

Steroid Eye Drops: Understanding of their Use without Medical Prescriptions and its Complications

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Abstract

Background: From November to February each year, many cases of viral conjunctivitis associate with seasonal flu. In this situation, corticosteroid eye drops, wrongly described as "simple harmless eye drops", are often used without medical prescription. These sometimes cause serious eye damages that can lead to blindness.

Objective: Assess the level of knowledge of pharmacists on steroid eye drops and describe some severe eye complications linked to their inappropriate use.

Methods: This survey was carried out in two sequences from 1st November 2015 – 28th February 2016. In the first sequence, the knowledge of pharmacists of Brazzaville on steroids eye drops was assessed. The evaluation was made using multiple choice question (MCQ) on: indications, and counter-indications, duration of treatment and complications of steroid eye drops use, and its difference with non-steroids anti-inflammatory eye drops. Each correct answer was worth 1 point. The knowledge was judged sufficient if participant scored 5/5 point, average for scores between 3/5 and 4/5 points, and insufficient for scores less than 3/5 points.

The second sequence was a cross-sectional study describing ocular complications due to these eye drops in patients seen at the University Hospital of Brazzaville.

Results: We surveyed a series of 25 pharmacists and 25 patients (25 pathological eyes). 92% of pharmacists had insufficient knowledge on steroid eye-drop use. Ocular complications related to steroid eye-drop use observed were: bacterial corneal abscesses (72%), herpetic uveitis (12%), fungal corneal abscesses (8%), aseptic corneal erosion (4%), corneal perforation (4%).

Conclusion: Ocular complications of steroids eye-drops use can be severe. The regulations on their prescription and dispensary should be more rigorous. The requirement of a medical prescription should be the rule.

Keywords: *Viral Conjunctivitis and Steroid Eye-Drops; Severe Eye Complications*

Introduction

Every year, from November to February, the northern hemisphere observes the winter season (seen the 10/03/2016: <http://www.murielle-baillet.com/fr/les-quatre-saisons.288.html>). In the southern hemisphere, particularly in the equatorial forest zone of Central Africa, this period corresponds to the short rainy season which comes after the long season (seen the 10/03/2016: <http://www.continent-africain.com/republique-du-congo/>). During this period, there is a substantial increase in the number of cases of seasonal flu [1,2]. The flu is usually caused by the Influenza virus [1-3]. The clinical expression and prevalence depends on the pathogenicity of the serotype involved [1-3]. In a number of cases the flu is associated conjunctivitis with clinical severity generally related to that of the casual flu [3,4]. Without any medical prescription, some patients go directly to the pharmacist for remedy. In most of cases steroid eye-drops, wrongly

considered as “harmless as most conventional eye-drops”, are dispensed. These eye-drops sometimes cause serious eye damages that can lead to blindness (seen the 10/03/2016: <http://www.sinquery.com/effets-secondaires-de-steroides-gouttes-oculaires/>). The purposes of this survey were to assess the knowledge of pharmacists on steroids eye-drops on the one hand; and to describe severe ocular complications linked to inappropriate use of steroid eye-drops in some patients on the other hand.

Materials and Methods

This survey was carried out between November 2015 and February 2016. Ten private pharmacies in the city of Brazzaville; and the ophthalmology department of the University Hospital of Brazzaville, were selected for the study. The survey had two components. In the first component, 25 pharmacists recruited from 10 pharmacies in Brazzaville were assessed for their knowledge on steroid eye-drops. It was a convenient sample based on the availability of each participant to respond to multiple choice questionnaire, designed to evaluate the knowledge of pharmacist on steroid eye-drops. Each question had three options and only one was correct. Each pharmacist was seen only once and he (she) had a maximum of one hour to complete the questionnaire. The questionnaire included the following five aspects on steroid eye-drops:

- Indications: the correct answer was “Ocular inflammations”
- Counter indications: the correct answer was “History of ocular herpes”
- Duration of treatment: the correct answer was “Depending on the disease being treated”
- Complications: the correct answer was “Bacterial infections, reactivation of herpes viruses and ocular hypertension”
- Difference between steroid eye-drops and non-steroid anti-inflammatory eye-drops (NSAIED): the correct answer was “NSAIED can be used in cases of ocular herpes history”.

Each correct answer was worth 1 point. The total score was 5/5. The knowledge was judged sufficient if participant scored 5/5 points, average for scores between 3/5 and 4/5 points, and insufficient for scores less than 3/5 points. For confidential reasons, we did not verify the background (diploma of pharmacist) of the agents authorized to sell medicine. So, to simplify this survey we qualified everyone who sold medicine in the selected pharmacies as “pharmacist”.

In the second component of our study, we surveyed 25 patients at the ophthalmology department of the University Hospital of Brazzaville, seen for ocular complications resulting from steroid eye-drop use, following seasonal viral conjunctivitis. Only patients who applied monotherapy steroid eye-drop were retained. We excluded patients who used other eye drops in addition to steroid eye-drops, or eye drops containing a steroid and another active ingredient. We also excluded patients with ocular pathology other than seasonal viral conjunctivitis and all immunocompromised patients regardless of the cause.

The diagnosis of herpetic uveitis was made on the basis of strong clinical suspicion in the presence of the combination of the following signs: corneal hypoesthesia, ocular hypertension and sectoral iris atrophy. In case of corneal injury, a smear was systematically collected and culture done on the usual medium (Blood, Chocolate, Sabouraud).

Results

The average age of pharmacists was 42 years [33 years - 59 years]. The average age of patients was 28 years [19 years - 40 years]. The sex ratio of pharmacists and patients were respectively 1.2 and 1.1. The answers to the various questions are shown in Table 1. Table 2 shows the complications observed.

Multiple choice question	Answer / Number	Frequency %
Indications*	Correct / 1	4
	Incorrect / 24	96
Against indications	Correct / 1	4
	Incorrect / 24	96
Duration of treatment	Correct / 2	8
	Incorrect / 23	92
Complications	Correct / 4	16
	Incorrect / 21	84
Difference between steroid eye drops and NSAIED	Correct / 2	8
	Incorrect / 23	92

Table 1: Evaluation of knowledge level of 25 pharmacists of Brazzaville on steroid eye drops, survey conducted between November 2015 and February 2016.

*96% of pharmacists had confused "red eye" and "ocular inflammation".

Complication	Number	Frequency %
Bacterial corneal abscesses	18	72
Herpetic uveitis	3	12
Fungal corneal abscesses	2	8
Aseptic corneal erosion	1	4
Corneal perforation	1	4
Total	25	100

Table 2: Ocular complications observed in 25 patients (25 eyes) in the ophthalmology department of the University Hospital of Brazzaville after using steroid eye drops without medical prescription, survey conducted between November 2015 and February 2016.

Pseudomonas aeruginosa was found in 100% of cases, *Candida albicans* was responsible for two cases of fungal abscesses. No co-infection bacterium-fungus had been highlighted.

Discussion

Steroid eye-drops induce depression in immunity locally, which promotes the proliferation of germs which sometimes are not part of the natural ecology of the ocular surface [5,6]. Infections including corneal abscesses can then occur easily. *Pseudomonas aeruginosa* was the only germ found in bacterial abscess diagnosed.

How could we explain the preponderance of this enterobacterium which is usually cited as one of the leaders of nosocomial infections? None of the patients was hospitalized and their treatment was conducted on outpatient basis. Although the exact mechanism is still debatable and has not found consensus, it may likely be similar if not very close to the explanation given for the predominance of enterobacteriaceae related keratitis among contact lenses' wearers. It is well known that the ecology of germ on the ocular surface is different between the contact lenses' wearers and the non-wearers [7,8]. The enteric bacteria especially *Pseudomonas* predominates in the first group while *Staphylococcus* is the main bacterium in the second group.

Reactivation of herpes virus family in case of immunosuppression is well known [9,10]. Most often patients are unaware that they are carriers of this virus. The primary infection often go unnoticed as a phlyctenular conjunctivitis which heals without sequelae.

The local immunosuppression also explains keratitis due to *Candida* in two participants. *Candida* related keratitis is not exceptional in countries where the climate is hot and wet [6,11].

Aseptic corneal erosion and perforation are probably due to, failure of wound healing due to steroid action, in a context of local immunosuppression [12].

Steroid eye-drops are necessary for the treatment of many inflammatory diseases. However, their use should be better regulated especially in developing countries. Those eye-drops can also cause severe systemic damages. One case of Cushing's syndrome and another one of psychiatric disorders due to their use have been reported [13,14]. Congo-Brazzaville is not the only country with insufficient number of pharmacists. This situation is probably similar in most poor countries in the world. Often drug sellers who play the role of pharmacists have as only training the passage of some delegates from pharmaceutical companies. These delegates are commercial agents, who brag of the efficiency and safety of their medicines sometimes without knowing themselves the exact mechanisms action of the pharmacological active ingredient.

Conclusion

Steroid eye-drops wrongly qualified "simple eye-drops" may be responsible for severe eye complications that can lead to blindness. The regulations on their prescription and dispensary should be more rigorous. The requirement of a medical prescription should be the rule.

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