMed]

[6]. Zouboulis CC, Blume U, Buttner P, Orfanos CE. Outcomes of cryosurgery in keloids and hypertrophic scars. A perspective consecutive trial of case series. Arch Dermatol. 1993;129:1146–51. [PubMed]

[7]. Butler P.D., Longaker M.T.,Yang G.P. Current progress in keloid: research and treatment J. Am. Coll. Surg. 2008; 206: 731–741. [PubMed]

[8]. Perdanasari Trisliana A, Lazzeri D, Su W., Xi W, Zheng Z, Ke L et al, Recent developments in the use of intralesional injections keloid treatment. Arch. Plast. Surg.,2014; 41:. 620–629. [PubMed]

[9]. Nanda, S. and Reddy, B. S. N. , Intralesional 5-Fluorouracil as a Treatment Modality of Keloids. Dermatologic Surgery,2004; 30: 54–57. [PubMed]

[10]. Naeini FF, Najafian J, Ahmadpour K. Bleomycin tattooing as a promising therapeutic modality in large keloids and hypertrophic scars. Dermatol Surg. 2006;32:1023–1029. [PubMed]

[11]. Kontochristopoulos G, Stefanaki C, Panagiotopoulos A, et al. Intralesional 5-fluorouracil in the treatment of keloids: an open clinical and histopathologic study. J Am Acad Dermatol. 2005;52:474–479. [PubMed]

[12]. Layton AM, Yip J, Cunliffe WJ. A comparison of intralesional triamcinolone and cryosurgery in the treatment of acne keloids. Br J Dermatol. 1994;130:498–501. [PubMed]
[13]. Conway H. And Stark Richard B., Corticotropin (ACTH) in Treatment of keloids AMA Arch Surg. 1952;64(1):47-50. [PubMed]
[14]. McCoy , B. J., Diegelmann , R. F., and Cohen , I. K. In vitro inhibition of cell growth, collagen synthesis and prolyl hydroxylase activity by triamcinolone acetonide. Proc. Soc. Exp. Biol. Med. 163: 216, 1980. [PubMed]