ORIGINAL ARTICLE

SUBSTANTIATION OF SUBSTITUTION THERAPY MEDICATION FOR DRY EYE SYNDROME TREATMENT IN PATIENTS USING CONTACT LENS VISION CORRECTION

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ABSTRACT

The aim: To substantiate the selection of a substitution therapy medication for dry eye syndrome treatment in patients wearing different kinds of contact lenses.

Materials and methods: A structural analysis of the assortment of substitution therapy medications for dry eye syndrome treatment as well as a content analysis of the information given in the labelling claims of various substitution therapy medication was conducted. Than they were segmented using the criteria of whether the substitution therapy medications may be used in patients with dry eye syndrome who wear contact lenses.

Results: The labelling claims of 82.36% substitution therapy medications registered in Ukraine assortment contain information on either full or partial compatibility with contact lenses. The use of 11.76% of the assortment is impossible for patients wearing soft contact lenses, while patients wearing hard contact lenses need to wait for some period of time (15-20 min) before putting contact lenses back on.

Conclusions: The pharmaceutical market of Ukraine is characterized by a wide assortment of substitution therapy medications for dry eye syndrome treatment, which can be used in patients wearing contact lenses. Based on the data received, it has been determined that 70.59% of substitution therapy medications are compatible with contact lenses of all types and only the use of 8.82% of the substitution therapy medications assortment is contraindicated for dry eye syndrome treatment in patients wearing contact lenses.

KEY WORDS: dry eye syndrome, contact lenses

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INTRODUCTION

Currently, the use of contact lenses (CL) is one of the two most widely spread methods of vision correction in patients with various kinds of ametropia. Wearing glasses and CL are not only the desire of the patients, but also a necessity in order to be able to do certain kinds of work. CL have a number of benefits as well as certain limitations and disadvantages, all which in the end determines the patient's personal choice of a vision correction method.

According to the latest data presented by World Health Organization (WHO), 2% of the global population – and this is about 130 million people on our planet – wear CL. The average age of a CL wearer is 31 years and over 60% of the wearers are women [1].

The current statistics on wearing different kinds of CL is the following: 42% of the patients wear 1-month lenses, 29% of the patients wear 1-2-week lenses, 17% - 3-month and long-term wear lenses, 12% - 1-day lenses [2]. A small percent of patients wearing 1-day lenses is directly linked with their price if calculated for a year of use. Silicon-hydrogel as well as hydrogel, hybrid and hard gas permeable CL are presented on the market of Ukraine. CL has a number of peculiarities. As a CL, in its nature, is perceived by the eye surface as a foreign object, it has to be thoroughly selected by a number of key parameters in order to minimize the risks and consequences of long-term wear of CL for the cornea surface.

The most often side effect of long-term wear of CL is the dry eye syndrome (DES) – a complex of complaints associated with tear film disorders, namely its quantitative and qualitative composition [3]. Treating DES patients is held using a wide spectrum of substitution therapy medications (STM) that are present on the national market [4–8]. The most frequent complaints in DES are transitory redness of the conjunctiva, itching, burning, foreign body sensation in the eye, blurred vision, eye fatigue [9–10]. Very often, these symptoms develop gradually, during a few years' period, they occur episodically, but they tend to become more frequent and more intense. The wearing schedule, timely replacement and the presence of an accompanying pathology all play a crucial role.

Sometimes, this complex of symptoms makes the patient stop wearing soft CL and shift to wearing glasses, which is not always an equal substitution. Taking into consideration the fact that, according to the WHO data, 45% of CL wearers are patients aged 26-39 years, i.e. the active working age population, DES development in this category of patients may negatively influence their workability and quality of life, thus having a global economic effect [1,4,10].

Use of STM while wearing CL may be both preventative as well as healing. DES development prevention may be divided into active and passive. Passive prevention includes observation of the wearing schedule and timely lenses'

replacement, selection of SCL made of modern materials that have a high Oxygen permeability index as well as use of protective glasses or screens while working in hazardous conditions (dust, wind, volatile chemical substances). Active prevention includes constant or periodical use of eye drops for additional humidification of the eye surface and creation of a protective film, which, in turn, decreases the potential risk of irritation of corneal nerves, Meibomian gland function disorder and the decrease of mucin production by goblet cells of the conjunctiva [4,9].

In addition, there often is a need to use STM as the stage, when DES has already developed. In this case, DES may not only be the side effect of wearing CL, but also a concomitant disorder of the refractory of cataract ophthalmic surgery [3,10].

THE AIM

Taking into consideration everything stated above, the aim of the paper is to study the possibility of using STM while wearing CL, their compatibility as well as to substantiate the selection of an STM for DES treatment in patients wearing different kinds of CL.

MATERIALS AND METHODS

In the course of the first stage of the study, we conducted a structural analysis of the assortment of STMs for DES treatment as well as a content analysis of the information given in the labelling claims ('instruktsiya dlia medychnoho zastosuvannia likarskoho zasobu', 'instruktsiya po vykorystanniu medychnoho vyrobu' and 'instruktsiya iz zastosuvannia') of various STMs. At the next stage they were segmented using the criteria of whether the STM may be used in patients with DES who wear CL. The research was conducted using biblio-semantic, information-analytical and the statistical methods. The styudy was perfomed according to the basic bioethical requirements and fundamental guidelines of the Helsinki Declaration. Not a single patient was involved in the study.

RESULTS

It should be noted that of 34 STMs registered in Ukraine, the labelling claims of 82.36% assortment contain information on either full or partial compatibility with CL (Figure 1).

Thus, 24 different STMs are fully compatible with all kinds of CL and 79.17% of those do not require taking CL off for the instillation of the STM. These are such STMs as KRAPLI OCHNI AY-TI EKTOIN 0.5 ml ampulla, No.10, KRAPLI OCHNI AY-TI EKTOIN PRO 0.5 ml ampulla, No.10, KATIONORM KRAPLI OCHNI 10 ml emulsion, No.1, TEALOZ® DUO ROZCHYN OFTALMOLOHICHNYI 10 ml vial, sterile, No.1, OPTINOL 0.21% or 0.4% eye drops 10 ml, OPTINOL® INTENSYV eye drops 10 ml No.1, AKVILA KRAPLI OCHNI eye drops 0.18 % polymer container 0.4 ml, sterile, No.10, VIZILOTON ZASIB OFTALMOLOHICHNYI 10 ml, No.1, OKUTIARZ eye drops 10 ml vial, No.1, UNITIRS eye drops 10 ml vial, No.1, OKUKHIL C KRAPLI OCHNI ZAKHYSNI solution 10 ml, No.1, KHILO-KOMOD eye drops 1 mg/ml, 10 ml in a multi-dose container, equipped with an air-tight pipe and closed with a cap, 1 container in a card box, KHILO-KOMOD FORTE eye drops, 2 mg/ml, 10 ml in a multi-dose container, equipped with an air-tight pipe and closed with a cap, 1 container in a card box, SYSTEIN ULTRA ZASIB DLIA ZVOLOZHENNIA OCHEY 10 ml vial. No.1, 0.7 ml container, No.30, ZASIB DLIA ZVOLOZHENNIA OCHEY SYSTEIN® gel solution 10 ml No.1, SYSTEIN AKVA ZASIB DLIA ZVOLOZHENNIA OCHEY 10 ml, No.1, ZASIB D/ZVOLOZHEN. OCHEY SYSTEIN 10 ml vial, No.1, VIAL® SLIOZA drops 10 ml polyethylene vial, No.1.

The use of 11.76% of the assortment (4 different STMs) OFTAGEL®, ocular gel, 2.5 mg/g, 10 g in a vial; 1 vial in a card box, OFTAGEL® UNO ocular gel, 2.5 mg/g, HIPROMELOZA-P, eye drops 0.5%, 10 ml dropper-container, No.1, OFTOLIK eye drops, 5 ml or 10 ml in a plastic dropper-vial; 1 dropper-vial in a card box) is impossible for patients wearing soft CL, while patients wearing hard CL need to wait for some period of time (15-20 min) before putting CL back on.

Patients with DES may not take off hard CL, if they use ARTELAK® eye drops, solution, 3.2 ml/mg 10 ml in a vial with a dropper; 1 vial with a dropper in a box and ARTELAK® SPLESK ROZCHYN ZVOLOZHUYUCHYI DLIA OCHEY I KONTAKTNYKH LINZ 0.24 % solution, 10 ml vial, No.1 whereas soft CL should be taken off before the application of the medicine and can be put back on not earlier that 15 minutes after the instillation.

It has been determined that the structure of the STM assortment for DES treatment in patients wearing CL is presented on the market by four groups. The largest number of STMs compatible with CL – both in absolute as well as in relative figures – is present in the group "Drugs for ophthalmological use" ('Zasoby dlia oftalmolohichnoho vykorystannia') registered as "Medical Products" ('Medychni vyroby') (03. Ophthalmological and optical products ('Oftalmolohichni ta optychni vyroby')) – 14 different STMs (58.33%). The second position is occupied by the group "Solutions for washing, wetting, treatment" ('Rozchyny dlia promyvannia, zroshennia, likuvannia') – 5 STMs (20.83%). The third place belongs to 4 medicines from the group S01X A20 – Artificial substitutes of tear liquid and other neutral medicines ('Shtuchni zaminnyky sliznoyi ridyny ta inshi neytralni preparaty') (16.67%), the fourth place goes to a multi-purpose solution ARTELAK® SPLESK ROZCHYN ZVOLOZHUYUCHYI DLIA OCHEY I KONTAKTNYKH LINZ 0.24 % solution, 10 ml vial, No.1.

Such STMs as LAKRISEK OFTA PLUS eye drops, 8 ml vial, sterile, No.1, VIDISIK ocular gel 0.2%, 10 g in a tube; 1 tube in a card box, SIKAPOS ocular gel, 2 mg/g, 10 g in a tube, 1 or 3 tubes in a box are incompatible with CL and make up 8.82% of the assortment.

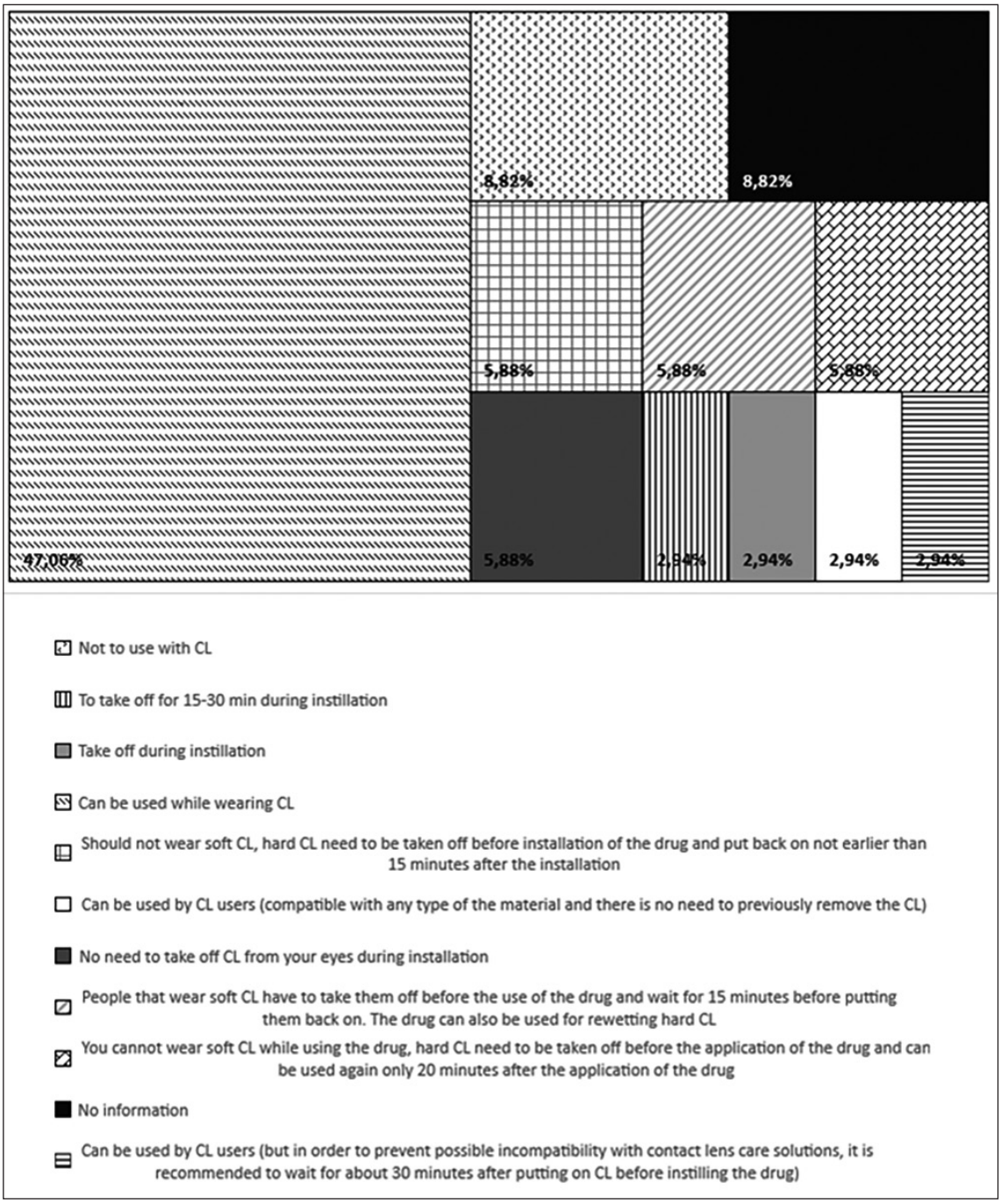

Fig. 1. Segmentation of substitution therapy medications using the criteria of whether they may be used in patients with dry eye syndrome who wear contact lenses

DISCUSSION

Most studies focus either on contact lenses as a factor that triggers the development or escalation of the dry eye syndrome symptoms [11–13] or on the efficiency of the use of substitution therapy medications (namely, eye lubricants / artificial tears) to decrease the discomfort while wearing contact lenses [14–16]. At the same time, we studied the possibility of STM application in patients using contact correction of eyesight as well as the compatibility of various medications used for DES pharmacotherapy with different types of contact lenses.

It has been determined that the structure of the STM assortment for DES treatment in patients wearing CL is presented on the market by four groups. The largest number of STMs compatible with CL – both in absolute as well as in relative figures – is present in the group "Drugs for ophthalmological use" ('Zasoby dlia oftalmolohichnoho vykorystannia') registered as "Medical Products" ('Medychni vyroby') (03. Ophthalmological and optical products ('Oftalmolohichni ta optychni vyroby')) – 14 different STMs (58.33%). The second position is occupied by the group "Solutions for washing, wetting, treatment" ('Rozchyny dlia promyvannia, zroshennia, likuvannia') – 5 STMs (20.83%). The third place belongs to 4 medicines from the group S01X A20 – Artificial substitutes of tear liquid and other neutral medicines ('Shtuchni zaminnyky sliznoyi ridyny ta inshi neytralni preparaty') (16.67%),

the fourth place goes to a multi-purpose solution ARTELAK® SPLESK ROZCHYN ZVOLOZHUYUCHYI DLIA OCHEY I KONTAKTNYKH LINZ 0.24 % solution, 10 ml vial, No.1.

Such STMs as LAKRISEK OFTA PLUS eye drops, 8 ml vial, sterile, No.1, VIDISIK ocular gel 0.2%, 10 g in a tube; 1 tube in a card box, SIKAPOS ocular gel, 2 mg/g, 10 g in a tube, 1 or 3 tubes in a box are incompatible with CL and make up 8.82% of the assortment.

Special attention should be paid to STMs, namely, to SHTUCHNI SLIOZY eye drops, 5 ml, or 10 ml, or 15 ml in a "Drop-Tainer®" dropper vial; 1 dropper-vial in a box made of card, SUPEROPTIK AKVA eye drops 5 ml vial, No.1, 2, OPTIVE® eye drops in 3 ml, 10 ml, 15 ml dropper vials No.1, the labelling claims of which do not contain any information regarding the possibility of their use by the patients wearing CL.

CONCLUSIONS

Thus, it has been determined that the pharmaceutical market of Ukraine is characterized by a wide assortment of STMs for DES treatment, which can be used in patients wearing CL. Based on the data received, it has been determined that 70.59% of STMs are compatible with CL of all types and only the use of 8.82% of the STM assortment is contraindicated for DES treatment in patients wearing CL.

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The Authors declare no conflict of interest.

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