



DESIRABILITY OF CRYOTHERAPY IN KELOIDS

Dermatology

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ABSTRACT

Introduction: There are many different types of treatments for keloids, but none works perfectly. Cryotherapy is relatively a promising technique which freezes the scar. So we are now presenting a study of cryotherapy on keloids where there are no restriction and limitations like other modalities of Intralesional steroids and surgical procedures.

Aims and objectives: To know the extent of usage of cryotherapy in keloids when compared to other treatment modalities.

Materials and methods: Source of data: A hospital based therapeutic study was conducted in Department of Dermatology, Venereology and Leprosy, ASRAM, Eluru, AP. 28 Patients were recruited from OPD and study was conducted from October 2018 to May 2019. Liquid nitrogen is used as a cryogen.

Results: Out of 28 cases, decrease in thickness and softening of keloids is observed in 12-16 weeks in about 22 cases (78.5%).

Conclusion: Cryotherapy is a relatively better technique when compared to other modalities like Intralesional steroids and other Surgical techniques which has more limitations and restrictions.

KEYWORDS

Cryotherapy, liquid nitrogen, keloids, intralesional steroids, surgical procedures

INTRODUCTION:

In predisposed individuals, injury of the skin can lead to an abnormal healing response, resulting in keloid scars.¹ Besides aesthetic disfigurement, keloids can cause major physical complaints of pain and pruritus, hence impairing the quality of life of the patient.² The treatment of keloids is a great challenge, as surgical excision alone results in high recurrence rates (>60%) and even growth stimulus following treatment.¹ To date, several treatment modalities exist, but not a single treatment option has proven widely effective.^{3,4} The effectiveness of silicone sheeting and pressure therapy remains limited.⁵ IL corticosteroids and 5-fluorouracil have proven successful in reducing pain and pruritus, as well as decreasing scar volume. However, several painful treatment sessions are required and recurrence rates remain high.⁴

Cryotherapy is a recent technique for the treatment of keloids offering a good replacable treatment modality between the current nonsurgical and surgical treatment options.⁹ For decades, liquid nitrogen has been applied externally to freeze and destruct keloids. However, numerous side effects, such as hypopigmentation, blistering, delayed healing, and infection, were reported.¹⁰

MATERIALS AND METHODS:

Source of data: A hospital based therapeutic study was conducted in Department of Dermatology, Venereology and Leprosy, ASRAM, Eluru, AP. 28 Patients were recruited from OPD and study was conducted from October 2018 to May 2019.

Liquid Nitrogen: One of the oldest cryogens that was used as liquid that boils at below -160c. It contains approximately 78% nitrogen, 21% oxygen, 1% argon and traces of other rare gases. Followed for about 12-16weeks.

By using a cryo gun, a cryogen can be applied directly over the scar as a direct spray. In this way, all the pathological tissue will be frozen and destructed, creating a new scar without keloidal characteristics.



Inclusion criteria:

1. Clinically diagnosed cases of keloids
2. All age groups and both genders included.

Exclusion criteria:

1. Patients treated for keloids prior to the study

Data collection: After obtaining informed consent, information was taken as per the proforma, enclosed, recorded on the clinical forms. Complete history regarding the onset, progression, associated conditions is included in the proforma.

Clinical examination: Inspection of all sites of body including face, upper limbs, lower limbs, trunk was done. The morphology of lesions, their distribution, sites of involvement were recorded.

RESULTS:

In our study, out of 28 cases,

- There is decrease in thickness and softening of lesions with areas of hypopigmentation and exfoliation in about 22 cases (78.5%) in 12-16weeks, among which 18 cases(81.2%) are with a duration of lesions <2years and 4 cases(18.8%)>2years
- There is no significant difference except a mild softening, exfoliation and areas of hypopigmentation in about 4 cases (14.5%) in 12-16weeks, all of which had a duration of lesions above 2 years.
- The lesions remained same except areas of hypopigmentation in about 2 cases (7%) all of which had duration of lesions above 2 years.
- Higher percentage flattening was observed in keloids lesser than 0.5cm thickness after 12-16weeks. The thickness did not have statistically significant correlation with percentage flattening after 4 sittings of cryotherapy.
- Side effects like variable hypopigmentation, exfoliation are seen in almost all cases, delayed healing is seen in few cases.



DISCUSSION:

In our study, it was observed that there was significantly more flattening in younger lesions noted after 12-16 weeks. Lesions less than 2 years duration i.e., younger lesions showed more faster improvement when compared to older lesions with more than 2 years. Lesions which were long standing had a relatively lesser response rate. It was also seen that younger lesions had early response with maximum flattening obtained in first 12 weeks, whereas older keloids with duration more than 2 years showed an initial slow response with maximum flattening being observed in the latter half of therapy. Layton *et al*¹⁰ found that keloids with a higher blood flow than the surrounding skin respond better to cryotherapy. He also observed that the more vascular keloids were also of relatively recent onset <12 months duration. Thus again suggesting that recent onset keloids respond better to cryotherapy.

The therapeutic effect of cryotherapy depends upon freezing-induced ischaemic damage to the microcirculation. Freezing induces vascular damage and circulatory stasis leading to anoxia and eventual necrosis. It is known that early scars are more vascular and this property may be responsible for higher responsiveness of young lesions.

In our study, higher percentage flattening was observed in keloids lesser than 0.6 cm (Groups A and B) thickness after 12-16 weeks. The thickness did not have statistically significant correlation with percentage flattening after 4 sittings of cryotherapy.

Studies by Sharma *et al*¹³ and Shepherd and Dawber¹⁴ also found that smaller lesions had a better treatment outcome. The cryo-spray technique involves freezing of the lesion from the surface, such that freezing to a depth of only 1-2 cm can be achieved¹⁵. The freezing induced by cryosurgery can be divided into a lethal zone (temperature lower than -22°C) and a recovery zone (temperature in the range -22 to 0°C). In surface cryosurgery, the major part of lethal zone falls on the surface epithelium and not in the deep dermis where major pathology resides. Therefore, the deep abnormal tissue and the critical demarcation line between normal and abnormal tissue may survive freezing as they fall into the recovery zone or unfrozen area. Thus surface cryosurgery in large keloids may not be very successful.

Indian study conducted to assess the result of cryotherapy by Sharma *et al*¹³ found excellent response in 43.3% patients, good result in 26.7% patients, fair and poor result in 16.7% and 13.3%, respectively. A better result in this study could be due to the fact that they included only small lesions with depth less than 0.5 cm and gave freeze-thaw cycle of 30 seconds each.

Lesional pigmentary abnormality (Hypopigmentation) was observed in almost all patients. This is a known side effect of cryotherapy when used in patients with darker skin phenotypes as the melanocytes are destroyed at much lower temperature (-4 to -8°C) than fibroblasts (-30 to -40°C)¹⁵

CONCLUSION:

Cryotherapy is a relatively better technique when compared to other modalities like Intralesional steroids and other Surgical techniques which has more limitations and restrictions. However, side effects, such as variable hypopigmentation, exfoliation and delayed healing can be seen.

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