ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 06 | June - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A COMPARATIVE STUDY OF THE EFFICACY OF TOPICAL STEROID VS TOPICAL DIMETHYLSULFOXIDE 70% IN TREATMENT OF CUTANEOUS MACULAR AMYLOIDOSIS

Dermatology

Nikita Jakhar* Department of Dermatology,Venereology and Leprology, Dr. Sampurnanand Medical College, Jodhpur, Rajasthan, India. *Corresponding Author

Komal Dabla Department of Dermatology,Venereology and Leprology, Dr. Sampurnanand Medical College, Jodhpur, Rajasthan, India.

ABSTRACT

Background: Amyloidosis refers to extracellular deposition of insoluble abnormal fibrils derived from aggregation of misfolded proteins. Specific aetiology unknown, cutaneous amyloidosis is considered to be multifactorial in origin and treatment remains a therapeutic challenge. **Aims and objectives:** To compare the efficacy of topical steroid and topical dimethylsulfoxide (DMSO) 70% in cutaneous macular amyloidosis in relation to –**1**. Improvement in pruritus and pigmentation. **2** .Adverse events if any. **Material and methods:** study was done in outpatient department of skin till the desired sample size was achieved. A total of 60 cases were enrolled as per inclusion criteria .The cases were diagnosed clinically and confirmed histologically. **Statistical analyses:** Categorical variables were assessed by using Chi square test. **Results:** Complete remission of pruritus was seen in 44 patients (78.57%) with DMSO 70% and 48 patients (85.71%) with steroid. 19 patients (33.92%) with DMSO 70% and 24 patients (42.85%) with steroids showed grade II improvement in pigmentation at the end of 3 months. The value was statistically insignificant (p value>0.05). **Conclusion:** topical steroid and DMSO showed comparable efficacy on pruritus and pigmentation improvement. For itch control, steroids can be used for short periods and DMSO appeared to be safe for long term. Both drugs proved to be unsatisfactory for cosmetic purpose.

KEYWORDS

cutaneous amyloidosis, dimethylsulfoxide, pruritus, pigmentation.

INTRODUCTION

Amyloidosis refers to extracellular deposition of insoluble abnormal fibrils derived from aggregation of misfolded proteins known to arise from many different proteins and exhibit characteristic staining properties, including apple green birefringence of Congo red stained preparations viewed under polarized light with fibrillar ultra-structure[1]

Primary Localised Cutaneous Amyloidosis refers to deposition of amyloid in apparantly normal skin with no deposition in internal organs. [2] It can be classified into three categories:

- Macular Amyloidosis
- Papular Amyloidosis
- Nodular Amyloidosis.

Specific aetiology being unknown, PLCA is considered to be multifactorial in origin; frictional damage, apoptosis, viral infections, autosomal dominant pattern of inheritance with Oncostatin M Receptor mutation (OSMR) observed in various studies. [3] Various treatment modalities have been tried with varied success [4]. Anti-inflammatory activity of topical steroids and membrane penetrating effect, anti-inflammatory, mast cell stabilising, OH^- binding anti oxidant effects of DMSO play role in topical effectiveness in cutaneous amyloidosis. [5,6]

This study endeavours to compare efficacy of existing treatment modalities – topical steroid and DMSO 70% in reducing pruritus and pigmentation in course of 3 months in Primary localised macular amyloidosis.

MATERIALS AND METHODS

Study was conducted on 60 patients attending OPD of skin department till the desired sample size was achieved. Patients were selected in the study by applying the following inclusion and exclusion criteria.

INCLUSION CRITERIA

1. Patients of both sexes with age groups between 15-65 years who were clinically diagnosed as bilateral macular amyloidosis with histological confirmation and did not receive any treatment previously.

EXCLUSION CRITERIA

1. Pregnant and lactating women.
2. Patients with systemic amyloidosis.
3. Patients with lichen, biphasic, nodular amyloidosis.
4. Patients with systemic diseases or using of systemic drugs that can be associated with hyper pigmentation.
5. Contact allergy to either of the drug.
6. All non symmetrical cases.
7. Patients with unrealistic expectations.

All patients who fulfilled the inclusion criteria were counselled regarding the study and informed consent was taken from them. A detailed history regarding duration, onset, occupation, progression, provoking factors, photo exposure, associated cutaneous and systemic disease, family history, past similar complaints, habit of scratching and rubbing the area by different scrubs was recorded.

Detailed cutaneous examination was done noting morphology, distribution, site, type of lesion. Patients with pruritic, brownish, rippled or reticulate hyper pigmented, macular lesions were classified clinically as 'macular amyloidosis'.

Confirmation of diagnosis was done by a histopathological examination of the biopsy specimen from the suspected lesion with a 5 mm punch after obtaining a consent followed by H&E and Congo red staining for amyloid deposits. Ethical clearance was obtained from the ethical committee of the college.

Patients received DMSO lotion of 70% strength and topical steroid cream (betamethasone di propionate (0.05%w/w)) and were observed for 3 months for decrease in pruritus and pigmentation. As a standard protocol, DMSO 70% lotion was applied on the lesion at the right side of the involved site of body and amyloid lesion on left side of involved part of body was treated with betamethasone dipropionate (0.05%) cream. Drugs were applied once daily for 3 months. Patients were not prescribed any antihistaminics during study period and were asked for photoprotection and to avoid the use of scrubbers in habitual patients.

All patients were followed at 2, 4,8,12 weeks during the treatment period. Patients would visit the hospital five times during the study period, first baseline visit then at two weeks and then three visits at the end of four weeks, eight weeks and twelve weeks for the total treatment period of three months.

Using 8 MP primary cameras with an f/2.4 aperture photographs were taken under consistent background, position and lightning and were compared with pre -treatment images.

Side effects and clinical response were recorded on every visit. Clinical assessment was based on improvement in efficacy parameters: Itching and pigmentation.

Results were formulated based on treatment response.
Excellent response = Itching resolved completely and marked improvement in pigmentation.

Partial response = Itching and pigmentation reduced but not completely resolved.

No response = no improvement in itching and pigmentation.

Patients who completed the treatment were to be biopsied for histological examination after obtaining their consent. Only 26 patients provided their consent and were biopsied.

Data was compiled using Microsoft Excel. Categorical variables were assessed by using Chi square test. p value <0.05 was taken as statistically significant. Statistical analysis was done using statistical software (SPSS).

RESULTS

The study was conducted on 60 patients of macular amyloidosis. The cases were diagnosed clinically and confirmed histologically. The patients received betamethasone cream (0.05%w/w) and DMSO lotion 70% which were to be applied on the lesion on left and right side of body respectively as a set protocol for the period of three months. Patients were instructed for photo protection and to avoid use of scrubbers during bath. Four patients were lost to follow up for unknown reasons.

Following observations were made during the study:

Table 1: Patients Response At 4 Weeks

Response	Pruritus				Pigmentation			
	DMSO		Steroid		DMSO		Steroid	
	No.	%	No.	%	No.	%	No.	%
Excellent	30	53.57	37	66.07	0	0	0	0
Partial	17	30.35	12	21.42	3	5.35		3.57
No response	9	16.07	5	8.92	53	94.64	54	96.42
Total	56	100	56	100	56	100	56	100
χ2; p value	=2.701; p value = 0.259				= 2.093; p value = 0.647			

Table 2: Patients Response At 8 Weeks

Response	Pruritus				Pigmentation			
	DMSO		Steroid		DMSO		Steroid	
	No.	%	No.	%	No.	%	No.	%
Excellent	38	67.85	44	78.57	0	0	0	0
Partial	12	21.42	10	17.85	9	16.07	11	19.64
No response	6	10.71	2	3.57	47	83.92	45	80.35
Total	56	100	56	100	56	100	56	100
χ2; p value	2.621; 0.269				0.2435; 0.6217			

Table 3: Patients Response At 12 Weeks

Response	Pruritus				Pigmentation			
	DMSO		Steroid		DMSO		Steroid	
	No.	%	No.	%	No.	%	No.	%
Excellent	44	78.57	48	85.71	00	0	0	0
Partial	8	14.28	6	10.71	19	33.92	24	42.85
No response	4	7.14	2	3.57	37	66.07	32	57.14
Total	56	100	56	100	56	100	56	100
χ2; p value	1.126; 0.5694				0.9437; 0.3313			

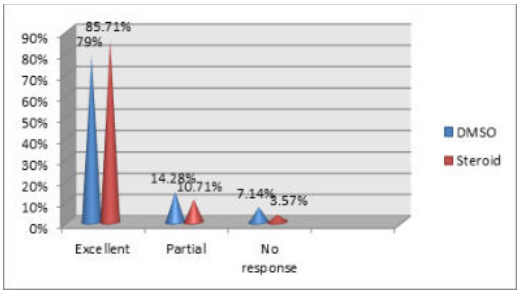


Figure 1: Response On Pruritus At 12 Weeks

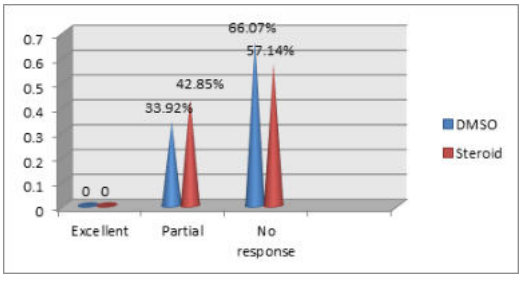


Figure 2: Response On Pigmentation At 12 Weeks

Table 2: Comparision Of Side Effect Profile

Side effect		DMSO		Steroid	
		No.	%	No.	%
Immediate/ early	Erythema	3	5.35	0	0
	Burning sensation	8	14.28	0	0
	Desquamation	1	1.78	0	0
	Xerosis	0	0	1	1.78
Long term	Atrophy (thinning of skin, telengiectasia)	0	0	3	5.35
	Acneform eruptions	0	0	4	7.14
χ2; p value		20; 001250			

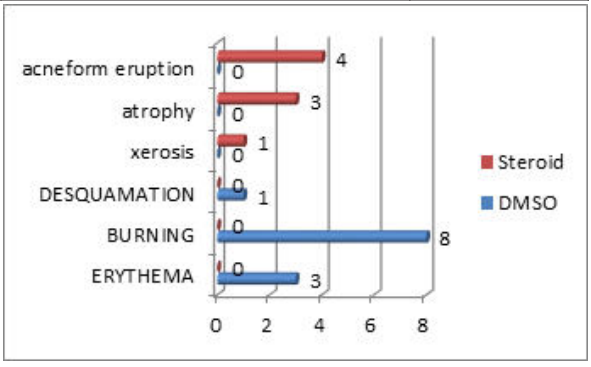
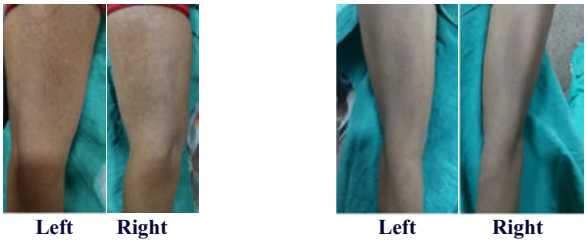


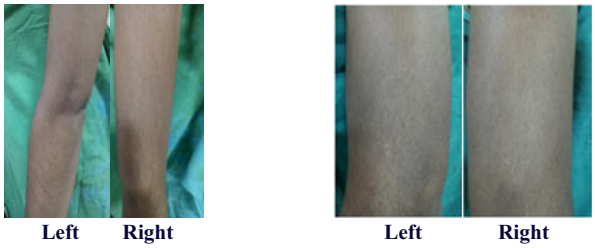
Figure 3: Comparision Of Side Effect Profile



Left Right Left Right

Pre treatment Post treatment

Figure 4: Grade II improvement in pigmentation in left hand with steroid



Left Right Left Right

Pre treatment Post treatment

Figure 5: Grade II improvement in pigmentation in right hand with DMSO

Figure 6: Grade I improvement in pigmentation in right hand with DMSO and Grade II improvement in pigmentation with steroid in left hand

DISCUSSION

The tendency of cutaneous amyloidosis to show disappointing results with the treatment is widely acknowledged.

Topical steroid with or without occlusion or intralesional steroids can be attempted in cutaneous amyloidosis.[7] In literatures, topical DMSO has been described to produce equivocal response in cutaneous amyloidosis.[8,9,10,11,12]

Ozkaya -Bayazit E et al. documented marked clinical improvement in 9 out of 10 patients at the end of 6-20 weeks with 50% DMSO solution in water. [8] Tayyaba Iqbal et al. reported complete resolution of pruritus in 49 patients (98%) with moderate pruritus in 1 patient (2%) and pigmentation resolution in only 4 patients (8%) with 50% DMSO in their study on 50 patients of macular amyloidosis treated for the period of 3 months. [9]

In contrast, in our study conducted on 56 patients with 70% DMSO, complete remission of pruritus (grade 0) was achieved in 44 patients (78.57) and grade II (25-50%) improvement in pigmentation was reported in 2 patients (3.57%).

Ozkaya- Bayazit E et al. studied the intermittent use of topical DMSO 50% or 100% solution in 13 patients of cutaneous amyloidosis and found that pruritus disappeared in 4.1 weeks and pigmentation resolved upto 50% after 6.5 months of therapy. [10]

Complete remission from itching was seen in 71% cases and disappearance of pigmentation totally in 31.5% in a study conducted by Arvind Krishna et al. with 100% DMSO [11]

Pandhi et al and Lim et al inferred unsatisfactory treatment with DMSO in cutaneous amyloidosis. [12,13]

In our study, results with regard to response to treatment with 70% DMSO were slightly greater than study of Pandhi et al. but non concordant with the other studies.

With steroid application, complete remission of pruritus (grade 0) was achieved in 48 patients (85.71%) and grade II (25-50%) improvement in pigmentation was reported in 4 patients (7.14%). There was no statistically significant difference (p value >.05) in response of steroid and DMSO on pruritus and pigmentation.

Side effects of topical DMSO were as reported in other studies, [11] erythema, desquamation, burning. Contact urticaria, garlic odour not observed in this study. With steroids, thinning of the skin with telengiectasia, acneform eruptions, dryness of the affected area were observed.

Histological examination showed amyloid deposits in patients treated with steroid and DMSO. This finding was in accordance with the other studies. [8,10,11]

Relapses have been reported in other studies. [14]Albeit patients were not followed for longer duration to record relapse, majority of them returned to skin opd and were reported to manifest the symptoms few days after ceasing the treatment. This suggests that response to both drugs is transient and short as per other studies. This could be explained by persistence of amyloid in the dermis.

CONCLUSION

Topical steroid and DMSO has comparable efficacy on pruritus and pigmentation improvement in macular amyloidosis. Topical steroid showed superiority over topical DMSO in terms of early side effect profile which was statistically significant (p value<0.05). DMSO appeared to be a safer drug for the longer period use for pruritus control avoiding unwanted steroidal side effects .Locally applied DMSO and steroid expected to break itch-scratch-amyloid deposition- itch cycle and itch-scratch-pigmentation cycle in patients with macular amyloidosis. Hence, topical steroid can be considered for short periods to control itching. Both steroid and DMSO are unsatisfactory for cosmetic concern in macular amyloidosis.

ABBREVATIONS

DMSO - Dimethylsulfoxide
PLCA - Primary Localised Cutaneous Amyloidosis

REFERENCES

1. Lachmann HJ, Hawkins DN. Amyloidosis and the skin. In: Woff K, Goldsmith LA, Katz SI, Gilchrist BA, Paller AS, Lefell DJ,eds. Fitzpatrick's Dermatology in General Medicine: 6th edn.Vol2, Mc Graw Hill.2008.p.1257-1264.
2. Breathnach SM. Amyloid and Amyloidosis of skin. In: Burrns T. Breathnach , Cox N, Griffiths C, eds. Rook's Textbook of Dermatology: 7th edn. Vol 3, Oxford: Blackwell Science.2003.p.57.36-57.51.
3. Lin MW, Lee DD, Liu TT, Lin YF, Chen SY, Huang CC, Weng HY, Liu YF, Tanaka A, Arita K, Lai-Cheong J, Palisson F, Chang YT, Wong CK, Matsuura I, McGrath JA, Tsai SF . Novel IL31RA gene mutation and ancestral OSMR mutant allele in familial primary cutaneous amyloidosis. Eur J Hum Genet. 2010 Jan; 18(1):26-32.
4. Wong CK. Cutaneous Amyloidosis. Int J Dermatol.1987; 26(5):273-277.
5. Reynolds JEF, Martindale.The extra pharmacopoeia' 30th ed. London. The pharmacoceutical press, 1993; 1101-02.
6. Yvette A., Tivoli, DO and Richard M. Rubenstein, MD. Pruritus – an updated look at an old problem. J Clin Aesthet Dermatol. 2009 Jul; 2(7): 30-36.
7. Rasi A, Khatami A, Juvaheri SM. Macular amyloidosis: An assessment of prevalence, sex and age. Int J Dermatol.2004; 43:898-899.
8. Ozkaya-Bayazit E, Baykal C, Kavak A.Local DMSO treatment of macular and papular amyloidosis.Hautrazt.1997; 48(1):31-37.
9. Tayyaba Iqbal, Naseema Kapadia, Saher Ather, Sadia Iqbal, Maria Mansoor, Shahmoona Faisal, Nadia Farooq, Feroza Fatima. Efficacy of topical DMSO in Macular amyloidosis. Rewal Medical Journal: Vol.42.No.1, Jan-Mar.2017.
10. Ozkaya-Bayazit E, Kavak A., Gungor H, Ozarmagam G. Intermitent use of topical dimethylsulfoxide in macular and papular amyloidosis Int J Dermatol 1998;37: 949-54.
11. Krishna A, Nath B, Dhir G, Kumari R, Budhiraja V, Singh K. Study on epidemiology of cutaneous amyloidosis in northern india and effectiveness of dimethylsulfoxide in cutaneous amyloidosis.Indian Dermatol Online J 2012;3:182-6.
12. Pandhi R; Kaur I; Kumar. Lack of effect of dimethylsulfoxide in cutaneous amyloidosis. BJ Dermatolog Treat. 2002; 13(1):11-4
13. Lim KB, Tan SH, Tan KT.Lack of effect of dimethylsulfoxide (DMSO) on amyloid deposits in lichen amyloidosis. Br J Dermatol.1988; 119(3): 409-10.
14. Braun Falco O, Plewig G, Wolff HH, Burgdorf WHC. Amyloidosis. In: Ibidem. Dermatology. Second, completely revised edition. Berlin: Springer- Verlag; 2000.pp.1278-88.