

Pulse dexamethasone therapy versus pulse methylprednisolone therapy for treatment of Graves's ophthalmopathy

Rajeev Philip, Sanjay Saran, Manish Gutch, Pushpaltha Agroyia¹, Rajiv Tyagi, Keshavkumar Gupta

Department of Endocrinology, LLRM Medical College, ¹Department of Ophthalmology, Subharthi Medical College, Meerut, Uttar Pradesh, India

ABSTRACT

Pulse methylprednisolone therapy is the recommended therapy for moderate to severe and active ophthalmopathy, but high dose pulse methylprednisolone therapy is marred by the chances of fulminant hepatic failure and the high cost of therapy. Dexamethasone pulse therapy can be considered as an alternative to pulse methylprednisolone therapy. A prospective randomized control trial was carried out in 21 patients comparing pulse dexamethasone therapy versus pulse methylprednisolone therapy in Graves's ophthalmopathy. This study proved that pulse dexamethasone therapy is a cheaper and equally effective therapy for Graves's ophthalmopathy and the cost of therapy is reduced to at least 1/8th s. Furthermore, dexamethasone had a better effect on reduction of exophthalmos. The dreaded complication of fulminant hepatic failure, associated with high dose of methylprednisolone, is not seen with dexamethasone therapy.

Key words: Graves' ophthalmopathy, pulse dexamethasone therapy, pulse methylprednisolone therapy

INTRODUCTION

Graves' ophthalmopathy is a potentially sight threatening ocular disease, which is seen in patients with autoimmune thyroid disease.^[1] Pulse methylprednisolone therapy is the recommended therapy for moderate to severe and active ophthalmopathy.^[2,3] High dose pulse methylprednisolone therapy is marred by the chances of fulminant hepatic failure and the high cost of therapy.^[4] Dexamethasone pulse therapy can prove as a safe and cheaper alternative for pulse methylprednisolone therapy in the treatment of Graves ophthalmopathy.

Objectives

1. To study the efficacy of pulse dexamethasone therapy in Graves ophthalmopathy

2. To compare the efficacy and side-effect profile of pulse dexamethasone therapy as compared with pulse methylprednisolone therapy in Graves ophthalmopathy.

MATERIALS AND METHODS

A prospective randomized control trial was performed comparing pulse dexamethasone therapy versus pulse methylprednisolone therapy in Graves's ophthalmopathy. A total of 21 patients, all of whom were having active moderate to severe Graves's ophthalmopathy were recruited for the study. Seventeen patients were biochemically hyperthyroid at the start of the study and four patients were euthyroid (with or without treatment). After getting informed consent, patients were divided into two comparable groups with regard to age, smoking status, activity and severity of Graves's ophthalmopathy and thyroid status [Table 1]. Out of the 21 patients, 10 patients received pulse methylprednisolone therapy, (500 mg intravenous [i.v.] weekly for 6 weeks and 250 mg i.v. weekly for next 6 weeks) and 11 received pulse dexamethasone therapy 100 mg i.v. for 6 weeks followed by 50 mg i.v. for 6 weeks. All patients received pantoprazole injection before the pulse steroid therapy. Patients were followed-up

Access this article online

Quick Response Code:



Website:
www.ijem.in

DOI:
10.4103/2230-8210.119556

Corresponding Author: Dr. Rajeev Philip, G 10, PG Hostel, LLRM Medical College, Meerut - 250 004, Uttar Pradesh, India.
E-mail: endollrm@yahoo.com

for 12 weeks and the following parameters – clinical activity score, measures of severity - diplopia, lid retraction and exophthalmos and other parameters such as weight, blood pressure, blood glucose, aspartate amino transferase and alanine amino transferase (ALT) were assessed at baseline and 3 months after therapy. A Student *t*-test and Chi-square test were used to analyze the results using the Statistical Package for the Social Sciences statistical software version 13 (IBM USA).

RESULTS

After 3 months of therapy with pulse dexamethasone, there was a statistically significant change in clinical activity score (CAS), with mean CAS falling from 4.8 to 1.0 ($P < 0.05$). The severity parameters assessed, lid aperture and exophthalmos, also showed a statistically significant difference, with $P < 0.05$. However, there was no significant improvement in diplopia [Table 2].

Treatment with methylprednisolone also showed a similar trend, with statistically significant change in CAS, with mean CAS improving from 4.9 to 1.1 ($P < 0.05$). Lid aperture and exophthalmos, also showed a statistically significant difference, with P values < 0.05 but, diplopia had no significant improvement with P value of 0.641 [Table 3].

When the efficacy of treatment between groups was compared, there was no significant difference between dexamethasone and methylprednisolone groups with regard to improvement in CAS, change in lid aperture or change in diplopia. But the improvement in exophthalmos was better in the dexamethasone group, with a P value of 0.03 [Table 4].

As far as the side-effect profile was concerned, dexamethasone group had more of weight gain and one patient developed diabetes. But, there were two cases of elevation of ALT in the methylprednisolone group while the dexamethasone group had none [Table 5].

DISCUSSION AND CONCLUSIONS

Pulse methylprednisolone therapy is an effective therapy for Graves ophthalmopathy, but has the limiting factors of fulminant hepatic failure and high cost of therapy.^[5] Our study proves that pulse dexamethasone therapy is a cheaper and equally effective therapy for Graves ophthalmopathy and the cost of therapy is reduced to at least 1/8th s. Also, dexamethasone has a better effect on reduction of exophthalmos. The dreaded complication of fulminant hepatic failure, associated with high dose of methylprednisolone, is not seen with dexamethasone therapy. Regular monitoring of liver function tests is not required with dexamethasone therapy,

reducing the cost of therapy. There is a slightly increased incidence of diabetes and weight gain with dexamethasone therapy, but patient who developed diabetes, reverted to normal blood glucose after 3 months.

Pulse dexamethasone therapy can be considered as a cheaper and safer alternative of pulse methylprednisolone therapy in the treatment of Graves's ophthalmopathy.

Table 1: Baseline characteristics

	Dexamethasone group	Methylprednisolone group
No. of patients	11	10
Mean (age)	36.1 years	39.5 years
Sex (Female:Male)	8:3	8:2
Mean T4 (µg/dL)	19.4	18.2
Mean CAS	4.8	4.9
Mean eye lid aperture (mm)	3.1	3.0
Mean exophthalmos (mm)	22.2	21.8
Diplopia present (%)	45	50

CAS: Clinical activity score

Table 2: Change in parameters-dexamethasone group

Parameter	Pre-treatment	After 3 months	P value
Mean CAS	4.8	1.0	<0.05
Mean eye lid aperture (mm)	3.1	1.91	<0.05
Mean exophthalmos (mm)	22.2	21	<0.05
Diplopia present (%)	45	27	0.6594

CAS: Clinical activity score

Table 3: Change in parameters-Methylprednisolone group

Parameter	Pre-treatment	After 3 months	P value
Mean CAS	4.9	1.1	<0.05
Mean eye lid aperture (mm)	3.0	1.99	<0.05
Mean exophthalmos (mm)	21.8	21.2	<0.05
Diplopia present (%)	50	30%	0.641

CAS: Clinical activity score

Table 4: Change in parameters comparison between groups

Parameter	Dexamethasone	Methylprednisolone	P value
Mean CAS	1.0	1.1	0.35
Mean eye lid aperture (mm)	1.91	1.99	0.45
Mean exophthalmos (mm)	21	21.2	0.03
Diplopia present (%)	27	30	0.754

CAS: Clinical activity score

Table 5: Side-effects

	Dexamethasone group	Methylprednisolone group
Weight gain (more than 3 kg) (%)	7/11 (63)	5/10 (50)
New onset diabetes	1/11	0/10
New onset hypertension	0/11	0/10
Elevation of ALT (>11/2 from baseline)	0/11	2/10

ALT: Alanine amino transferase

REFERENCES

1. Bartley GB. The epidemiologic characteristics and clinical course of ophthalmopathy associated with autoimmune thyroid disease in Olmsted County, Minnesota. *Trans Am Ophthalmol Soc* 1994;92:477-588.
2. Kahaly GJ, Pitz S, Hommel G, Dittmar M. Randomized, single blind trial of intravenous versus oral steroid monotherapy in Graves' orbitopathy. *J Clin Endocrinol Metab* 2005;90:5234-40.
3. van Geest RJ, Sasim IV, Koppeschaar HP, Kalmann R, Stravers SN, Bijlsma WR, *et al.* Methylprednisolone pulse therapy for patients with moderately severe Graves' orbitopathy: A prospective, randomized, placebo-controlled study. *Eur J Endocrinol* 2008;158:229-37.
4. Weissel M, Hauff W. Fatal liver failure after high-dose glucocorticoid pulse therapy in a patient with severe thyroid eye disease. *Thyroid* 2000;10:521.
5. Marinó M, Morabito E, Brunetto MR, Bartalena L, Pinchera A, Marocci C. Acute and severe liver damage associated with intravenous glucocorticoid pulse therapy in patients with Graves' ophthalmopathy. *Thyroid* 2004;14:403-6.

Cite this article as: Philip R, Saran S, Gutch M, Agroyia P, Tyagi R, Gupta K. Pulse dexamethasone therapy versus pulse methylprednisolone therapy for treatment of Graves's ophthalmopathy. *Indian J Endocr Metab* 2013;17:S157-9.

Source of Support: Nil, **Conflict of Interest:** None declared.