FREQUENCY OF SERUM CORTISOL SUPPRESSION IN PATIENTS USING 0.05% CLOBETASOL PROPIONATE AS TOPICAL STEROID FOR MORE THAN 3 WEEKS

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ABSTRACT

Objective: To determine the frequency of serum cortisol suppression in patients using 0.05% clobetasol propionate as topical steroid for more than 3 weeks.

Study Design: Cross sectional Study.

Place and Duration of Study: Both outdoor and indoor patients of Dermatology Department, Military Hospital (MH) Rawalpindi for duration of 6 months i.e. from 18th April 2012 to 17th October 2012 were selected.

Patients and Methods: A total of 189 patients were included in the study. Non-probability purposive sampling technique was used. Early morning (0800 hrs) serum for cortisol levels was taken before starting the treatment and same was repeated after 3 weeks at AFIP. Effect modifiers like age and gender were controlled through stratification. The data was analyzed using SPSS version 10. The quantitative variables like age, duration of illness were calculated by taking standard deviation and mean whereas the qualitative variables like gender, suppression of serum cortisol levels were calculated by taking percentages and frequency. Frequency of serum cortisol suppression was presented according to gender and age groups.

Results: Majority of the patients selected were between 31-40 years i.e. 44.98% (n=85). Gender distribution was 61.90% (n=117) males and 38.10% (n=72) females. Frequency of serum cortisol suppression in patients using 0.05% Clobetasol propionate as topical steroid for more than 3 weeks was seen in 33.33% (n=63).

Conclusion: The frequency of serum cortisol suppression was significantly higher amongst patients using clobetasol propionate 0.05%. Therefore patients prescribed clobetasol propionate 0.05% topically should be checked for serum cortisol suppression regularly if the application is intended to be used for more than 3 weeks.

Keywords: Clobetasol propionate, Serum cortisol suppression, Topical steroids.

INTRODUCTION

The development of topical corticosteroids has allowed many skin diseases to be more effectively treated. Certain age groups like children and body sites such as the flexures and face, areas of desquamation and inflammation and areas with a thin epidermis are significantly more permeable to topical steroids.

Normally serum cortisol concentrations are highest in the morning (about 8 AM), between 5 to 25 µg/dl (135 to 675 nmol/L) and lowest, less than 5 µg/dl (135 nmol/L), one hour after the normal sleeping time. Glucocorticoids exert negative feedback control on the hypothalamic-pituitary-adrenal axis by suppressing corticotrophin-releasing hormone (CRH) production and corticotrophin (ACTH) secretion[2,3,4] leading to both adrenal atrophy and loss of cortisol secretion. Levels of serum cortisol less than 3µg/dl (87nmol/l) makes adrenal insufficiency a very likely outcome[5]. Patients with primary or secondary adrenal insufficiency were found to have low early morning serum cortisol concentrations.

Clobetasol propionate is amongst one of the potent topical steroids. Ointments generally have better absorption. So clobetasol propionate ointment when topically applied can cause significant hypothalamic pituitary axis (HPA) suppression[6] to the extent that as little as 2 g/day of clobetasol propionate, 0.05% ointment,

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can cause adrenocortical insufficiency after only a few days of usage[7,8].

By studying the frequency of serum cortisol suppression in patients using 0.05% clobetasol propionate we will be able to see the magnitude of problem which will be further helpful for treatment and management protocol.

MATERIAL AND METHODS

Patients of both gender between 18-50 years were selected with duration of illness (eczema and psoriasis) less than one month. Patients with known hypersensitivity to clobetasol or any component of the formulation and on oral steroids were excluded. Non-probability purposive sampling was done.

Since the prevalence of suppression was about 40%[1], assuming p=0.40 (40%) and absolute precision of 7% the estimated sample size on 5% chance of error via WHO calculator was 189. Patients from outpatient department (OPD) of Dermatology and skin ward at Military Hospital (MH) Rawalpindi, fulfilling the criteria were selected after written informed consent and permission from Hospital Ethical Review Committee. They were diagnosed by registrar and consultant dermatologist. Early morning (0800 hrs) serum for cortisol level was sampled before starting the treatment and repeated after 3 weeks. Tests were done at AFIP. Effect modifiers like age and gender were controlled through stratification. Topical clobetasol propionate ointment 0.05% (10g) was applied in smallest amount that covered the affected area except face and intertriginous areas so as total dose should not exceed 50 g/wk for 3 weeks. Fingertip unit was used i.e. single application of ointment on fingertip of index finger will apply 1 gm of ointment. Adrenal suppression levels of serum cortisol; taken at 0800 hrs following 3 weeks of treatment, less than 3 µg/dl (83nmol/l) was taken as cases of adrenal suppression. Normal serum cortisol levels are 5-25 µg/dl (135-675 nmol/l). The data was analyzed using SPSS version 10. The quantitative variables like age, duration of illness were calculated by taking standard deviation and mean whereas the qualitative variables like gender, suppression of serum cortisol levels were calculated by taking percentages and frequency. Frequency of serum cortisol suppression was presented according to gender and age groups.

Table-1: Frequency of serum cortisol suppression in patients using 0.05% clobetasol propionate as topical steroid for more than 3 weeks (n=189).

Serum Cortisol Suppression	No. of patients	Percentage
Yes	63	33.33
No	126	66.67
Total	189	100

Table-2: Stratification of serum cortisol suppression according to age of the patients (n=189)

Age(in years)	No. of patients	Serum Cortisol Suppression (n=63)	
		No. of patients	Percentage
18-30	41	12	19.05
31-40	85	32	50.79
41-50	63	19	30.16
Total	189	63	100

Table-3: Stratification of serum crtisol suppression according to gender of the patients (n=189).

Gender	No. of patients	Serum Cortisol Suppression (n=63)	
		No. of patients	Percentage
Male	41	21	33.33
Female	85	42	66.67
Total	189	63	100

RESULTS

A total of 189 cases fulfilling the inclusion/exclusion criteria were included in the study. Majority of the patients were between 31-40 years i.e. 44.98% (n=85), 21.69% (n=41) were between 18-30 years and 33.33%

(n=63) were between 41-50 years of age, while mean and SD was calculated as 34.29 ± 4.43 years. Gender distribution of the patients shows 61.90% (n=117) were male and 38.10% (n=72) females.

Time duration of illness cure in case of eczema, if it was limited to one region was between 2-4 weeks with an average of 3 weeks n in case of extended eczema was 4-8 weeks with an average of 6 weeks. In case of psoriasis if body surface area involved is less than 5%, average time of healing was 10-16 weeks with an average of 13 weeks and if more than 5% was 20-26 weeks with an average of 24 weeks. Frequency of serum cortisol suppression in patients is 33.33% as depicted in table no-1. Stratification of serum cortisol suppression according to age of the patients was max i.e. 50.79% (n=32) between 31-40 years as reviewed in table no-2. Stratification of serum cortisol suppression according to gender show females revealed the suppression more than males i.e. 66.67% (n=42) and is shown in table-3.

DISCUSSION

Corticosteroids have been in use for half a decade. Over the time, they have become the corner stone in controlling a variety of diseases. Topical steroids have both immediate effects like membrane stabilization and delayed effects secondary to alteration of DNA transcription. Clinical usage of glucocorticoids is due to its four basic properties like vasoconstrictive, antiproliferative, immunosuppressive and anti-inflammatory effects[9]. Clobetasol propionate is a synthetic corticosteroid often used topically. Clobetasol is an analog of prednisolone and is known to have high glucocorticoid but low mineralocorticoid activity. One gram of 0.05% cream contains 0.5 mg clobetasol propionate in a cream base of propylene glycol, cetostearyl alcohol, glycerylmonostearate, glyceryl stearate, chlorocresol, sodium citrate anhydrous, citric acid anhydrous, white wax, and purified water. As minimum as 2 g/day of clobetasol propionate, 0.05% cream, can cause a decreased morning cortisol level only in few days[6,7].

In a report ''Evaluation of the pituitary adrenal axis function in patients on topical steroid therapy'' in JAAD, Dr Kerner and her colleagues reviewed the cortisol responses to ACTH after at least 2 weeks' of administration of topical glucocorticoids and about 40%of patients had abnormal responses[1]. Allenby et al stated adrenal suppression in about 64%of adults applying 50 g or more of a potent topical steroid for at least 2 weeks. Abnormal early morning i.e. 8 a.m. serum cortisol levels have been reported in 29% of individuals in a retrospective study of children with vitiligo using moderate to potent topical steroid for a mean of 2 weeks[9].

Kerner and workers found the frequency of cortisol suppression was 40 % in patients using 0.05% clobetasol propionate as topical steroid for more than 3 weeks[1]. While Mader found cortisol suppression in 38% of patients[10].

Andres and workers[7] found clobetasol propionate to be a very effective treatment for psoriasis but its use has been limited by hypothalamic-pituitary-adrenal (HPA) axis suppression and adrenal atrophy. It was also demonstrated that clobetasol propionate shampoo did not lead to skin atrophy or HPA axis suppression but the gel formulation did. Despite the short contact application time, the clobetasol propionate shampoo provides similar efficacy results to the gel.

The results of the study reveals that majority of the patients recorded in between 31-40 years i.e. 44.98% (n=85) 61.90% (n=117) were males and 38.10% (n=72) females, while frequency of serum cortisol suppression in patients using 0.05% clobetasol propionate as topical steroid for more than 3 weeks revealed 33.33% (n=63).

In view of the above findings we determined that the frequency of serum cortisol suppression in patients using 0.05% clobetasol propionate is considerable higher while prescribing the topical agent (0.05% clobetasol propionate), the side effect i.e serum cortisol suppression may be kept in mind.

CONCLUSION

The frequency of serum cortisol suppression was signifanctly higher amongst patients using the clobetasol propionate 0.05%. Therefore patients prescribed clobetasol

propionate 0.05% topically should be checked for serum cortisol suppression at regular intervals if the application is intended to be used for more than 3 weeks.

CONFLICT OF INTEREST

This study has no conflict of interst to declare.

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