Corticosteroids in Dentistry

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ABSTRACT
Glucocorticosteroids are used extensively in dentistry for their anti-inflammatory and immunosuppressive effects. Most of the diseases for which steroids are used are characterized by inflammation, which appears secondary to a hypersensitivity reaction against auto components. Glucocorticoids do not interfere with the primary disease mechanisms but they are used because of their anti-inflammatory and immunosuppressive effects. It seems reasonable to profit from steroids as palliatives in acute phases of the disease and/or as long-term suppressors of the general host defense. The article deals with the use of corticosteroids in the treatment of the various conditions and diseases affecting oral cavity.

Keywords: Corticosteroids, Anti-inflammatory, Immunosuppressive, Oral lesions.

INTRODUCTION
Corticosteroid drugs have been used therapeutically for a growing number of disorders over the last half-century. The number of synthetic corticosteroids available to the clinician has also increased, with drugs of varying potency and duration of action to suit the intended purpose. Corticosteroids have revolutionized the management of several disabling conditions and saved many lives. However, they have adverse drug reactions and are suboptimally prescribed. In UK, it is estimated that more than 250,000 people are taking continuous oral corticosteroids, and more than half of all children being treated for asthma in primary care are exposed to chronic high doses of corticosteroids via combination of inhaler and intranasal devices.

Physiology of the Corticosteroids
There are three groups of steroid hormones produced in the adrenal cortex: The androgens, the mineralocorticoids and the glucocorticoids. Adrenal cortex secretes glucocorticoid and steroid have widespread effect on the metabolism of carbohydrate and protein.

The zona fasciculata secretes glucocorticoids, cortisol and corticosterone as well as small amount of adrenal androgen and estrogens. The secretion of these cells is controlled by hypothalamic pituitary axis (HPA) via adrenocorticotrophic hormone (ACTH).3

Uses of Corticosteroids in Dentistry
Steroids are commonly used to limit postoperative inflammation. Two recent applications have been the combination of hydrocortisone with oxytetracycline to prevent alveolar osteitis7 and the prevention of postoperative lingual and inferior alveolar nerve hypersensitivity following third molar extractions by using dexamethasone in conjunction with the analgesic agent dipyrone.8

Corticosteroid is used in following conditions:

Prophylactic Drugs
In oral surgery, various major surgical procedures, like sagittal split osteotomy, vestibuloplasty procedure, preprosthetic surgery, third molar surgery, an excoriation and ulceration of lips due to retraction of lips, corticosteroids have been given prophylactically to limit postoperative edema, usually high dose; short-term steroids are used because it has no effect on wound healing and absence of withdrawal symptoms. In major surgical procedures, the main function of steroids is, it decreases edema, trismus, pain and hospitalization time.

Recurrent Aphthous Ulceration (RAU)
It is one of the most common oral mucosal pathosis. Systemic prednisone therapy should be started at 1.0 mg/kg once a day in patients with severe RAU and should be tapered after 1 to 2 weeks. The aim of treatment is to intercept the development of the ulcerative phase of the lesion by exploiting the immunosuppressive activity of glucocorticoids.10, 23

Desquamative Gingivitis
Corticosteroid is used extensively in various conditions causing desquamative gingivitis.26

Lichen planus: The erosive, bullous or ulcerative lesion of lichen planus are treated with high potency topical steroids, such as 0.05% fluocinonide ointment (Lidex, three times a day).
Lidex can also be mixed 1:1 with carboxy methyl cellulose paste or other adhesive ointment. A gingival tray can also be used to deliver 0.05% clobetasol propionate with 1,00,000 IU/ml of Nystatin in orabase. Around 3 to 5 minutes application of this mixture daily appear to be effective in controlling erosive lichen planus. In case of oral lichen planus (LP), anti-inflammatory agents, such as the glucocorticosteroids (GC), e.g. hydrocortisone plays a front-line role in the management of such conditions. Intralestional injection of triamcinolone acetonide (10-20 mg) or short-term regimens of 40 mg of prednisone daily for 5 days, followed by 10 to 20 mg daily for an additional 2 weeks, have also been used in most severe cases.

**Bullous pemphigoid:** The primary treatment of bullous pemphigoid is moderate dose of systemic prednisone. Steroids sparing strategies (prednisone + other immunomodulator drugs) are used when high doses of steroids are needed or the steroid alone fails to control the disease. Clobetasol propionate 20 mg to 40 mg/day is more effective for the treatment of bullous pemphigoid.

**Mucous membrane pemphigoid:** Topical steroids are used in the treatment of mucous membrane pemphigoid, particularly when localized lesions are present. Fluocinonide (0.05%) and clobetasol propionate (0.05%) in an adhesive vehicle can be used three times a day for up to 6 months. When the oral lesions of mucous membrane pemphigoid are confined to the gingival tissues, topical corticosteroids are affectively delivered with vacuum formed custom trays or veneers.

Systemic therapy of mucous membrane pemphigoid prednisone is usually given at a dose of 1 to 1.5 mg/kg/day, with appropriate monitoring for side effects. Therapy with prednisone lasts several months. Accordingly, calcium and vitamin D supplementation, along with bisphosphonate therapy and baseline dual energy X-ray absorptiometry (DEXA) scanning, should be considered. Generally, the adjuvant immunosuppressive drug is continued for approximately 2 years.

**Pemphigus vulgaris:** The main therapy for pemphigus vulgaris is systemic corticosteroids with or without the addition of other immunosuppressive agent. Topical corticosteroid (0.1% triamcinolone acetonide) provides benefit in pemphigus vulgaris. In patient not responsive to corticosteroids or who gradually adapt to them, “steroids sparing” therapies are used. Pulse therapy of pemphigus vulgaris, the big short refers to the discontinuous intravenous infusion of very high doses of corticosteroids over a short time. Doses of each pulse are not standardized but are usually 500 to 1000 mg methylprednisolone or 100 to 200 mg dexamethasone. The aim of pulse therapy is to achieve a faster response and stronger efficacy and to decrease the need for long-term use of systemic corticosteroids.

**Erythema Multiforme**

In the treatment of erythema multiforme (EM)—oral prednisone, 60 mg/day slowly tapered by 10 mg/day over 6 weeks. In the treatment of erythema multiforme (EM)—oral prednisone, 60 mg/day slowly tapered by 10 mg/day over 6 weeks.21

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**In Emergency Drug Kit**

Corticosteroids are used to manage acute allergic reaction, after use of epinephrine and histamine blocker in prevention of recurrent anaphylactic shock. Corticosteroids are used as second line of drug because of their slow onset of action (after IV takes 60 minutes to act). Because dexamethasone and methyl prednisolone are contraindicated in acute adrenal insufficiency, therefore, hydrocortisone sodium succinate is the drug of choice.

**Infectious Mononucleosis**

Corticosteroids have shown to shorten the febrile course and alleviate malaise and lassitude. Prednisone in doses of 60 to 80 mg/day should be used initially with rapid reduction, as clinical improvement occurs.

**Central Giant Cell Granuloma**

Intralesional steroids are used in the treatment of central giant cell granuloma. In one of the study, equal parts of triamcinolone acetonide (10 mg) and lidocaine (0.5%) were mixed. Approximately, 3 ml of solution was injected into the lesion by multiple penetrations with a needle of 0.5 mm in diameter. The injections were done weekly. In 6th week, if penetration of the cortex overlying the osteolytic zone was no longer visible; this determined the end of the treatment. Three weeks after termination of the intralesional injection bony regeneration could be observed radiologically.

**Bells Palsy**

Most common form of facial paralysis is Bells palsy, pathogenesis is unknown. Treatment: Prednisone 60 to 80 mg daily during first 5 days and then taper over the next 5 days.

**Melkerson Rosenthal Syndrome**

Systemic corticosteroids are effective in reducing swelling and preventing persistent tissue edema. Occasional short courses of systemic corticosteroids, such as prednisone in dose of 1 to 1.5 mg/kg/day, tapering over 3 to 6 weeks depending on the severity of the episode may be effective.

**Mucocele**

Intralesional injections of corticosteroids have been used successfully to treat cases of mucoceles.

**Oral Submucous Fibrosis**

Submucosal injections of a combination of dexamethasone (4 mg/ml) and two parts of hyaluronidase (200 usp unit/ml) diluted in 1 ml of 2% xylocaine by means of a 27 gauge dental needle, not more than 0.2 ml solution/site for a period of 20 weeks. Similarly submucosal injection of triamcinolone 10 mg/ml diluted in 1 ml of lidocaine 2% to avoid immediate tissue irritation and to facilitate proper distribution of drug at the sites, biweekly recommended.
TMJ Disorders
Intra-articular corticosteroids have been proved useful in alleviating pain, swelling and dysfunction in inflammatory diseases of TMJ disorders. Glucocorticosteroids (betamethasone—3 mg/ml) are often injected together with a local anesthetic agent to counteract some of local adverse effects.\(^5\)

Use of Steroid in Endodontia
Corticosteroids are used as an endodontic anodyne.\(^2\) Steroids along with the broad spectrum antibiotics are used as a pulp capping agent due to its anti-inflammatory and anti-allergic property.
For example,
• Pulpovital = prednisolone + chloramphenicol + neomycin
• Donsitolon = prednisolone + neomycin
• Septomixine = dexamethasone + polymycin sulfate + neomycin
• Cavity liners = 1% prednisolone + 25% chloramphenicol + 50% gum camphor to reduce postoperative thermal sensitivity.

Triamcinolone acetonide is a potent corticosteroid that could be used effectively to eliminate or at least reduce the severe inflammation that might occur secondary to endodontic treatment. The application of corticosteroids to exposed dentine following cavity preparation, in indirect pulp capping, to the exposed pulp or to the pulp remnants and periapical tissue during root canal therapy has been claimed to eliminate postoperative pain and inflammation.\(^13\)

Postherpetic Neuralgia
Systemic steroids reduce pain and disability and had no significant effect on the incidence and severity of the postherpetic neuralgia.\(^30\)

CONCLUSION
Glucocorticosteroids have proven to be the archetypal, double-edged sword of medicine. The risks associated with corticosteroids parallel the benefits of their therapeutic power.

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REFERENCES


