

Long Term and Intensive Use of Ophthalmic Topical Corticosteroids and the Risk of Positive Doping Test in Athletes: A Case Report

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Introduction: We express the detection of the prohibited substance prednisone, prednisolone in player's urine sample by long and intensive use eye steroid drops.

Case Presentation: In a rare case in Iranian football, a player's urine sample had corticosteroids. After all investigations, it was demonstrated that systemic effects can be induced by using long-term of ophthalmic prednisone.

Conclusions: It seems to be required to investigate the systemic effects on long term and excessive use of topical corticosteroid drops can have on the result of the sample analysis and showing positive results.

Keywords: Doping in Sports; Glucocorticoids; Topical Administration

1. Introduction

It has been announced by world anti-doping agency that all types of corticosteroid administration including oral, intravenous, intramuscular, and rectal are banned. Yet the use of topical corticosteroid eye drops is not prohibited and does not require submission of TUE (therapeutic use exemption) forms (1). Corticosteroid effects depend on the amount and duration of use (2-12). Some topical ocular medications are associated with an increased risk of systemic adverse reactions (13-19). In this article, we express the detection of the prohibited substance prednisone, prednisolone in the player's urine sample by long and intensive use eye steroid drops.

2. Case Presentation

In a rare case in Iranian football the prohibited substances prednisone and prednisolone were detected in the player's urine sample which was sent to an accredited laboratory of Cologne, Germany for analysis. Since the player was sure that he hadn't used any prohibited substance, he asked for the analysis of the B sample. In all stages of the case investigation the player's emphasis was put on the use of eye drops and nothing else neither as a drug nor as a supplement. Repeated denial of the use of prohibited substances by the player and verification of the player's honesty through the whole process of investigation raised an important question: "Why are the results of the urine samples analysis positive?"

After carrying out different investigatory meetings with the player and hearing all his defenses, the members of preliminary commission together with the sports medicine specialists, pharmacologists, and ophthalmologists studied all medical documents and finally accepted the player's claim for the improper and excessive (intensive) use of prednisolone 1% drops (2 drops of prednisolone for each eye up to 4 times during a day) for 6 consecutive months before the sampling. After all investigations and referring to different medical journals, the members of the committee came to the conclusion that excessive long-term use of ophthalmic topical corticosteroids can produce systemic effects. According to the fact that the player had used 1% prednisolone drop in high dosages and considering the detection of prednisolone/prednisone in the urine sample of the player, systemic absorption of the ophthalmic drugs was probable. Therefore, extensive study of the medical articles resulted in an important finding.

3. Discussion

Topical ophthalmic drops can lead to systemic absorption through nasal mucosa and conjunctiva (13-22). Based on the existing literature on the systemic absorption of corticosteroid eye drops especially in humans and rabbits (20, 21), according to the McGhee article (13), the administration of prednisolone 1% ophthalmic drops

can cause the appearance of prednisolone in plasma and urine. In another study, it is demonstrated that systemic absorption of a topical ophthalmic solution such as dexamethasone disodium phosphate is low (0.1%), but not negligible, and in clinical practice this has not been studied (14). Adrenal suppression may happen by ophthalmologists' extensive use of topical steroids (13). In a case series, after instillation of dexamethasone 0.1% eye drops hourly for 3 days a significant lowering of plasma cortisol level had been shown, demonstrating considerable absorption of ophthalmic dexamethasone (17). In another case, an 11-year-old boy with iridocyclitis developed a cushingoid habitus and acanthosis nigricans after he was treated with prednisolone acetate 1% eye drops every 2 hours for 6 months (18).

Because of the low time of residence of the drug on the ocular surface have it minimally absorbed into the eye (2-10%), but a systemic effect can be induced by the network of conjunctival vessels and via the nasolacrimal duct through the highly vascularised nasal mucosa and may be swallowed and absorbed via the stomach (16). Ocular steroids carry a similar risk of systemic complications (17). Systemic effects of topical ocular medications (except for chloramphenicol) can be due to administering high doses (concentrations) of topical agents and by low bodyweight (19).

The decision was made because the player could establish in this particular case that he had no fault or negligence. Yet, according to FIFA rules, the use of prednisone drops does not need any official consent from physicians (TUE) (1). Therefore, conducting more scientific researches seems to be required for investigating the systemic effects that long term and excessive use of topical corticosteroid drops can have on the result of the sample analysis and showing positive results.

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