

## Short Communication

# Steroid Estimation in Different Dental Applications

Lubna Iqbal<sup>a\*</sup>, Kauser Siddique<sup>a</sup>, Nighat Afza<sup>a</sup>, Salma Rehman<sup>b</sup>, Afsheen Arshad<sup>a</sup> and  
Mohammad Saleem<sup>b</sup>

<sup>a</sup>PCSIR Laboratories Complex, Shahrah-e-Dr. Salimuzzaman Siddiqui, Karachi-75280, Pakistan

<sup>b</sup>PCSIR Laboratories Complex, Ferozepur Road, Lahore-54600, Pakistan

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**Abstract.** Study of various brands of regular and medicated toothpastes of the local markets of Lahore and Karachi for the presence of steroids revealed the presence of synthetic steroids in medicated toothpastes only while all common, popular brands were devoid of steroids with a few exceptions.

**Keywords:** steroids, cortisone, toothpastes

## Introduction

Toothpaste are generally used by people for cleaning of teeth as well as for other oral health benefits such as for control of caries and plaque and gum health (Fachin and Zaki, 1991). Mouthwashes are also used for the same purpose besides for mouth freshness. Being an excellent vehicle for delivering miscellaneous oral health benefits, in addition to necessary ingredients, many therapeutic agents are generally added to the toothpastes, some of which are stated to be steroids. The use of mild topical steroids can start spontaneous healing of mouth lesions and consequent decrease in the pain. Kenalog is a commonly used topical corticosteroid and dexamethasone is used as rinse for multiple ulcerated areas but usage of both of them requires doctor's prescription (Lehner and Lyne, 1999).

Steroids constitute a class of compounds which are widely distributed in nature and have diverse biological activities such as the development and control of reproductive system and act as cardiotonics (digitoxin), vitamin-D precursors (ergosterols), anti-inflammatory agents (corticosteroids) and anabolic agents (androgens) (Tayler *et al.*, 1988).

The potential benefits and risks of steroids vary with the nature and severity of disease being treated, presence or absence of other alternative treatments and of other significant medical problems. Occurrence of side effects depends upon dose, type of steroid and length of the treatment. Some side effects are more severe than others. (Fields, 2005).

Some common side effects of steroids include weight gain, increase in appetite, sudden mood swings, muscle weakness,

blurred vision, low resistance to infections, osteoporosis, insomnia, nervousness, restlessness, acne, growth of body hair, swollen face, cataract, glaucoma and water retention in the body (Porter and Scully, 2000).

Presently the use of corticosteroids has become a common practice, especially in herbal products, topical applications, beauty creams, soaps and toothpastes etc. to enhance the effect of the product. Use of corticosteroids in toothpastes is gaining attention as these agents have been found to be highly effective in the management of large number of acute and chronic lesions of oral mucosa. (Rosenberg *et al.*, 1997). The present survey of toothpastes was undertaken in response to reports in media about use of steroids in commercial toothpastes and associated risks and side effects.

For the survey, eighteen samples of toothpastes and toothpowders of various brands were purchased from the local markets of Lahore and Karachi. These brands were tested at PCSIR Laboratories at Karachi during 2002 and 2004 using standard methods of AOAC (2000); afterwards, the same brands of toothpaste were obtained from commercial outlets of Lahore and were evaluated for steroids at PCSIR Laboratories at Lahore during June 2004, using standard methods of United States Pharmacopoeia (USP, 2004). Evaluation of commercial samples was carried out using chemical tests, thin layer chromatography, UV spectroscopy and high performance liquid chromatography. All the samples were also tested for tetrazolium blue test according to the British Pharmacopoeia (2003).

In the analysis carried out at PCSIR Laboratories Complex (KLC), presence of synthetic steroids was indicated in the medicated toothpastes, whereas no such compounds were detected in the regular brands. However, only two of the medi-

\*Author for correspondence

**Table 1.** Synthetic steroids in toothpastes tested at Karachi Labs. Complex (KLC) and Lahore Labs. Complex (LLC) in 2002 and 2004

Toothpaste/ toothpowder code	Synthetic steroids (%)		
	KLC (2002)	KLC (2004)	LLC (2004)
K-A/R	-	-	-
K-B/R	-	-	-
K-C/R	-	-	-
K-D/R	-	0.055	-
K-E/R	-	0.510	-
K-F/R	-	-	-
K-G/R	-	-	-
K-H/R	-	-	0.210
K-I/R	-	-	0.334
K-J/M	-	0.085	0.452
K-K/M	0.160	0.054	0.225
K-L/M	0.186	0.280	0.560
K-M/M	-	-	0.304
K-N/M	0.126	0.155	-
K-O/M	-	-	-
K-P/MW	0.346	0.825	0.280
K-Q/M	-	-	-
K-R/M	-	-	0.450

cated toothpaste samples contained steroidal components according to the 2<sup>nd</sup> evaluation carried out at KLC in 2004.

Steroids were found mainly in medicated toothpaste brands of Lahore markets; only one of the regular brands contained steroids. Thus the results of LLC are in general conformity with those of KLC.

For inflammatory conditions of mouth, use of aqueous anti-inflammatory steroids in dentifrices may be recommended for patients. In acute and chronic oral mucosal diseases, such gels are primarily ameliorative or suppressant in their action (Martin *et al.*, 1998). Systematically administered corticosteroids are however, relatively seldom prescribed by dentists, exceptions being in severe allergic reactions or conditions which are more commonly thought of as associated with systemic diseases (Remington, 1970). According to Balch and Balch (1998), 1-2 mg/day of steroids can be used, e. g. orally in pathological conditions. On prolonged use e. g. for months, steroids can cause few or all side effects (Merck, 1999). Some preparations containing corticosteroid dexamethasone are

typically applied for 1-2 days prior to mounting the crown in the mouth, for reducing inflammation (Shannon and Fields, 2007).

It is, therefore, suggested that incorporation of steroids in medicated toothpastes must be mentioned on the label and addition of any type of steroid in regular toothpastes, toothpowders or mouthwashes may be banned and made liable to punishment.

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