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# Safety and Efficacy of Dexamethasone Cyclophosphamide Pulse Therapy in Systemic Sclerosis: a Retrospective Study in a Tertiary Care Centre In Jharkhand

Dr.ShrutiSuman[1], Dr.Prof S.S. Chaudhary[2],
Dr. Shribhagawan Rolaniya[3]

***1.****Junior Resident Academic, Department of Dermatology,Venereology and Leprosy,Rajendra Institute of Medical Sciences,Ranchi,Jharkhand*
***2.****Professor and Head of the Department,Department of Dermatology,Venereology and Leprosy,Rajendra Institute of Medical Sciences,Ranchi,Jharkhand*
***3.****Junior Resident Academic, Department of Dermatology,Venereology and Leprosy,Rajendra Institute of Medical Sciences,Ranchi,Jharkhand*
*Corresponding Author: Dr. Shribhagawan Rolaniya*

***Abstract:*** *The treament of systemic sclerosis has been far from satisfactory.This study aims at determining the safety and efficacy of Dexamethasone Cyclophosphamide Pulse for the treatment of systemic sclerosis.20 patients of systemic sclerosis who have undergone or are undergoing the treatment of Dexamethasone Cyclophosphamide Pulse therapy in our department were evaluated for improvement and side effects of the therapy. Patients were evaluated at baseline,after 6 cycles and after 12 cycles.*

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## I. Introduction

Systemic sclerosis is a multisystem disorder characterised by vasculopathy,skin sclerosis and visceral organ involvement.The treatment of systemic sclerosis has been far from satisfactory and no single drug has shown consistent benefit in this disease.[1]Dexamethasone Cyclophosphamide Pulse therapy is an accepted modality of treatment for many autoimmune diseases. Pulse therapy refers to administration of suprapharmacological doses of drugs in an intermittent manner at regular intervals to enhance therapeutic effect and to reduce side effects.[2-4]. Pasrichaet.al reported improvement in Indian patients of systemic sclerosis with DCP therapy.[5]The mechanism of action of DCP are as follows:

a) Dexamethasone Pulse causes decrease in CD4 T cells that recover in 7 days without significant effect on B cells

b)Intravenous pulse of Cyclophosphamide causes maximum suppression of B lymphocytes and moderate suppression of T lymphocytes and NK cells which takes 2-4 months to recover

## II. Aim And Objective

To determine the efficacy and safety of Dexamethasone Cyclophosphamide Pulse in Systemic Sclerosis

## III. Materials And Methods

20 patients of Systemic sclerosis who have undergone or are undergoing (completed atleast 12 cycles of DCP) in our department were selected. All patients were hospitalised at the initiation of therapy and baseline pretreatment investigations were done. Investigations include blood sugar, complete blood count, liver and kidney function tests ,serum electrolytes, routine examination of urine, virology. Thorough clinical evaluation was done and pulse,temperature,blood pressure were noted.100mg of dexamethasone in 500 ml of 5% dextrose was given by slow iv infusion over 2-3 hrs for 3 consecutive days every 28 days.500 mg of cyclophosphamide was added to the same solution on 2nd day of each cycle.[6]Patients received Inj pantoprazole iv od in empty stomach on all 3 days and on the 2nd day 500ml NS was given by rapid infusion after the pulse to prevent haemorrhagic cystitis.In between the pulses patients were given Nifedipine and Cyclophosphamide depending upon the severity of the symptoms.During infusion pulse,blood pressure and temperature monitoring was done every 30 mins.Serum electrolyte and blood sugar was evaluated on the day after the pulse was infused.Effect of therapy was determined by:

a)evaluating MRSS score before starting DCP,after 6 cycles and after 12 cycles

b)assesing improvement in clinical features of the patient:
Raynaud's phenomenon,breathlessness,digital ulcerations,extent and severity of skin tightening, dysphagia and mouth opening.
Improvement in clinical features was asessed on likert scale.

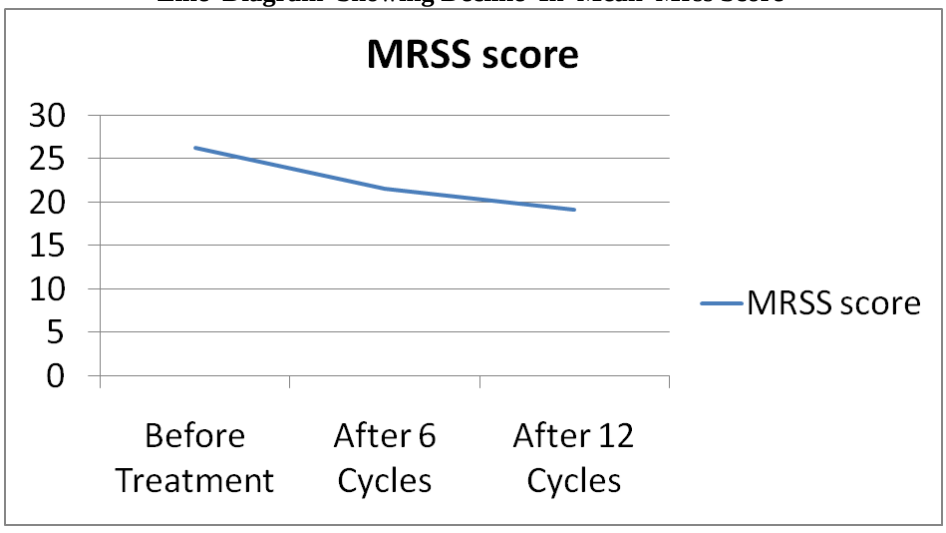
## IV. Results

Out of 20 patients enrolled in the study, 8 patients have completed the therapy while 12 are still undergoing the pulse therapy. The Modified rodnan skin score at baseline,after 6 months and after 12 months has been shown in the following table:

## V. Mrss Score

| *S.No.* | *AT BASELINE* | *AFTER 6 MONTHS* | *AFTER 12 MONTHS* |
|---|---|---|---|
| 1. | 40 | 33 | 30 |
| 2. | 27 | 25 | 21 |
| 3. | 31 | 28 | 21 |
| 4. | 22 | 17 | 15 |
| 5. | 16 | 10 | 7 |
| 6. | 27 | 22 | 20 |
| 7. | 21 | 17 | 14 |
| 8. | 15 | 9 | 6 |
| 9. | 36 | 30 | 28 |
| 10. | 23 | 16 | 14 |
| 11. | 29 | 24 | 23 |
| 12. | 39 | 32 | 30 |
| 13. | 22 | 18 | 18 |
| 14. | 26 | 20 | 19 |
| 15. | 26 | 21 | 18 |
| 16. | 25 | 21 | 20 |
| 17. | 22 | 17 | 16 |
| 18. | 23 | 21 | 19 |
| 19. | 25 | 23 | 21 |
| 20. | 31 | 27 | 25 |

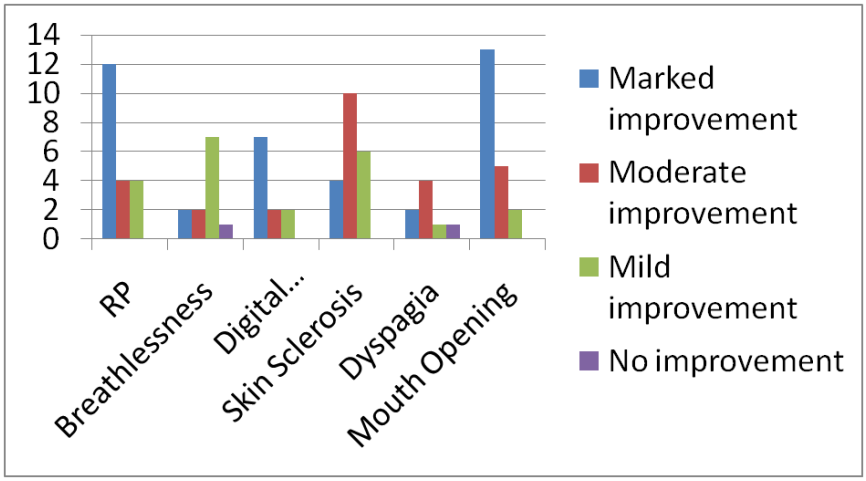
**Line Diagram Showing Decline In Mean Mrss Score**




**Improvement In Clinical Features**

| | *MARKED IMPROVEMENT* | *MODERATE IMPROVEMENT* | *MILD IMPROVEMENT* | *NO IMPROVEMENT* |
|---|---|---|---|---|
| ***Raynauds phenomenon*** | 12 | 4 | 4 | 0 |
| ***Breathlessness*** | 2 | 2 | 8 | 0 |
| ***Digital ulcerations*** | 7 | 2 | 2 | 0 |
| ***Extent and severity of skin sclerosis*** | 4 | 10 | 6 | 0 |
| ***Mouth opening*** | 13 | 5 | 2 | 0 |
| ***Dysphagia*** | 2 | 5 | 2 | 0 |

***BAR DIAGRAM SHOWING IMPROVEMENT IN CLINICAL FEATURES***




Out of 20 patients enrolled on the study all 20 were females. Age range was from 35 yrs to 50 yrs. All females had completed their family. Duration of Raynaud's phenomenon ranged from 6 months to 11 years in patients. Duration of skin tightening ranged from 6 months -9 years. Severity of skin sclerosis was varying and the range of MRSS score was from 15 -40 out of 51.

The results attained in the patients are discussed as under:

1)**Raynaud's phenomenon**: Out of all 20 patients who has symptoms of Raynaud's phenomenon at the beginning of therapy , 12 showed marked improvement, 4 showed moderate improvement and 4 showed mild improvement.

2)**Breathlessness:** 12 patients had complain of breathlessness at the beginning of treatment. Out of them , 2 showed marked improvement, 2 showed moderate improvement and 8 showed mild improvement.

3)**Digital ulcerations:** A marked improvement was seen in 7 patients, moderate improvement in 2 patients and mild improvement in 2 patients.

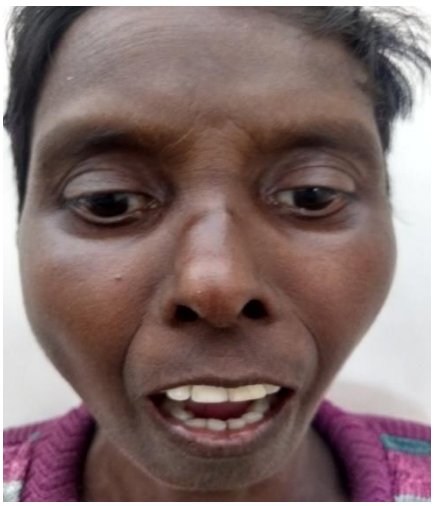
4)**Extent and severity of skin sclerosis:**4 patients showed marked improvement in skin sclerosis, 10 patients showed moderatew improvement and 6 showed mild improvement.

5)**Dysphagia:** 2 patients showed marked improvement , 5 showed moderate improvement and 1 showed mild improvement.

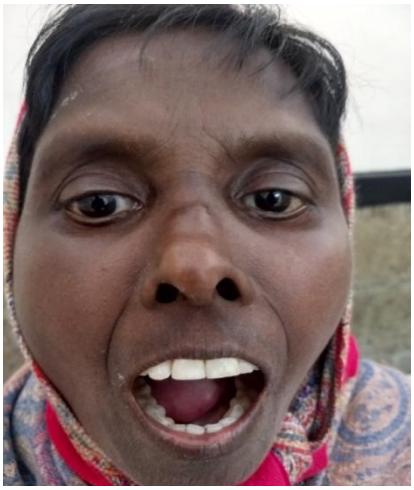
6)**Mouth opening:** 13 patients showed marked improvement in mouth opening, 5 showed moderate improvement and 2 showed mild improvement.

All patients improved with the therapy and improvement was seen in all clinical features. All laboratory investigations were repeated and all parameters showed favourable response without any derangements after pulse therapy.

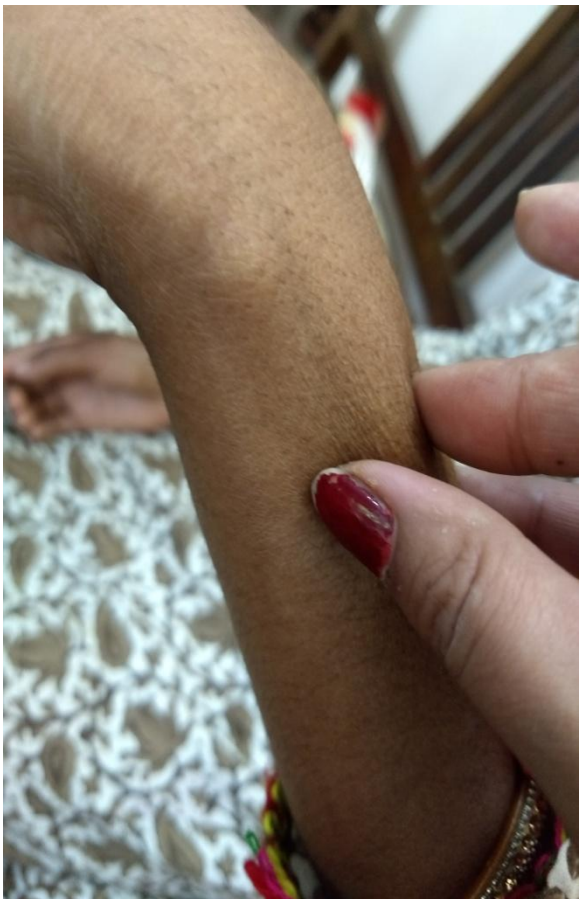
Adverse effects were pain at the site of injection, chills, diarrhoea and pain abdomen.



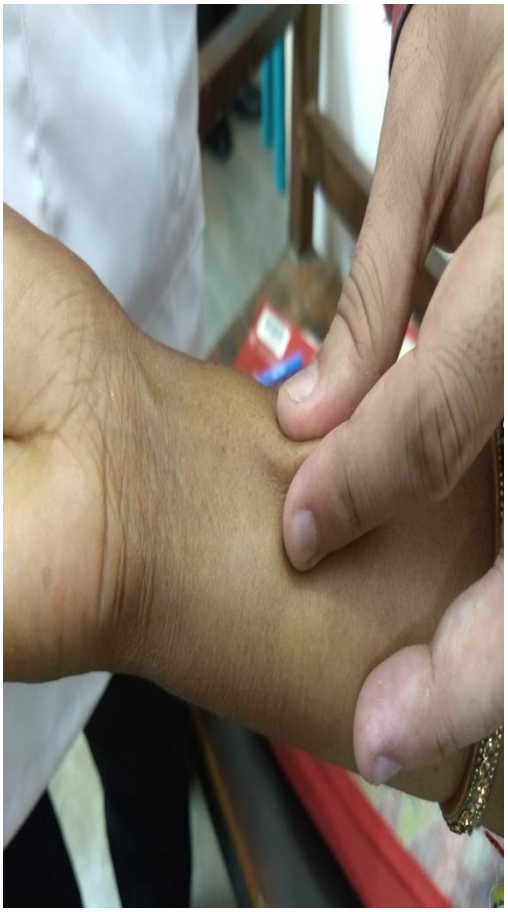
BEFORE PULSE THERAPY



AFTER 12 CYCLES OF PULSE THERAPY



BEFORE PULSE THERAPY



AFTER 12 CYCLES OF PULSE THERAPY

## VI. Discussion

The ideal therapy of systemic sclerosis is still debatable and there is no universal agreement over the choice of therapy.[7,8]There have been preliminary reports of beneficial effects of steroid pulse therapy in systemic sclerosis but in very few patients.[9]Steroid pulse therapy has been used in many immune mediated disorders like pemphigus,bullous pemphigoid, systemic lupus erythematosus, pyoderma gangrenosum etc.[10,11]Many patients with systemic sclerosis are being treated in our cantre with the dexamethasone pulse therapy. The overall satisfaction is good in patients. There has been a positive response in a majority of the patients. Most of the patients started showing improvement within first 3-6 months after the start of therapy. Patients in whom treatment was started at early stage of disease showed more improvement as compared to patients who has advanvced disease at the beginning of therapy.

## VII. Conclusion

On the basis of our evaluation dexamethasone cyclophosphamide pulse is an effective and safe modality of treatment in patients of systemic sclerosis.

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