Lidocaine Cyclodextrin complex Ophthalmic Drop, a New Topical Anesthetic Choice

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Abstract

Background: Topical anesthesia is a safe and cost-effective method considered as the first-choice in many procedures. Due to the physiological characteristics of eye, most of the local anesthetics cannot efficiently penetrate through the conjunctiva deep to tenon. The aim of this pilot study was to find a new form of lidocaine to give a sufficient level of anesthesia.

Methods: Lidocaine Cyclodextrin complex ophthalmic drop was produced and its pharmacological properties were studied in standard temperature and pressure. 30 patients (18 males, 12 females) with the mean age of 30.68±8.02 years enrolled in this clinical trial. All the patients were fully informed and signed the ethics committee consent forms. The patients were given tetracaine drop as the anesthetic: 3 drops separated 2 minute apart 10 min before the intervention. If we achieved a sufficient level of anesthesia, the procedure was done after. If the patient could not tolerate the procedure, the method was changed to lidocaine drop (administered after wash-out period like the first drop). The last option was conventional injection method if the patient could not tolerate the procedure with the second method either. We used this type of anesthesia for conventional procedures such as forced duction test, symblepharon, pterygium, and disjoint injection into extra-ocular muscles. All the procedures were done by one surgeon in a university hospital. We used a 0 to 10 visual analogue scale for pain and two 0 to 4 patient and physician satisfaction scales designed for this study.

Results: The mean pain score was 7.53±0.90 in group 1 and 3.03±1.83 in group 2 (P=0.00). Patient and surgeon satisfaction in group 1 were 1.33±0.48 and 1.40±0.56 respectively; while 3.23±1.00 and 3.56±0.77 for group 2 (P=0.00). Tetracaine drop could not induce sufficient anesthesia for none of the patients. Cyclodextrin based lidocaine drop was successful except for two patients for whom we changed the anesthesia to Sub-conjunctival injection method.

Conclusion: Our newly manufactured cyclodextrin based lidocaine eye drop could successfully induce sufficient anesthesia for 28 of 30 patients. Further studies with larger sample sizes are now being designed to find more clinical evidence about this method.

Keywords: Drug Delivery, Lidocaine, Cyclodextrin, Ophthalmic drop, Pterygium, Symblepharon, Dysport

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Introduction

Premature medicine. Nowadays, lifestyle improvement and reduction of patients’ pain and suffer is one of the most important physicians’ goals.