

INTRODUCTION

Most eye drops in the market contain preservatives to prevent contamination and subsequent infections if instilled into the eye over multiple discrete times.¹Among the first classes of preservatives used were the quaternary ammonium compounds,¹ to which belongs Benzalkonium chloride (BAK), the most commonly used preservative in eye drops.² Preservative-free eye drops offer the advantage that no irritation or allergies will occur in patients with sensitive or damaged eye surface such as in dry eye syndrome or after major eye surgery (e.g., cataract) or in glaucoma patients requiring the long-term use of eye drops.⁵

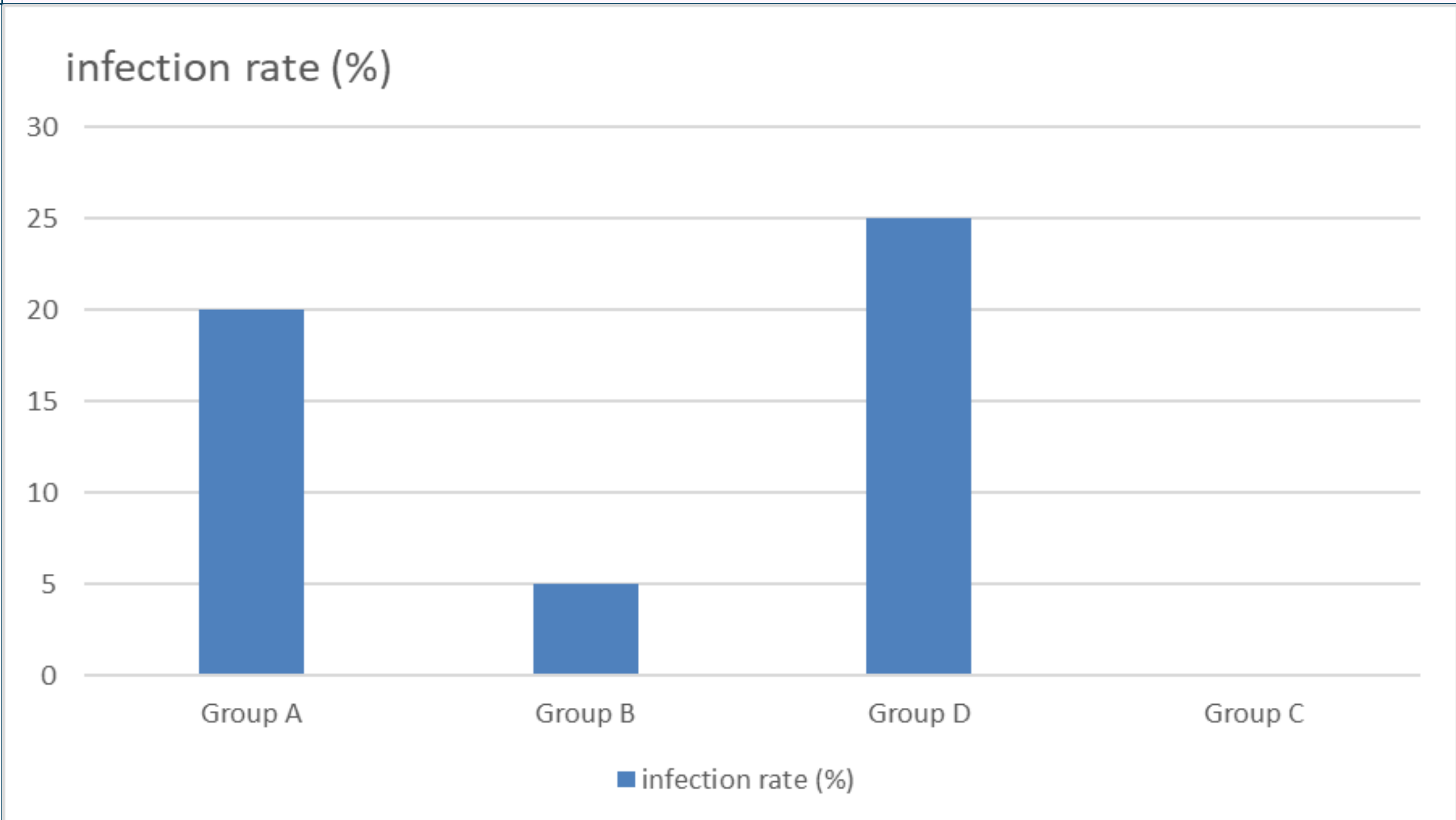


Figure 1. Infection rates in the different groups. Significant difference was seen in the infectious rate between groups D and C (p= 0.04) but not between groups A and C (p= 0.10) and groups B and C (p=1).

RESULT(S)

Microbial contamination of preservative-free Tafluprost vials based on what touched the vial tip.

Group ID	n	Contaminated (n, %)	Identified Contaminant (n, %)
A	20	17(85%)	CoNS (13, 65%), Staphylococcus aureus (2, 10%), Gram negative (2, 10%)
B	20	20(100%)	CoNS (19, 95%), Staphylococcus aureus (1, 5%)
D	20	20(100%)	CoNS (15, 75%), Staphylococcus aureus (2, 10%), fungi (3, 15%)
C	20	1(5%)	CoNS (1, 5%)
Total	60*	57(95%)	

*Total is 60 not 80 vials because the vials in group C (control) were not instilled.

OBJECTIVE(S)

The primary objectives of this study are:

- To examine commercially available preservative-free eye drops used for treatment of glaucoma (Tafluprost/Teflopro®) for contamination after applying different instillation techniques.
- Assessment & cost effectiveness for preservative free, non-antibiotic, and single dose eye drops, to evaluate is it possible and safe to reuse the remaining of unit-dose preservative-free eye drops on a second day.

METHOD(S)

80 vials of Tafluprost/Teflopro® were collected randomly from retails, each contains 0.3 ml labeled with a unique number, and kept in a suitable room temperature before the study.

The eighty vials were divided into four groups A, B, C, and D according to the instillation technique, 20 eye-drops containers were dedicated for each group. Group A started the study by opening the containers and dropping one drop of drug without touching, group B went through the study by opening the container and let the eye drop to touch the eyelids, group D opened the containers and allowed the fingertip to get in touch with the eye drop.]The remaining 20 vials were kept away from any touch and considered as control group C.

On the 10th day of incubation, the suspected negative thioglycolate broth was incubated for 48 to 72 h by performing blind sub-cultivation on the MacConkey agar, TSB (Tryptic Soy Broth) agar, TSA (Tryptic Soy Agar), MSA (Mannitol Salt Agar), sabouraud dextrose agar, and blood agar. The culturing technique used was streaking method (Streak Plate Method) which is used to isolate bacteria in order to get it prepared for counting.

For the sensitivity analysis decision tree were held according to best case scenario and worst-case scenario. Best case being that all bacteria that are considered pathogenic and commensal not reaching the infectious stage following their low contamination percentage and only other bacterial that are pure pathogens are considered to cause bacterial infectious diseases like conjunctivitis, keratitis, and endophthalmitis which require antibiotic to treat the infected eye.

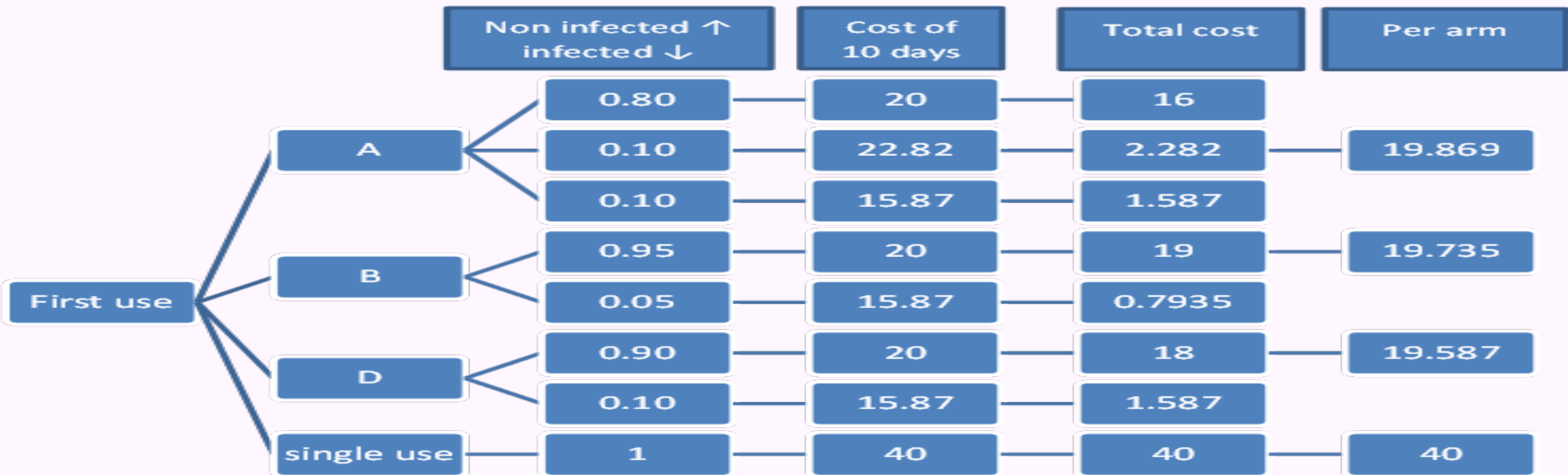


Figure 2. Decision tree for normal case. First column includes the possibility of infection with possibility of no infection is top and possibility of infection is bottom (for Group A, top is no infection possibility and the other two branches are possibility of infection.)

CONCLUSION(S)

- Reusing the preservative free Tafluprost is feasible
- Rate of contamination is high but possibility of infection is low
- Reusing should be accompanied with correct installation and reservation
- Other advantages not studied as resource saving & reduce impact of drug shortage
- Real world evidence is needed

For conclusion, the value of this study, being first of few to discuss this topic, is in the saving that it might show specially with the crises not only financially but also in supply of the medications & future possible work that is based on getting a real-world sample that resembles the actual reality.

In case we decided to make another study in the same point, we recommend to use 2 different types of eyedrops perhaps with more solution inside the vials and alter the duration between opening the vial for the first time and culturing the residuals.

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