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EYE CHANGES WHEN WEARING SOFT CONTACT LENSES FOR A LONG TIME AND THEIR TREATMENT TACTICS

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Abstract: Soft contact lens fitting and wearing require the choice of the most appropriate contact lens parameters considering external factors and patient's needs. Breaking one or several conditions may alter normal eye physiology in terms of both functions and anatomy and result in contact lens induced dry eye. Currently, there are numerous agents to prevent tear film instability and to improve the ocular surface. Preservative-free hyaluronic acid-containing tear substitutes of low viscosity are recommended to prevent ocular discomfort in eyes wearing soft contact lenses. When the effect of tear substitutes of low viscosity is scarce, 5% dexpanthenol gel-containing product is recommended to treat superficial corneal abrasions and to improve epithelial healing.

Keywords: Soft contact lenses, dry eye, tear film, hyaluronic acid, dexpanthenol, Corneregel.

Annotatsiya : Yumshoq kontaktli linzalarni (YKL) muvaffaqiyatli tanlash va qulay taqish kontakt linzalarining eng mos parametrlarini tanlashni, shuningdek, tashqi omillar va bemorning talablarini hisobga olishni talab qiladi. Ushbu shartlarning bir yoki bir nechtasini buzish ko'zning normal fiziologiyasini funktsional va tizimli ravishda o'zgartirishi mumkin, bu esa YKL taqish natijasida kelib chiqqan sun'iy (ikkilamchi) quruq ko'z sindromining rivojlanishiga olib keladi. Hozirgi vaqtda ko'z yoshi plyonkasi barqarorligi buzilishining oldini olish va kontakt linzalarini uzoq vaqt davomida taqish paytida ko'z sirtini davolash uchun vositalarning yetarlicha katta arsenali mavjud. Profilaktika chorasi sifatida, YKL kiyganda noqulaylik paydo bo'lishining oldini olish uchun gialuron kislotasi (HA) asosli

ko'z yoshi o'rnini bosuvchi vositalardan foydalanish tavsiya etiladi. Agar gialuron kislotasi (HA) asosli ko'z yoshi o'rnini bosuvchi moddalarning ta'siri yetarli bo'lmasa, epiteliy qatlamining yuzaki nuqsonlarini davolash va epitelizatsiyani tezlashtirish uchun 5% dekspantenol geli asosida korneoprotektor qo'shilishi tavsiya etiladi.

Kalit so'zlar: Yumshoq kontakt linzalar, "quruq ko'z" sindromi, ko'z yosh plyonkasi, gialuron kislota, dekspantenol,kornergel.

Relevance

Soft contact lensessuitable parameters of contact lenses (CL) for successful selection and comfortable wearing, such as material (moisture, oxygen permeability) and shape (edge, curvature of the base, asphericity), corresponding to the characteristics of the eye surface, as well as external factors and it is necessary to take into account the requirements of the patient. Practice shows that an individual approach to each patient ensures optimal adaptation of CL and high visual acuity.

Disruption of one or more of these conditions can alter the normal physiology of the eye (structurally and/or functionally), resulting in the inability to accept CL together with the presence of clinical signs of discomfort when wearing CL.

More than 140 million people worldwide use CL to correct refractive errors, and this number has remained stable over the past decade despite the continuous development of new technologies to improve the quality of CL. It is estimated that 10% to 50% of patients refuse to wear CL within 3 years of starting use. However, the most common reason is the discomfort of wearing CL, which approximately 70% of patients experience at the end of the day. Among the reported symptoms, dry eye is the most common - in about 40% of cases, 25% of patients suffer from severe dry eye syndrome (DES), which leads to reduced vision. These statistics show that

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SCL's The interaction with the surface and the tear film contributes to the development of artificial (secondary) DES associated with wearing SCL. Considering the above, it is necessary to take into account physiological factors that make patients unable to accept SCL.

Factors of inadmissibility of SCL

Corneal epitheliopathy (damage to the surface epithelium) that occurs when wearing CL causes a decrease in the protective function of the epithelium and increases the risk of infectious diseases. Defects in the epithelial layer can serve as entry doors for infectious agents. In addition, long-term use of CL can cause a toxic-allergic effect on the cornea, a reaction to CL material, care products and deposits on lenses. In this context, good CL mobility is essential. Provides sufficient tear exchange in the space under the lens, which allows for timely washing of sediment, detritus and degradation products to minimize the risk of an inflammatory reaction.

Significant changes in the corneal epithelium and stroma can also occur in response to long-term hypoxic stress that occurs when wearing CL. In vivo histomorphological study of the characteristics of the cornea in patients using SCL for a long time revealed hypoxic keratopathy, characterized by various degrees of impairment from functional to degenerative. Studies have shown that hypoxia causes accumulation of lactic acid and carbon dioxide, which stimulates corneal neovascularization and limbal vessel dilation. Superficial neovascularization is a relatively common complication of long-term wear of CL. As a rule, it is asymptomatic and disappears when the use of SCL is stopped. At the same time,

SCL completely covers the cornea and covers the conjunctiva of the eyeball about 2 mm beyond its border. Each eye opening and closing causes the lens to move across the surface of the eye. Metaplasia of the conjunctival epithelium was found in patients with a background of long-term wearing of contact lenses, in which the cells multiply and have a smoother shape, which indicates the negative effect of mechanical friction. In addition, it was found that the density of goblet cells decreased after the start of the use of eye drops, and negative dynamics were noted after 3-6 months. This is because the goblet cells produce mucin, which forms the inner layer of the tear film and ensures its adequate adhesion to the corneal epithelium. , a decrease in its production leads to a violation of the stability of the tear film. At the same time, it should be noted that this effect is reversed after stopping wearing the lenses.

In addition, some researchers distinguish the slippery edge of the eyelid as a part of the marginal conjunctiva of the upper eyelid, which slides on the surface of the eye or CL during the blink. Epitheliopathy of the slippery edge of the eyelid is visible by staining with vital dyes and is detected in 85% of patients who use CL and complain of discomfort when wearing CL. The stability of the tear film is one of the most important conditions for successful and safe wearing of CL is one. This structure is the first protective barrier that ensures surface wetness and sufficient CL hydration. When worn, the lenses interact with the tear film secretes and divides it into anterior and posterior parts of the lens. This leads to thinning of lipid and mucin layers and increased evaporation of moisture from its aqueous layer. According to Efron et al, the thickness of the aqueous layer covering the CL does not exceed 2-3 mkm, and the lipid layer is very thin or absent.

The role of mechanical friction in discomfort when wearing ICL is enhanced when the lens contacts the corneal glycocalyx. This is a hydrophilic barrier formed by the first type of transmembrane mucins associated with the epithelial membrane: MUC1, MUC4, MUC16. They are attached to long molecules of soluble mucins, MUC5AC, MUC5B, MUC7, etc. (the second type), which form a mucin gel on the surface of the epithelium. Studies have shown that the corneal glycocalyx plays a key role in reducing friction during blinking and stabilizing the tear film of the eye. Later, the homeostasis of the mucin layer, which is one of the factors in the development of the inability to receive CL by changing, CL proved to break this natural depreciation mechanism. In addition, long-term wearing of eye drops leads to a decrease in the stability of the tear film due to the disruption of the normal functioning of the lipid layer, which

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reduces the hydration of the lens itself and the surface of the eye; increases friction and closes the range of pathological changes. In addition to the changes in the biochemical and biophysical state of tears, tear film rupture time is reduced in patients who wear long-term SCL. Comparison of non-invasive and fluorescein-measured tear film break-up times showed that patients who successfully wore SCL successfully wore SCL, as opposed to patients who experienced severe discomfort when wearing SCL due to dry eyes.

Patients who reported discomfort while wearing CL had a reduced tear film breakup time and less lens tear film coverage between blinks. Early identification of patients with decreased tear film breakup time and improved tear film quality may reduce dry eye problems with SCL and therefore prevent discontinuation.

Prevention of changes in the tear film and treatment of the surface of the eye during long-term wearing of CL

First of all, careful monitoring of patients using SCL is necessary for early detection of signs of damage to the ocular surface or disruption of the stability of the tear film. Although patients are not required to visit a physician to purchase a SCL, it is important to explain this as a measure to prevent the development of discomfort and future inability to accept while wearing the SCL. Regular examinations by a qualified ophthalmologist extend the period of comfortable use of contact lenses and prevent possible complications. During the patient's visit, ophthalmologists are recommended to evaluate the mobility of CL, study the condition of the tear film, paint the surface of the eye and the edges of the eyelid with vital dyes, and examine the meibomian glands. In addition, it is necessary to determine the presence of risk factors, for example, a toxic-allergic reaction to lens materials or care products. Currently, new materials with high gas permeability are used for the production of CL, which allows to reduce the level of negative effects of CL on the eye and reduce the risk of possible complications. Unfortunately, new materials and improved design of CL cannot solve all the problems that arise during their use, which necessitates the creation of a drug protection (protection) system using tear substitutes and corneotrophic agents. Adverse effects of SCL on structures in the front of the eye it is also recommended to use them for preventive purposes to reduce the secretion. Taking into account the correlation between the discomfort of wearing SCL and clinical signs such as conjunctival staining, eyelid epitheliopathy, meibomian gland dysfunction and blinking frequency decrease, ignoring the negative role of CL rubbing on the eye surface notIn this regard, the appointment of moisturizing eye drops is of particular importance in preventing the negative consequences of the mechanical effects of the eye.

The effectiveness of the use of various lubricants in the form of eye drops has been studied in many studies. The emergence of drugs that do not contain preservatives that have a toxic effect on the epithelium, as part of tear replacement therapy, has significantly increased the possibility of prolonging the comfortable wearing of eye drops. In addition, moisturizing drops containing biodegradable preservatives appeared, which are less harmful to the surface of the eye compared to benzalkonium chloride. An option for safe use of tear substitutes when wearing CL is to use them in monodoses (small drops). Also, in order to maintain the sterility of currently opened vials (5-10 ml), several variants of dropper dispensers for reusable instillation have been developed, which allow to increase the shelf life of the solution after opening. Longest shelf life (up to 6 months) for preservative-free Ocutiars moisturizing solution to date. According to physical properties, two groups of tear replacement therapy are distinguished: low viscosity and high viscosity gel-based preparations. Among low-viscosity preparations, the attention of contactologists is drawn to preparations based on hyaluronic acid (HA). In connection with this fact, during randomized trials, this group of agents showed a high efficiency in the relief of DES. According to the chemical structure, HA is sulfate is a glycosaminoglycan that is a natural component of eye tissue, a part of the vitreous body and an integral part of tears. HA is present in the cornea (one of the important components of the extracellular matrix), affecting the

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physiological processes of its hydration. It helps heal corneal ulcers by stimulating the migration of corneal epithelial cells. HA is able to bind and retain a large amount of water due to hydrogen bonds, and at the same time, it is a stimulator of regeneration processes and improves the condition of the cornea and conjunctival epithelium. HA is present in the cornea (one of the important components of the extracellular matrix), affecting the physiological processes of its hydration. It helps heal corneal ulcers by stimulating the migration of corneal epithelial cells. HA is able to bind and retain a large amount of water due to hydrogen bonds, and at the same time, it is a stimulator of regeneration processes and improves the condition of the cornea and conjunctival epithelium. HA is present in the cornea (one of the important components of the extracellular matrix), affecting the physiological processes of its hydration. It helps heal corneal ulcers by stimulating the migration of corneal epithelial cells. HA is able to bind and retain a large amount of water due to hydrogen bonds, and at the same time, it is a stimulator of regeneration processes and improves the condition of the cornea and conjunctival epithelium.According to research, the optimal concentration of HA in moisturizing drops is from 0 to 1 to 0.3%. When the content of the main active substance increases by more than 0.3%, the viscosity of the ophthalmic solution increases, which may cause discomfort to patients. In this regard, the line of Ocutiars products is interesting and includes 2 solutions with different concentration of HA, which allows to choose the most suitable tear substitute for each clinical situation . Okutiars is a preservative-free drug with HA concentration0.15%, which are tear substitutes officially registered in Uzbekistanis almost the highest indicator among them. It is advisable to prescribe it as a prevention of the development of discomfort when wearing CL. HA 0.15% solution increases the vitality of corneal cells by attracting water molecules, which together with the protector provides a double wetting mechanism. Ocutiars is also effectively used for the treatment of artificial CKS after excimer laser surgery. It was recommended to drip the drug systematically for 3 months. Before LASIK, it is also included in the treatment sheet for 1 month. After surgery, they help restore the sensitivity of the cornea faster and eliminate the symptoms of DES than the main therapy. However, in some cases, the manifestation of epitheliopathy is completely the use of HA-based tear replacement therapy is not sufficient to stop. If we talk about the severe stages of DES, then, as a rule, it is recommended to combine low-viscosity drugs with high-viscosity gel-based drugs. However, this approach has limitations in patients using SCL, as they form a film on the surface of the SCL, which can cause blurred vision and discomfort. Therefore, it is necessary to avoid wearing CL during the treatment of a severe form of DES. In such a situation, it is recommended to prescribe the corneoprotector Korneregel - 5% dexpanthenol gel. The drug also contains carbomer, so Korneregel is a regeneration stimulator and tear gel. is a combination drug that combines the properties of the substitute. Dexpanthenol is a derivative of pantothenic acid, which in turn is an integral component of coenzyme A. Pantothenic acid normalizes cell metabolism, under its influence, the strength of collagen fibers of the skin and mucous membrane increases, the formation and regeneration of cell elements increases. Currently, Korneregel is recommended as an indispensable tool in the complex treatment of corneal diseases due to the universal nature of the therapeutic effect. This is the treatment of eye burns, complex treatment of viral keratitis, postoperative correction and reduction of complications in the form of excessive death of endothelial cells, reduction of epithelization and restoration of corneal transparency, corneal transparency, permanent erosions, wounds and perforations of the cornea. used to reduce The mechanical effect of SCL on the surface of the eye, even with constant instillation of low-viscosity agents, does not always ensure sufficient wetting of the lens surface, which, in turn, can lead to the development of epitheliopathy. In such cases, it is necessary to use corneotrophic agents as a reparative regeneration stimulator. Korneregel is prescribed 2 times a day 15 minutes before putting on CL and at night after removing the lenses from the eye for 10-15 days, then you can switch to a single instillation at night. If necessary, it is used for a long time. According

to the study, against the background of using Korneregel, with long-term wearing of SCL, complete epithelization and restoration of the surface layer of the epithelium was achieved in patients with severe epitheliopathy after 7-14 days. z is prescribed after removing the lenses, then you can switch to one-time instillation at night. If necessary, it is used for a long time. According to the study, against the background of using Korneregel, with long-term wearing of SCL, complete epithelization and restoration of the surface layer of the epithelium was achieved in patients with severe epitheliopathy after 7-14 days. z is prescribed after removing the lenses, then you can switch to one-time instillation at night. If necessary, it is used for a long time. According to the study, against the background of using Korneregel, with long-term wearing of SCL, complete epithelization and restoration of the surface layer of the epithelium was achieved in patients with severe epitheliopathy after 7-14 days.

Summary

Thus, when wearing SCL for a long time, it is very important that the patient is under the supervision of an experienced ophthalmologist. As a preventive measure, in order to avoid the development of discomfort when wearing CL, it is recommended to use non-preservative tear substitutes based on HA. If the effect of low-preservative tear substitutes is not sufficient, 5% dexpanthenol gel - Korneregel is recommended for the treatment of superficial defects in the epithelial layer and to accelerate epithelization due to its ability to stimulate the process of epithelial cells.

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