

Cryotherapy for The Treatment of Acne Keloidalis (A Clinical Interventional Therapeutic Trial)

Ihsan A. Al-Turfy

ABSTRACT:

BACKGROUND:

Acne keloidalis is a condition characterized by follicular-based papules and pustules that form hypertrophic or keloid-like scars. It typically occurs on the occipital scalp and posterior neck and develops almost exclusively in young people with dark skin

Unlike true acne vulgaris, comedones are not seen. The condition has a great psychosocial impact. The exact etiology of AK is unclear. It is thought that chronic irritation from coarse, curly hairs in the skin leads to inflammation and development of these lesions. It has also been shown that men who have haircuts more frequently than once a month are at higher risk of developing acne keloidalis.

OBJECTIVE:

To assess the efficacy of liquid nitrogen cryotherapy for the treatment of acne keloidalis.

PATIENTS AND METHODS:

It is a clinical interventional therapeutic study done in the period from Jan 2010 till Dec 2012 in Al-Noor Hospital/ Alain City UAE

Twenty male patients with acne keloidalis were treated through several sessions of cryotherapy. Their ages ranged between 23 and 34 years with a mean of 28.2year +/- SD=3.93.

Patients were divided into three groups: mild, moderate, and severe.

RESULTS:

Group one (mild, every patient has less than 10 nodules): total no. of nodules was reduced from 75 to 26. t-test was done for this group with a p value=0.000026.

Group two (moderate, every patient has between 10 and 20 nodules): total no. of nodules was reduced from 86 to 34 with a p value = 0.00011.

Group three (severe, every patient has more than 20 nodules) : total no. of nodules was reduced from 59 to 38 with a p value =0.015.

Patients satisfaction was also done and 15 patients (75%) were satisfied.

CONCLUSION:

Cryotherapy was a good therapeutic option with mild side effects and acceptable patient satisfaction.

KEYWORDS :acne,keloid, cryotherapy .

INTRODUCTION:

Acne keloidalis (AK) is a condition characterized by follicular-based papules and pustules that form hypertrophic or keloid-like scars. AK typically occurs on the occipital scalp and posterior neck and develops almost exclusively in young people with dark skin.^(1,2)

Lesions initially manifest as mildly pruritic follicular-based papules and pustules on the nape of the neck. Chronic folliculitis ultimately leads to the development of keloid-like plaques. AK develops in hair bearing skin areas, and broken hair shafts,

tufted hairs, and ingrown hairs can be identified within and at the margins of the plaques themselves. Lesions can grow over time and become disfiguring and painful. In advanced cases, abscesses and sinus tracts with purulent discharge may develop. Unlike true acne vulgaris, comedones are not seen in AK. The condition has a great psychosocial impact^(1,2,3)

The exact etiology of AK is unclear. It is thought that chronic irritation from coarse, curly hair in the skin leads to inflammation and development of these lesions. This hypothesis is supported by the fact that close shaving and chronic rubbing of the area by clothing make AK worse⁽⁴⁾. It has also been shown that men who have haircuts more frequently than once a month are at higher risk of developing acne keloidalis nuchae.⁽³⁾

Department of Dermatology, College of
Medicine, University of Baghdad.

Education is the key to prevention. Patients need to be made aware that the condition is exacerbated by short haircuts and close shaving^(3,4). A variety of medications are used such as topical steroids, topical and systemic retinoids, systemic antibiotics, laser therapy, excision, intraregional, steroids, targeted ultraviolet B treatment, and cryotherapy. The aim of this study is to assess the efficacy of liquid nitrogen cryotherapy for the treatment of acne keloidalis.

PATIENTS AND METHODS:

This interventional therapeutic study was done in the period from Jan 2010 till Dec 2012 in Al-Noor Hospital / Alain city UAE.

Twenty male patients with acne keloidalis were included in the study. Their ages ranged between 23 and 34 years with a mean of 28.2year +/- SD=3.93

Duration of the disease ranged between one and six years with a mean of 2.65 year +/- SD =1.42 .All of them were treated previously by systemic doxycycline and topical potent steroids according to the previous records of the patients in the hospital.

Patients were divided into three groups depending on the number of nodules as follows:

Group one (every patient has less than 10 nodules): The total no. of nodules in this group was 75 with a mean of 6.25 +/- SD =1.9 . They were 12 patients .Their ages ranged between 23 years and 34 years with a mean of 27.8 +/- SD=4.1.

Group two (every patient has between 10-20 nodules): The total no. of nodules was 86 with a mean of 14.3 +/- SD =3.2. They were 6 patients. Their ages ranged between 23 years and 34 years with a mean of 27.1 +/- SD= 3.9.

Group three (every patient has more than 20 nodules) in whom total no. of nodules was 59 with a mean of 29.5 +/- SD = 3.5.They were 2 patients. Their ages were 26 and 29 with a mean of 27.5+/- SD=2.1.

New patients who were not using any medicine before were not included in this study.

Patients were treated by cryotherapy (liquid nitrogen spray).Every nodule was treated by three cycles of freezing and thawing. Each cycle has 3 phases: first spraying till freezing, second spraying for further 30 seconds and third thawing. No

anesthesia was used. Sessions were done every 2 weeks. No thermocouples were used but a temperature of—180 degrees centigrade is expected.

Monitoring the response to therapy was done at each session depending on:

1. Counting the number of nodules.
2. Determining patient satisfaction.

Treatment sessions were continued until improvement occurs as mentioned above.

Patient satisfaction was done at the end of this study (6 months after the last session) and as follows:

1. **Satisfied:** if the patient chooses numbers 9 or 10 of the scale.
2. **Partially satisfied:** if the patient chooses numbers 3-8.of the scale.
3. **Un satisfied:** if he chooses number. 1 or 2 of the scale.

No patient recorded recurrence after the end of follow up.

RESULTS:

Total number of sessions for all patients was 102.

Group one: total number of sessions was 46 with a mean of 3.8 and SD= 0.83.

Group two: total number. of sessions was 39 with a mean of 5.5 and SD = 1.04.

Group three: total number of sessions was 17 with a mean of 8.5+/-SD =0.7.

Follow up was carried out every month for 6 months (after stopping therapy) by visit exam, or through telephone assessment asking for satisfaction and any changes in the treated area.

Group one : Total number of nodules was reduced from 75 to 26 with a mean of 2.16+SD=0.577.ttest done for this group with a p value=0.0000026.

Group two: Total number of nodules was reduced from 86 to 34 with a mean of 5.66 +/- SD = 1.63 with a p value = 0.00011.

Group three: Total number of nodules was reduced from 59 to 38 with a mean of 19 +/- SD =2.82 with a p value =0.015.

(Table- 1).

Results according to patient satisfaction: by using a scale from 1 to 10 (10 is fully satisfied)-(table-2).

Side effects were mild and transient and they included pain, hypo pigmentation, oozing, erosion, and bloody discharge.

Table 1: Number of patients, number of nodules (total and mean number per patient), SD before and after treatment, and p-values according to patient groups

Group	Number of patients	Number of nodules(before treatment)		Number of nodules(after treatment)		p-value(t test)
		Total	Mean +/-SD	Total	Mean +/-SD	
one	12	75	6.25+/-1.91	26	2.16+/-0.57	0.000002
Two	6	86	14.3+/-3.2	34	5.66+/-1.63	0.00011
Three	2	59	29.5+/-3.53	38	19+/-2.82	0.015

Table 2: Patients satisfaction.

Patient satisfaction(score of 1-10) 10=fully satisfied	Number of patients
Satisfied (9 or 10)	9
Partially satisfied (3-8)	6
Unsatisfied(1or 2)	5

DISCUSSION:

Treatment of acne keloidalis is difficult and all patients included in this study had tried one or more treatment modality without response.

To the best of my knowledge this is the first study in which cryotherapy was used for the treatment of acne keloidalis.

The following methods were used to treat acne keloidalis:

Excision was used by Califano et al and he treated 5 patients and the result was fair to good(5),Glenn et al treated 6 patients by excision,4 showed good results(6),Gloster treated 25 patients by excision with excellent to good results (4).

Laser was used by Kantor when he used CO2 laser for 8 patients (7), and diode laser was used by Shah for two cases with 90-95% clearance after 4sessions(8),and Esmat et al used pulsed Nd-YAG laser for 16 patients and all patients showed significant improvement. (9)

Targeted UVB was used by Okoye et al for 11patients and they showed significant improvement of clinical appearance. (10)

Cryosurgery for keloids as a complication to acne(not acne keloidalis) was used in the study done by Layton et al. They treated 11 patients comparing the results of intralesional triamcinolone and cryosurgery and concluded that cryosurgery showed moderate to good response in 85% and was significantly better than intralesional triamcinolone especially in early cases (11).

In all these studies they did not mention whether patients have recurrences or not.

In the current study the response to cryotherapy was good in all patients with very significant p values in all groups and the number of patients is larger than most of the other studies.

The use of laser is very expensive. Excision and suture need either admission or have downtime and is more expensive. Targeted UVB needs a specialized center with certain precautions.

No patients' satisfaction was done in the mentioned studies, while in this study satisfaction was good in 75% of patients and if more sessions were done this satisfaction would have been more.

In this study there was no recurrence within the period of follow up.

CONCLUSION:

Cryotherapy is a good therapeutic option for acne keloidalis with satisfying results in most patients.

REFERENCES:

1. Mahé A. Treatment of acne keloidalis nuchae: recommendations. *Ann Dermatol Venereol.* 1999; 126:541-2 (ISSN: 0151-9638).
2. Vasily DB; Breen PC; Miller OF. Acne keloidalis nuchae: report and treatment of a severe case. *J Dermatol Surg Oncol.* 1979; 5:228-30 (ISSN: 0148-0812).
3. Shockman S; Paghdal KV; Cohen G. Medical and surgical management of keloids: a review. *J Drugs Dermatol.* 2010;9:1249-57. (ISSN: 1545-9616).
4. Gloster HM Jr. The surgical management of extensive cases of acne keloidalis nuchae. *Arch Dermatol.* Nov 2000;136:1376-79(ISSN:0003-987X).

5. Califano J; Miller S; Frodel J. Treatment of occipital acne keloidalis by excision followed by secondary intention healing. *Arch Facial Plast Surg.* 1999; 1:308-11. (ISSN: 1521-2491).
6. Glenn MJ; Bennett RG; Kelly AP. Acne keloidalis nuchae: Treatment with excision and second-intention healing. *J Acad Dermatol.* 1995;33:243-46 (ISSN:0190-9622).
7. Kantor GR; Ratz JL; Wheeland RG. Treatment of acne keloidalis nuchae with carbon dioxide laser. *J Am Acad Dermatol.* 1986;14:263-67 (ISSN: 0190-9622).
8. Shah GK. Efficacy of diode laser for treating acne keloidalis nuchae. *Indian J Dermatol Venereol Leprol.* 2005;71:31-34 (ISSN:0378-6323).
9. Esmat SM; Abdel Hay RM; Abu Zeid OM; Hosni HN. The efficacy of laser-assisted hair removal in the treatment of acne keloidalis nuchae; a pilot study. *Eur J Dermatol.* 2012;22:645-50 (ISSN:1952-4013).
10. Okoyo GA; Rainer BM; Leung SG; Sush HS; Kim JH; Nelson AM; Garza LA; Chien AL; Kang S. Improving acne keloidalis nuchae with targeted ultraviolet B treatment: a prospective, randomized, split-scalp comparison study. *Br J Dermatol.* 2014;171:1156-63. (ISSN:136-2133).
11. 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. (ISSN:007-0963).