

## Original Article

**Cutaneous side effects of oral corticosteroid therapy**

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**Abstract** *Background* Corticosteroids revolutionized the treatment of many skin disorders during 5<sup>th</sup> and 6<sup>th</sup> decades of last century. They have anti inflammatory, vasoconstrictor, antiproliferative and immunosuppressive effects.

*Objective* The study was aimed to determine the frequency of cutaneous changes in patients on oral steroids and to see the pattern of these changes in our population.

*Material and methods* The study was carried out in the department of dermatology, Civil Hospital, Karachi. 204 patients fulfilling the inclusion criteria completed in the study. All the patients were taking 60-80mg of oral steroids for a minimum of 2 weeks. Findings were recorded on a preformed pro forma. Any relevant investigations were also carried out. Results were then compiled and tabulated.

*Results* Multiple cutaneous infections was the most common side effect seen in 45 patients (22%,  $p>0.10$ ). Moon face was seen in 39 patients (19%,  $p<0.001$ ) and buffalo hump in 17 patients (8.3%,  $p>0.08$ ). Atrophic changes were a feature in 45 patients (22.5%,  $p>0.47$ ). Other findings seen in our patients were acneiform eruptions in 18 patients (8.7%,  $p<0.001$ ) and hypertrichosis in 8 patients (4%,  $p>0.013$ ).

*Conclusion* Oral steroid therapy is associated with significant cutaneous side effects which depend on the dose and duration of therapy. Bacterial infections remain the most common side effect.

**Key words**

Oral steroids, infections, atrophy, moon face, buffalo hump.

**Introduction**

Corticosteroids revolutionized the treatment of many skin disorders during 5<sup>th</sup> and 6<sup>th</sup> decades of the last century. The basic structure of steroid molecule is perhydrocyclopentanophenanthrene ring. Modifications in the primary structure of

this ring gives rise to steroids of different potencies and properties. Steroids have anti-inflammatory, vasoconstrictor, antiproliferative and immunosuppressive actions.<sup>1</sup>

Steroids may be administered orally, topically, parenterally or intralesionally. They affect many systems of the human body. Common cutaneous side effects are striae, purpura, telangiectases, hypertrichosis, pigmentary disturbances and acneiform eruptions. Increased frequency

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and worsening of cutaneous infections like tinea, impetigo or scabies may occur. Dermatoses like acne, rosacea and psoriasis may be worsened by the injudicious use of steroids. Long term use of steroids causes redistribution of body fat. This may lead to moon face and buffalo hump with slender extremities. Most of these side effects of steroids are related to the dose and duration of steroid therapy.<sup>2</sup>

The study was aimed to determine the frequency of cutaneous changes in patients on oral steroids and to see the pattern of these changes in our population.

### **Material and methods**

The study was carried out at the department of dermatology, Civil Hospital, Karachi. Patients fulfilling the inclusion criteria were enrolled in the study from 1<sup>st</sup> June, 1999 to 31<sup>st</sup> May, 2000. Patients belonging to both sexes aged 15 to 60 years were included in the study. Only those patients who had been taking 60-80mg of steroids for a minimum duration of 2 weeks were studied. Patients on oral prednisolone for the treatment of various underlying conditions like pemphigus, pemphigoid, systemic lupus erythematosus, rheumatoid arthritis, scleroderma and vasculitis were enrolled. They were on no other medication.

After a detailed history, general, systemic and cutaneous examination, findings were recorded on a preformed pro forma. Results were then compiled and tabulated. In addition to routine investigations, any relevant investigations were also carried out where required. These included scrapings for fungus, swabs for culture and sensitivity,

Tzanck smear and skin biopsy for histopathology.

### **Results**

A total of 205 patients completed the study, there were 80 males (39%) and 125 females (61%), male to female ratio being 0.6:1. The minimum age of presentation was 15 years and maximum 60 years, while the mean age was 42.3 years. **Table 1** reveals the frequency of different cutaneous side effects of oral steroid therapy seen in our patients.

Amongst infections, bacterial infections were the most commonly seen in 16 patients (8%,  $p < 0.47$ ) followed by dermatophytic, candidal and viral infections. Bacterial infections accounted for folliculitis, furuncles and carbuncles. Dermatophytoses were observed in 11 patients (5.3%,  $p > 0.20$ ) and these included tinea corporis and tinea cruris. Candidiasis was a feature in 13 patients (6.3%,  $p > 0.05$ ). Among viral infections seen in 5 patients (2.4%,  $p > 1.00$ ), herpes simplex and herpes zoster were the most prominent.

Redistribution of body fat accounted for 27.3%. The findings were moon face in 39 patients (19%,  $p < 0.001$ ) and buffalo hump in 17 patients (8.3%,  $p > 0.08$ ).

Atrophic changes in the skin occurred in 45 patients (22.4%,  $p > 0.47$ ). The skin exhibited easy bruising in 14 patients (7%,  $p > 0.45$ ), atrophy in 12 patients (6%,  $p > 0.41$ ), purpura in 12 patients (6%,  $p > 1.00$ ) and striae in 7 patients (3.4%,  $p > 0.28$ ). Among the miscellaneous side effects, acneiform eruptions accounted for 18 patients (8.7%,  $p > 0.18$ ) and hypertrichosis was a feature in

**Table 1** Cutaneous side effects of oral steroid therapy (n=205)

Side effect	n (%)
Moon face and buffalo hump	56 (27.3)
Infections	45 (22.4)
Atrophic changes	45 (22.4)
Acneiform eruptions	18 (8.7)
Hypertrichosis	8 (4)
Maculopapular eruptions	2 (1)

8 patients (4%,  $p>0.013$ ).

## Discussion

The basic structure of steroid molecule is perhydrocyclopentanophenanthrene ring. They have anti-inflammatory, immunosuppressive and antiproliferative actions. They have many cutaneous side effects most of which are related to the dose and duration of therapy.<sup>2</sup> Most of the enrolled patients developed side effects at the dose of 60mg-80mg after a minimum period of 2 weeks.

Cutaneous infection was the most common finding in our study, seen in 45 patients (22%,  $p>0.10$ ) taking oral steroids for a period of 3 weeks at a dose of 60mg daily. Stuck *et al.*<sup>3</sup> reported a frequency of 12.7% for the infections in their patients on oral steroids. The figures in our study are thus higher as compared to those reported previously. Poor hygiene, malnourishment and a relatively elder age may account for the difference. Akhter *et al.*<sup>4</sup> in another study from Punjab, claimed a high frequency of infections in patients with pemphigus vulgaris using high doses of steroids.

Moon face was seen in 39 patients (19%,  $p<0.001$ ) and buffalo hump accounted for 17

patients (8.3%,  $p>0.08$ ) on oral steroid therapy due to underlying redistribution of body fat. The difference in relative sensitivities to insulin in peripheral and terminal adipocytes results in these changes. Moreover, their receptors also respond differently to glucocorticoid facilitated lipolytic effects.<sup>5,6</sup> The particular change was observed earlier in our patients i.e. after 3 weeks of steroid therapy.

Atrophic changes in the skin were commonly observed in our patients. Worldwide studies<sup>7-11</sup> have shown steroids to cause atrophic changes in skin. Striae distensae observed in (3.4%) of our patients were large and widely distributed on abdomen and thighs. Evans,<sup>12</sup> in his study reported the change in 100 patients on oral steroids. Easy bruising (7%) and purpura (6%) were also observed in our patients. Atrophic changes were a feature in the patients taking oral steroids for a minimum of 8 weeks. The figures we have reported are in accordance with the previously reported studies.

Acne was observed in 8 patients (8.7%,  $p<0.001$ ) in our study. They were taking oral steroids for a period of at least 3 weeks. All the patients had papulopustular lesions and comedones were not seen. The underlying pathogenesis of these acneiform eruption remains unclear, however steroids have no effect on the number of surface bacteria but induce ductal hypercornification. Precious *et al.*<sup>13</sup> and Samma *et al.*<sup>14</sup> in their studies, have revealed similar figures for acne. Thus the finding in our study is consistent with the literature.

Hypertrichosis seen in 8 patients (4%,  $p > 0.013$ ) was predominantly seen on cheeks and temples in our patients.

### Conclusion

Oral steroid therapy has a significant frequency of cutaneous side effects which depend upon the dose and duration of therapy. Cushingoid features and infections remain the most common findings.

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