ORIGINAL ARTICLE

Chemical Cautery with 100% TCA Versus $AgNO_3$ For the Treatment of Xanthelasma Palpebrum: A Randomized Controlled Trial

Lubna Rani Faysal,[1] Farid Ur Rehman[2]

ABSTRACT

Objective: To compare the efficacy of chemical cautery with 100% trichloroacetic acid (TCA) versus silver nitrate ($AgNO_3$) for the treatment of xanthelasma palpebrum.

Study Design: Randomized controlled trial (RCT).

Place and Duration of Study: Department of Dermatology, Pakistan Railway Hospital, Rawalpindi from 1st June 2016 to 31st December 2017.

Materials and Methods: A total of 40 adult patients with xanthelasma palpebrum were enrolled and randomly divided into two equal groups. In group A patients, chemical cautery was done with TCA 100% while group B patients were treated with AgNO3. Results were recorded after single session of treatment at 02 weeks for improvement/ clearing of lesion and at 03 months for post inflammatory hypopigmentation /hyperpigmentation and recurrence.

Results: In group A, 19 patients (95%) out of 20 showed 75 – 100% clearing two weeks after the single treatment session in comparison to 04 (20%) patients in Group B. And only 01 patient (5%) in group A showed 50-75% clearing as compared to group B where 16 patients showed this response. None of the patient showed less than 50% clearing in group A while 01 patient (5%) in group B had this response. At the end of 03 months, 20% and 5% patients developed post-inflammatory hypopigmentation in group A and group B respectively. No recurrence of lesion was reported during this period.

Conclusion: Chemical cautery for the treatment of Xanthelasma with 100% TCA gives better results than $AgNO_3$.

Key Words: *Chemical Cautery, Cryotherapy, Hyperlipidemia, Radiofrequency (RF), Trichloroacetic acid (TCA), Xanthelasma Palpebrum (XP).*

Introduction

Xanthelasma palpebrum (XP) is the commonest cutaneous xanthoma that develops around the eyes with the prevalence of roughly 1.1% in women and 0.3% in men.[1] Xanthomas are cholesterol-rich depositions that can appear anywhere in the body during various disease states. The term "xanthelasma" is derived from the Greek word xanthos (yellow) and elasma (beaten metal plate)[2] the age of onset ranges from 15 to 73 years, with a peak incidence between 30 and 50 years.[3]

Clinically Xanthelasma can be categorized into macular, flat plaques and papulonodular types. It is characterized by yellowish plaques occurring symmetrically distributed near the inner canthus of the eyelid, more often on the upper, rather than the lower lid. XP is composed of xanthoma cells or foam cells, histiocytes are laden with intracellular fat deposits, primarily located within the upper reticular dermis or in perivascular and periadnexal areas. Intrahistiocytic vacuoles contain esterified cholesterol.[4]

Xanthomas are usually associated with primary hyperlipidemias, especially types II and IV, having low high-density lipoprotein (HDL) levels, or secondary hyperlipidemias, such as hypothyroidism, diabetes mellitus. Drugs like glucocorticoids, cyclosporine, cimetidine, estrogens, some antihypertensive medications, retinoids, certain antiepileptic drugs, anabolic steroids and tamoxifen

[1]*Department of Dermatology*
Islamic International Medical College
Riphah International University, Islamabad
[2]*Department of Dermatology*
Foundation Medical College, Rawalpindi
Correspondence:
Dr. Lubna Rani Faysal
Assistant Professor
Department of Dermatology
Islamic International Medical College
Riphah International University, Islamabad
Email: lubna.rani@riphah.edu.pk

Funding Source: NIL; Conflict of Interest: NIL
Received: September 05, 2018; Revised: November 24, 2018
Accepted: November 25, 2018

are associated with secondary hyperlipidemia.[5] About 60% of patients have associated hypercholesterolemia. XP has also been reported following erythroderma, inflammatory skin disorders, and allergic contact dermatitis despite normal lipid profiles. XP can occur in normolipidemic persons with low HDL levels.[6]

It is essentially a benign condition; treatment is totally of cosmetic importance. In patients with XP who have associated lipid disorders, plasma lipid levels including triglycerides, cholesterol, low density lipoprotein and HDL, and apolipoprotein B100 levels should be assessed. Medical management involves lifestyle modifications such as regular physical exercise and low-fat diet in addition to lipid-lowering drugs. Although important in the overall care of a patient with abnormal lipids, medical management has a limited role in the treatment of XP.

Several treatment modalities are used to treat XP but none of them produces satisfactory results. These include simple surgical excision, cryotherapy, chemical cauterization with trichloroacetic acid (TCA), radiofrequency (RF), and laser treatment.[7] All modalities have their own advantages and disadvantages. Simple excision with or without blepharoplasty and medial epicanthoplasty can be conducted in grades I and II lesions, whereas, in advanced cases, uncapping surgery, local flaps, and skin grafts can be carried out. The commonest method of surgery is full-thickness skin excision[8] there are many disadvantages associated with surgery. There is always need of systemic or local anesthesia. It is often followed by slight scarring, ectropion and dyspigmentation.[9] Radiofrequency (RF) is considered to be an easy, safe, inexpensive, and effective treatment but facility is not available in all clinical setups. This technique has minimal impact on the surrounding tissues, making it appropriate for delicate areas with temporary side effects include pain, pruritus, burning, swelling, and erythema.[10] Similarly advantages of lasers include better acceptance, avoidance of surgery, minimal tissue loss, and good functional and cosmetic results. Moreover, the procedure is easy to perform and gives fast results but the main disadvantages are high cost and unpredictable results sometimes. In addition, it is not possible to obtain a histopathological specimen.[11,12]

TCA is an affordable and versatile treatment modality, particularly in our setup. It is a short, simple, and inexpensive procedure. It has been observed that 100% TCA gives the best results in papulonodular lesions, 100% or 70% TCA give similar results in flat plaque xanthelasma, and 50% TCA is sufficient in macular lesions.[13] Hypopigmentation is the commonest side effect, followed by hyperpigmentation, irritation, and pain. Scarring, atrophy, and Koebner-like phenomenon are other rare side effects.

There is not sufficient data available in literature on use of AgNO3 in treatment of xanthelasma but there is evidence of its use to debride hyper granulation tissue and calloused rolled up edges in wounds and ulcerations. It is a caustic material that oxidizes organic matter, coagulates tissue resulting into tissue death.[14] The objective of this study was to compare the efficacy of chemical cautery with 100% trichloroacetic acid (TCA) versus silver nitrate ($AgNO_3$) for treatment of xanthelasma palpebrum in order to emphasize the importance and efficacy of this simple and cost effective treatment modality in the era of modern energy devices where Laser & radiofrequency have almost replaced such modalities.[10,15]

Materials and Methods

This randomized controlled trial was conducted on outdoor patients visiting department of Dermatology, Pakistan Railway Teaching hospital, which is an affiliate of Islamic International Medical College, Rawalpindi. A total of 40 patients with diagnosis of Xanthelasma palpebrum, fulfilling inclusion criteria (age > 30 years, patients irrespective their lipidemic status, and absence of hypersensitivity) were enrolled for the study. The trial began after the permission from the hospital ethical review board and all the ethical issues were addressed. The disease was diagnosed on the basis of history and clinical examination. Informed written consent was taken from patients after detailed explanation. The patients were divided in two equal groups (20 in each) by computer generated randomization list. Group allocation was done to group A and group B

Patients allocated to group-A were treated with 100% TCA and patients in group-B were treated with

AgNO3 (supersaturated sol). The chemical was applied to the lesion with help of wooden stick cotton swab; size of swab was customized manually to the size of lesion. Before application of chemical, area was cleaned with normal saline. Swab was dipped into the chemical and applied to the lesion with rotatory movement from outside to center of the lesion. The surrounding skin was protected by application of white soft paraffine around the lesion to prevent damage to the normal skin from accidental spillage of chemical. The endpoint for TCA application was frosting of lesion and for $AgNO_3$ was charring /blackening of the lesion. All patients were given Fusidic acid 2%, which had to be applied over the treated area twice daily for 01 week after the treatment.

All the patients were evaluated objectively in clinic for improvement of lesion after 02 weeks of treatment session. The results were scored on a 0–4point following scale:

0 - No improvement

1 - Moderate result (<25% improvement)

2 - Satisfactory result (25%–50% improvement)

3 - Good result (50%–75% improvement

4 - Excellent result (>75% improvement)

Follow up visits were done at 03months interval for post-inflammatory hyper/ hypo-pigmentation& recurrence of lesion.

Data was entered and analyzed by statistical package for social sciences (SPSS) version 21. Quantitative data was calculated in the form of mean and standard deviation. Qualitative data was calculated in the form of frequencies and percentages. Chi-square test was used to compare the efficacy in two groups. A probability (p) value of less than 0.05 was considered statistically significant.

Results

A total 40 patients with xanthelasma palpebrum were enrolled in the study, with 20 in each group, A & B respectively. The overall mean age of study population was 47 years with age range of 32 years to 68 years. There was no significant difference in the mean age of study population between two groups. There were total 13 males and 27 female patients. Patients in group-A were treated with TCA chemical cautery and patients in group-B were treated with $AgNO_3$.

In group-A, 19 (95%) patients showed excellent results (75%-100% improvement) at 02 weeks of treatment, and 01(5%) patient showed this response in group-B. A total of 04 (20%) patients showed good result i.e.50-75% improvement in group-A and 15 (75%) patients in group-B had this response. Only 01 (5%) patient had less than 50% improvement in group-B. (Table-I)

The percentage of patients with excellent improvement was significantly higher in group-A as compared to group-B, P-value <0.000. (Table-II)

At the end of 03months follow up period, 04 (20%) patients in group-A had post-inflammatory hypopigmentation while 01 (5%) patient had it in group-B. (Figure-I). No recurrence of lesion was reported during this time.

Table I: Comparsion of Efficiency of Treatment in Group A & Group B

Treatment Groups	Efficacy						Total (n)
	Less than 50%	%	50-75% response	%	75-100% response	%	
Group A	0	0%	1	5%	19	95%	20
Group B	1	5%	15	75%	4	20%	20
Total	1	5%	16	80%	23	58%	40

Table II: Chi- Squar Test Showing Significant Difference

	Value	Df	Asym.Sig. (2-sided)
Pearson Chi-Square	23.033	2	0.000
Likelihood Ratio	26.717	2	0.000
Linear-by-Linear Associate	20.975	1	0.000
N of valid Case	40		
A.2 cells (33.3%) have expected count less than 5			

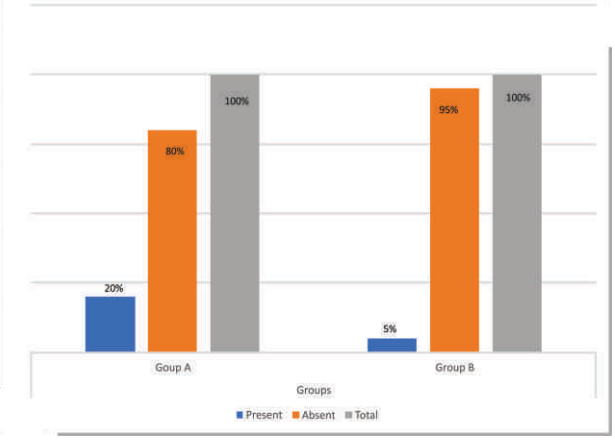

Fig 1: Comparison of Post Inflammatory Hypopigmentation In Both Groups

Discussion

The present study clearly shows the superior efficacy of TCA chemical cautery in treatment of xanthelasma palpebrum as compared to AgNO3. More than 90%

patients achieved excellent results at 02 week after a single treatment session with TCA 100% while the corresponding figure is very low, only 5% in group B.

In a retrospective review of 102 patients treated with TCA 95% for XP conducted by Cannon PS, et al. patient's outcome at 03 months and 12 months of treatment for recurrence/ persistence of the lesion showed high patient satisfaction. Overall, the success rate for TCA was 61% at a mean follow-up of 31.8 months[16] the mean number of TCA treatments was 1.68. Out of 44 reviewed in the clinic, there were 09 persistent lesions and 04 recurrences. Of 51 patients contacted by telephonic interview, 22 patients had experienced a recurrence, 09 patients had persistence of the lesion and 3 patients undergone surgical excision of the lesion since the last TCA treatment.

In our study, > 90% patients achieved excellent results with 100% TCA application and no persistence of lesion was recorded at 03 months follow up but to report for the recurrence, a longer follow up will be required.

The results of various prospective treatment trials with different strengths of TCA, 70% and 50% have shown its efficacy, satisfactory cosmetic result and acceptable recurrence rate.[13,17] But lowering the strength, increases average number of applications of chemical to achieve the desired result and hence the after effects of treatment like post-inflammatory hypo/ hyperpigmentation and scarring also get increased. Atrophy and a Koebner-like phenomenon has also been reported with repeated TCA applications.[18]

In our study only 04 patients reported with post inflammatory hypopigmentation at 03 months follow up, while no scarring, atrophy and koebnerization has been observed during follow up period. Hence higher concentration of TCA is more efficacious with better cosmetic results. It also prevents the repeated applications of TCA.

There is limited data available in literature on use of AgNO3 in treatment of xanthelasma but there is evidence of its use in treatment of XP.[14] In our study AgNO3 showed good results, 15 patients (75%) showed 50-75% clearing of lesion in single treatment while 4 (20%) had excellent results. It is relatively less efficacious than TCA and has comparatively less post-treatment pigmentary changes (5% in group-B vs 20% in group-A). But the requirement of repeated applications of $AgNO_3$ to achieve complete clearance of the lesion may lead to more post-treatment pigmentary changes and scarring compared to TCA100%. Hence further research with $AgNO_3$ in future will be required with longer follow up duration.

Conclusion

Chemical cautery with 100% TCA is more effective than AgNO3 and it is strongly recommended for treatment of Xanthelasma palpebrum.

REFERENCES

1. Jonsson A, Sigfiisson N. Significance of xanthelasma palpebrarum in the normal population. Lancet. 1976; 76:372.
2. Segal P, Insull W Jr, Chambless LE, Stinnett S, LaRosa JC, Weissfeld L, et al.The association of dyslipoproteinemia with corneal arcus and xanthelasma.The Lipid Research Clinics Program Prevalence Study. Circulation. 1986; 73(2): 108 -18.
3. Pathania V, Chatterjee M. Ultrapulse carbon dioxide laser ablation of xanthelasma palpebrarum: a case series. J Cutan Aesthet Surg. 2015; 8(1):46–49.
4. Martinez-Rovira GR. Xanthelasma in association with hyperthyroidism. JAMA. 1968;206(5):1081–3.
5. Gangopadhyay DN, Dey SK, Chandra M, Pal D, Chaudhary S. Serum lipid profile in xanthelasma. Indian J Dermatol. 1998; 43:53–56.
6. Raulin C, Schoenermark MP, Werner S, Greve B. Xanthelasma palpebrarum: treatment with the ultrapulsed CO2 laser. Lasers Surg Med. 1999;24(2):122–7.
7. Rohrich RJ, Janis JE, Pownell PH. Xanthelasma palpebrarum: a review and current management principles. Plast Reconstr Surg. 2002; 110(5):1310- 13.
8. 12. Mittelviefhaus H, Kreusser C, Bohringer D, Auw-Hädrich C. The underestimated depth of tissue invasion of xanthelasma: a histological study. Klin Monbl Augenheilkd. 2011; 228(1):14–18.
9. Eedy DJ. Treatment of xanthelasma by excision with secondary intention healing. Clin Exp Dermatol. 1996;21(4):273–5.
10. Mehmet Akdag. The effects of radiofrequency in xanthelasma of eyelid: case report. J Int Dent Med Res. 2013;6:128–31.
11. Karsai S, Schmitt L, Raulin C. Is Q-switched neodymium-doped yttrium aluminium garnet laser an effective approach to treat xanthelasma palpebrarum? Results from a clinical study of 76 cases. Dermatol Surg. 2009; 35(12):1962–9.
12. Fusade T. Treatment of xanthelasma palpebrarum by 1064-nmQ-switched Nd: YAG laser: a study of 11 cases. Br J Dermatol. 2008; 158(1):84–87.
13. Haque MU, Ramesh V. Evaluation of three different strengths of trichloroacetic acid in xanthelasma palpebrarum. J Dermatolog Treat. 2006; 17(1):48–50.

14. Widgerow AD, Leak K. Hypergranulation tissue: evolution, control and potential elimination. Wound Healing Southern Africa. 2010;3(2):1-3.
15. Gungor S, Canat D, Gokdemir G. Erbium: YAG laser ablation versus 70% trichloroacetıc acid application in the treatment of xanthelasma palpebrarum. Journal of dermatologic treatment. 2014; 25(4). 12
16. Cannon P. S, Ajit R, Leatherbow B Efficacy of trichloroacetic acid (95%) in the management of xanthelasma palpebraum. J clinical and experimental Dermatology. 2010; 35(8): 845-848
17. NahasTR, Marques JC, Nicoletti A, Cunha M, Nishiwaki-Dantas MC, Filho JV. Treatment of eyelid xanthelasma with 70% trichloroacetic acid. Journal of Ophthal Plast Reconstr Surg. 2009;25 (4): 280-3
18. Akhyani M, Daneshpazhooh M, Jafari A K, Naraghi, Z S, Farahani, F, Toosi, Siavash. Koebner phenomenon in xanthelasma after treatment with trichloroacetic acid. Dermatology online journal 2006; 12 (2).