MEIBOMIAN GLAND DYSFUNCTIONS AND THE OCULO-PALPEBRAL PATHOLOGY AT CONTACT LENSES WEARERS

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Keywords: Meibomius gland dysfunction, dry eye syndrome

Abstract: DGM Meibomius gland dysfunction is a common eyelid condition, 35% -50%, a percentage that increases with age. It is a major cause of evaporation dry eye cause loss of glands resulting in reduction of the tear film lipid layer, the aqueous layer causing increased evaporation of the tear film instability causing ocular surface disorders and the free edge of the eyelid. DGM plays a major role in the pathology of eyelid margin. It is very common, but often unnoticed, ignored and undiagnosed.

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CLINICAL SIGNS OF MGD
Aberrant meibum production and/or composition due to:
- Obstruction of the meibomian glands
- Gland dropout
- Change in gland secretion
- Patients complaining of repeated ‘styes’
- Characterized by tear film instability and rapid TFBUT

Figure no. 1. Obstruction of the meibomian glands

CLINICAL CHARACTERISTICS OF MGD: SYMPTOMS:
- Burning
- Itching
- Excessive tearing
- Granular sensation and scratchiness or foreign-body sensation due to crusted debris or dryness
- Decreased vision or changes in visual clarity due to poor tear film
- Eyelids stuck together upon waking
- Crusty debris around the eye lashes, especially upon waking
- Eyelids red, especially upon waking

Figure no. 2. Express the meibomian glands

A diagnostic process for identification of MGD patients

SCAN lid for plugged glands, injection, redness, foamy secretions
EXPRESS lower / middle glands and evaluate meibum quantity an quality.
TREAT dry eye symptoms with Lubricant Eye Drops+ lid hygiene

MEIBOMIAN GLAND DYSFUNCTIONS AND ASSOCIATED OCULO-PALPEBRAL PATHOLOGY

MGD symptoms are not specific and often are not correlated with the degree of Meibomian gland disease seen on examination - like foreign body sensation, burning, red eyes etc.
MGD is frequently associated with dry eye disease as Meibomian kerato-conjunctivitis, chalazion, meibomitis, evaporative dry eye, contact lens intolerance, ocular rosacea / acne rosacea.

**BLEPHARITIS**
Blepharitis often coexist with other related conditions, most frequently dry eye diseases, seborheic dermatitis, acne rosacea and atopy. Posterior blepharitis affects the Meibomian glands and the gland orifices (known as Meibomian gland dysfunction)

**CHALAZION**
It is generally characterized by a complication of posterior blepharitis, usually associated with Meibomitis or Acne Rosacea. Contact lens intolerance - to be discontinued.

**MEIBOMIAN KERATO-CONJUNCTIVITIS**
Meibomian Kerato-Conjunctivitis (MKC, primary meibomitis) is the most severe lid margin inflammation
It is associated in all cases with some forms of skin disease such as seborrhea sicca, acne rosacea or seborheic dermatitis, separately or in combination with atopy

**CONTACT LENS INTOLERANCE**
Contact lens wear is associated (50%) with a decrease in the number of functional Meibomian glands, also proportional to the duration of contact lens wear.
In MGD tear film is easily disturbed and the lipid layer comes in contact with the lens material and modifies the quality of the contact lens, leading to lipid deposits on the lens surface, disturbance of the visual acuity and intolerance of the contact lens material.

**ACNE ROSACEA**
Rosacea is associated with sebaceous gland hypertrophy of the face.

**OCULAR PEMPHIGOID**
Chronic bilateral conjunctivitis persisting for years, leading to increased scarring, symblepharon, increasingly shallow conjunctival fornix that may progress to total obliteration of the conjunctival sac between the bulbar conjunctiva and the palpebral conjunctiva.

**EVAPORATIVE DRY EYE**
• MGD is the most common cause of increased evaporation of the tear film
• MGD is associated with a reduction of the tear film thickness due to an excessive evaporation of the lachrymal film by deficiency of lipid secretion. This affects the corneal metabolism and increases the desquamation of epithelial cells, creating a potential site of bacterial invasion.

**Management Strategy for MGD**
• Supplement and stabilize the lipid deficient tear film
• Protect the ocular epithelium
• Provide symptomatic relief of dry eye

**Therapy Goals**
- Improve posterior lid margin environment
- Minimize risk of progressive MG orifice obstruction
- Enhance tear stability
- Artificial tears specially designed to restore the lipid layer
- Lid thermo massage
- Decrease lid margin and ocular surface inflammation
- Corticosteroids (oral and/or topical)
- Tetracycline (oral and/or topical)
- Azithromycin (oral and/or topical)
- Omega-3 essential fatty acids
- Cyclosporine

Artificial tears specially designed to restore the lipid layer are formulated to:
- Stabilize the tear film
- Supplement inadequate meibomian gland secretions with natural lipid
- Restore the deficient lipid layer
- Provide relief of dry eye symptoms related to MGD

Historically MGD is considered one of the most difficult disease to treat because we don’t have an effective etiological therapy.

- Beside classical treatment with local drops and ointments, local hygiene, warm compress, glands massage and thermotherapy – with some special devices.
The Meibomian lipids melt between 32 – 40\(^\circ\) Celsius, not at a fixed temperature. However, Meibomian secretion in subjects with MGD start melting at 35\(^\circ\) Celsius, versus 32\(^\circ\) Celsius in normal subjects.

Recent studies found out that temperature influences significantly the drainage of the Meibomian gland secretions. The drainage from the dysfunctional glands is significantly improved through thermotherapy. This is most likely explained by a change in the Meibomian oil viscosity.

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**Conclusions:**

MGD is a very frequent chronic condition in the general population, but yet often overlooked in ophthalmic practice with the result of an important number of patients who are not really cured and satisfied.

The patients with oculo-palpebral pathology should be always examined closely to evaluate connection with MGD, because complications of MGD are common and may involve severe ocular surface damage and contact lens intolerance.

New treatment methods proved to accelerate healing, increase the tolerance of the contact lens material and improve patients’ quality of life.

**REFERENCES**

HAS THE ULTRASOUND TIME USED DURING PHACOEMULSIFICATION AN EFFECT ON THE CORNEAL ENDOTHELIUM?

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Keywords: endothelial corneal cells, ultrasounds, facoemulsification

Abstract: This work is a study on 40 patients operated for cataract through facoemulsification technic. It was correlated the time of ultrasound used with the endothelial cells loss. The statistic study shows that the loss of endothelial cells related with ultrasound time used is not significant.

Cuvinte cheie: celule endoteliale corneene, ultrasunete, facoemulsificare

Rezumat: Lucrarea este un studiu pe 40 de pacienți operați pentru cataractă prin tehnică facoemulsificării, la care s-a corelat pierderea de celule endoteliale în funcție de cantitatea de ultrasunete folosită. Studiul statistic arată că timpul de ultrasunete folosit nu influențează semnificativ pierderea de celule endoteliale.

INTRODUCTION

The cataract is one of the most frequent ocular surgical disease. The cataract means the opacification of the lens. The removal of the opacified lens is made usually through the phacoemulsification technique. The removal of the lens presumes his replacement with an artificial lens. (1)

This procedure can have different effects on the endoocular structures and especially on the cornea (endothelial cells layer).

The corneal endothelium is a single layer of cells. Its role is essential in maintaining the integrity of the cornea. It’s cells can’t regenerate. Starting with the second decade of life the density of the cells decrease from 3000 – 4000 cells/mm² to 2500 – 2700 cells/mm² in the eight decade of life. The loss of cells with the age causes the expansion of the neighbor cells in order to fill the empty spaces.

Corneal transparency is controlled by the active endothelial ionic pumps, which maintain a low level of stromal hydration.

When the endothelial cell count drops below 600 to 800 cells/mm², corneal decompensation, and corneal edema occur as a result of the compromised pump function (3,4).

Figure no. 1. The structure of the cornea

The purpose is to show the effects of the cataract operation through the phacoemulsification technique on the corneal endothelium related with the total ultrasound time.

METHODS

Our study is based on 40 patients which where operated through this type of surgery in the clinic of ophthalmology of the Sibiu hospital. All cases where age related cataract with the index of nuclear sclerosis up to third degree.

Exclusion criteria where the ocular diseases, systemic diseases, corneal pachymetry greater than 0,60mm and the preoperative endothelial cells count less than 1800.

The pachymetry presumes the measuring of the cornea which is an indicator of the integrity of the corneal endothelium (normal thickness in the central area is between 0,49 – 0,56 mm).

All the surgeries where performed by the same surgeon and by the same technique.

The surgical procedure:
- topical anaesthesia, with tetracaine 0,5% administrated 10 minutes before surgery
- the clear corneal microincision (2,2 mm) using OVD (ophthalmic viscosurgical device) cohesive and dispersive
- phacoemulsification with the Infinity machine.
- implantation of foldable artificial lens

The number of the endothelial cells and the pachymetry of the cornea where performed through specular microscopy in the day before and after 7-14 days after surgery.

RESULTS AND DISCUSSIONS

We have found that the average number of the endothelial cells lost was of 304 cells/mm² and the ultrasound time had an average of 38,39 sec. The growth of the corneal thickness is correlated with the endothelial cells loss.

Figure no. 2. Corneal endothelial cells density
The correlation coefficient between the ultrasound time and the endothelial cells loss has a low value $R^2=0.1944$

Figure no. 3. Corneal thickness

The risk of endothelial cells loss correlated with the ultrasound time is low.

Figure no. 4. Total ultrasound related to the endothelial cell loss

Until recently it was believed that the human cornea had an average value of 550 microns, having 5 layers: epithelium, Bowman membrane, stroma, Descemet membrane and endothelium. Recently the clinical experience from the corneal transplantation has lead to the discovery of a new layer, the 6th. This discovery was made by Harminder Dua from the University of Nottingham.

The layer is between the stroma and the Descememt membrane. This layer has been highlighted by injecting air between the layers of the cornea and has been confirmed by electronic microscopy.(4,5)

Even if it is very thin (only 15 microns), Dua’s layer is very resistant and is able to resist to pressure up to 1.5–2 bars. In the present it is believed that different corneal edema is caused by discontinuities in Dua’s layer caused by different factors.

CONCLUSIONS

The injury of the cornea during phacoemulsification is multifactorial.

The loss of endothelial cells related with ultrasound time is not significant.

The phacoemulsification technique through microincision and the usage of OVD is very safe for the cornea.

Figure no. 5. Pachimetry before and after phacoemulsification

The phacoemulsification technique through microincision and the usage of OVD is very safe for the cornea.

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EarlY Detection of Keratoconus in fellow eyes of keratoconus Patients using the ocular response analyzer – case report

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Abstract: Keratoconus patients show alterations in corneal biomechanics. Low corneal resistance factor (CRF) and corneal hysteresis (CH) are useful parameters for detecting early stage keratoconus. Some factors affect the stability of the cornea, cannot be detected by corneal topography, but are responsible for progression from suspicion to manifest keratoconus. We present the case of a 20-year-old woman diagnosed with stage II keratoconus in the right eye. The fellow eye showed no topographic and keratometric changes consistent with keratoconus. Examination performed with the Ocular Response Analyzer (ORA) indicated decreased values of CRF and CH bilaterally. Six months later, ORA shows increased index of suspicion and modified CH and CRF values in the left eye. Corneal topography confirms the diagnosis of early stage keratoconus. In this case, ORA represents a useful instrument for the early detection of keratoconus, before any topographic changes occur, in patients with a previous diagnostic in the fellow eye.

INTRODUCTION

Keratoconus is a non-inflammatory corneal ectasia, usually bilateral, with an incidence of 1:2000 in the general population. It is characterized by progressive thinning and protrusion of the central and paracentral cornea, resulting in a cone-like shape. The hallmark of this disorder is the presence of irregular astigmatism, as a consequence of changes occurring in the anterior corneal geometry. These changes can be assessed and measured by means of corneal topography which reveals the following: increased area of corneal power surrounding by concentric areas of decreasing power, inferior–superior power asymmetry, and skewing of the steepest radial axes above and below the horizontal meridian. All these topographic alterations in keratoconic eyes appear as a consequence of the biomechanical changes that occur in the corneal structure. Corneal elasticity and rigidity are severely affected in keratoconus, due to the structural alterations of the cornea. The in vivo study of corneal biomechanics has challenged scientists over the last couple of years. To date, only one clinical device has been developed for the purpose (Ocular Response Analyzer [ORA]; Reichert, DePew, NY). Two biomechanical parameters, essential in the study of keratoconus, are provided by this instrument: corneal hysteresis (CH) and corneal resistance factor (CRF). Corneal hysteresis describes the biomechanical response of a visco-elastic structure to an applied load, measuring the ability of the material to dissipate energy. Therefore CH measures the energy absorbed by the cornea during aplanation. CRF is a global indicator of the relative resistance of the cornea, independent of intraocular pressure or relations between the degree of hydration and the elastic resistance of the cornea.

Studies consistently report that CH and CRF are significantly lower in keratoconus than in normal eyes and also correlate with other clinical data and measurements such as: refraction, keratometry, corneal topography and pachymetry. Saad et al. have compared biomechanical properties of the cornea in a selected group of keratoconus suspect patients with a group of normal patients. They proved a decrease in CH and CRF values in keratoconus suspect eyes and that the difference between those parameters is more positive as the disease severity worsens. This fact indicates that natural

Keywords: early detection, keratoconus, Ocular Response Analyzer

Cuvinte cheie: diagnostic precoce, keratoconus, Ocular Response Analyzer

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Progression of keratoconus involves continuous alterations of corneal biomechanics, supporting the existence of unknown factors that affect the stability of the cornea and cannot be detected by corneal topography. These factors are responsible for the obvious progression from suspicion to manifest keratoconus and even to advanced stage disease (9).

Galetti et al. recently reported improved sensitivity and specificity of CRF in detecting early stage keratoconus, even in topographically normal fellow eyes of keratoconus patients. The multifunction analysis using ORA increases the sensitivity in detecting early stage keratoconus in comparison to corneal topography, with increased specificity against using CH and CRF separately (10,11).

Wolffsohn et al. reported increased sensitivity and only a mild decrease in specificity (3%) of keratoconus detection and stage prediction by incorporating wave front parameters in addition to baseline assessment including corneal topography, pachimetry and keratometry (9,10).

**CASE REPORT**

A 20-year-old woman P.C. was referred to us in March 2013 complaining of decreased vision in both eyes, progressing over the last 6 months. She was diagnosed with compound myopic astigmatism during childhood and her family history was insignificant.

We determined her best uncorrected visual acuity (BUVA) 0.05 in the right eye (OD) and 0.16 in the left eye (OS). Best spectacle corrected visual acuity (BSCVA) was 0.7 OD with -1.50 – 1.50 x 20° and 0.9 OS with -1.00 – 0.75 x 135°. The slit-lamp examination was normal in both eyes. Corneal pachimetry measurements were 473 µm OD and 484 µm OS (normal values range between 520-540 µm). Corneal biomechanical parameters determined using ORA showed decreased CH and CRF, increased index of suspicion and modified Keratoconus match index values in both eyes (Table 1).

Table no. 1. Corneal biomechanical parameters determined using ORA for the two examinations.

<table>
<thead>
<tr>
<th>March 2013</th>
<th>September 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>OD</td>
<td>OS</td>
</tr>
<tr>
<td>CH (millidynes)</td>
<td>9.5</td>
</tr>
<tr>
<td>CRF (millidynes)</td>
<td>0.0</td>
</tr>
<tr>
<td>Keratoconus match index</td>
<td>0.7/6</td>
</tr>
<tr>
<td>Keratoconus probability (%)</td>
<td>Normal</td>
</tr>
<tr>
<td>Suspect</td>
<td>41</td>
</tr>
<tr>
<td>Mild</td>
<td>21</td>
</tr>
<tr>
<td>Moderate</td>
<td>1</td>
</tr>
</tbody>
</table>

Keratometry and topography measurements are listed in Table 2. Corneal topography showed asymmetric bow-tie pattern OD, consistent with keratoconus (figure no. 1). Final diagnostic was stage I-II keratoconus OD and keratoconus suspicion OS with a recommended 6 month follow-up for possible progression in the left eye.

Table no. 2. Keratometry and topography measurements for the two examinations

<table>
<thead>
<tr>
<th>Keratometry</th>
<th>March 2013</th>
<th>September 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>OD</td>
<td>44.75 ± 0.01</td>
<td>45.00 ± 0.01</td>
</tr>
<tr>
<td>OS</td>
<td>45.00 ± 0.10</td>
<td>45.70 ± 0.10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CORNEAL TOPOGRAPHY</th>
</tr>
</thead>
<tbody>
<tr>
<td>OD</td>
</tr>
<tr>
<td>44.05 ± 0.01° (54.99 ± 0.01°)</td>
</tr>
</tbody>
</table>

In September 2013 the patient has the same BUVA, but her BSCVA is slightly decreased in the left eye: 0.7 OD with -1.50 – 1.50 x 20° and 0.8 OS with -1.00 – 0.75 x 135°. The slit-lamp examination reveals a Fleischer ring OD, the left eye maintaining a normal aspect.

The corneal pachimetry is stationary: 469 µm OD and 483 µm OS. ORA measurements show decreased CRF value and increased index of suspicion in the left eye with no significant changes OD (table no. 1).

Keratometry and topography results show a 0.50 diopter increase in the steepest radial axis (K_max) OS (table no. 2), corneal topography confirming the diagnostic of early-stage keratoconus OS (figure no. 3).

Figure no. 1. Corneal topography from March 2013 is consistent with stage I-II keratoconus RE

Figure no. 2. Corneal topography from March 2013 LE

Figure no. 3. Corneal topography from September 2013 OD
Figure no. 3. Corneal topography from September 2013 confirms the diagnosis of early-stage keratoconus LE

**DISCUSSIONS**

In the above-presented case, the ORA measurements, determined every 6 months, which suggest certain progression from suspicion to early-stage keratoconus OS are the following: decreased CRF value, modified Keratoconus match index and increased index of suspicion.

Although the first examination did not reveal any topographic changes consistent with keratoconus and the slit-lamp examination was normal in both eyes, corneal topography performed six months later confirmed the progression in the left eye by an increase in $K_{max}$. Likewise, pachimetry remained stationary and BSCVA was satisfactory for the two exams, which may represent a challenge in establishing a proper diagnostic of keratoconus in the left eye.

Nevertheless, the modified corneal biomechanics are certified by decreased CH and CRF values, before any topographic and keratometric alterations occur. Therefore measurements of corneal biomechanical parameters using ORA should be included in standard investigation routines of keratoconus patients, especially for those with unilateral previously diagnosed keratoconus, in order to establish future progression in the fellow eye.

**CONCLUSIONS**

In conclusion, corneal biomechanical parameters determined using ORA should be of future use in screening protocols, in order to enhance the sensitivity and specificity of corneal topography. They proved to play an important role in the early detection of biomechanical changes in cases of suspicion or for diagnosing early-stage keratoconus.

Thus, ORA becomes a useful instrument in the early detection of keratoconus, before any topographic changes occur, in order to increase the success rate of minimally invasive treatments and to eliminate aggressive or expensive therapies such as penetrating keratoplasty.

**REFERENCES**

Cataract is the leading cause of vision loss in the elderly. Although as an alternative medical treatment is desired by the patient but with questionable efficacy, only and more efficient treatment is surgery by phacoemulsification and implantation of artificial lens. Postoperative patient dissatisfaction may be caused by insufficient attention to the quality of the ocular surface.

This paper presents the influence of drugs used pre, intra and postoperative on ocular surface and the cataract surgery itself.

Ocular surface represented by the conjunctiva, limbus sclerocornean, cornea and tear film make refractive surface and acts as protection against mechanical, toxic and infectious factors. Deficiency tear, mechanical irritation or infection affect epithelial surface causing damage of immune tolerance, release of inflammatory cytokines (TNF, IL) and matrix metalproteinaze, destroying tissue, remodeling of degenerating tissue and loss of function.(1)

The relationship between cataract surgery and ocular surface is bilateral: ocular surface pathology influence cataract surgery and this in turn affects the ocular surface homeostasis. Ocular surface dysfunction influences preoperative determination for keratometric values and is possible biometric errors; intraoperative visualization may be difficult and postoperative patient discomfort worsens and may be associated with delayed recovery of visual acuity.

Preoperative medications including drugs that dilate the pupil, antibiotics, anti-inflammatory and anesthetics affect the ocular surface homeostasis. Sympathomimetic mydriatic agents and cycloplegics parasympatholytics cause corneal irritation of nerve endings. Non-steroidal anti-inflammatory drugs (NSAIDs) prevent pupillary miosis, reduces surgical inflammation, prevent postoperative cystoid macular edema, decrease prostaglandin synthesis by inhibiting cyclooxygenase.(2)

Studies show that topical administration one hour before surgery has high efficacy and the risk of endophthalmitis is reduced with the use of cefoxirine in the anterior chamber, but the most efficient prophylaxis of endophthalmitis is represented by the use of topical 5% povidone iodine prior to surgery instilled with equal efficacy to topical antibiotics.(3)

Anesthetics used currently block the initiation and propagation of neuronal action potentials, the myelinated nerves with small diameter is the most susceptible to their action. Determine alteration of tear secretion and stability, epithelial toxicity is due to benzoicen, idiosyncratic allergic reactions. Due to the high safety Benoxinate 0.4% is the most used, lidocaine gel increase corneal hydration, Tetracaine 0.5% and Proparacaine 0.5% are commonly use due to short action and reduced epithelial toxic effects.(4)

Use of intraoperative medication (antibiotics, epinephrine, lidocaine) by adding in irrigation solutions is not recommended because determines altering pH, the chemical balance and osmolarity and also shows toxic potential.(2)

Postoperative topical antibiotics are used in combination with steroids and NSAIDs. NSAIDs reduce postoperative inflammation and provide pain relief but if are used for more 4 weeks increases the risk of corneal melting more so as there are conditions for neurotrophic keratitis, dry eye, blepharitis or meibomite. Corticosteroids inhibit phospholipase A2, lipoxigenase and cyclooxygenase way, alter the production of proteinase inhibitors, inhibit the production of inflammatory mediators, reduce vascular permeability, edema, cellular infiltration, capillary dilatation and proliferation of fibroblasts. But long-term use may increase intraocular pressure, mydriasis, ptosis, inhibition of corneal epithelial and stromal healing and staining (5).

Preservatives, substances that act as stabilizing drugs and promoting passing through the cornea have negative effect on the ocular surface. According to studies by Epstein et al. thiomersal and benzalkonium chloride (BAC) have a higher toxicity than alcohols and poliquad. BAC determines dissolving of cell membranes of microorganisms due to hydrophobic and hydrophilic chains that act as biocides.

The cytotoxic effect is manifested indirectly by disrupting the aqueous and lipid phase, decreasing of glicocalix
and mucin quantity, decreased epithelial proliferation and cell adhesion emphasize cell permeability. Thiomersal is an organic mercury compound that is metabolized in the body into ethyl mercury and antimicrobial effect by increasing cell permeability and reduced enzyme activity. Make conjunctival and corneal cytotoxic reactions, eyelid edema, chemosis.(6)

Surgery brings elements that can damage the ocular surface either by burn tissue in the absence of adequate cooling, or by thermal effect produced by microscope. Corneal edema is produced by endothelial damage (especially in those with low numbers of endothelial cells) by using ultrasounds with high energy and for long time.

Surgical trauma, inflammation, exposure to preservatives and topical anesthetic medication, sensory nerve damage by corneal incisions at 3 and 9 o’clock are possible causes of developing dry eye syndrome. Dry eye syndrome are caused by disruption of corneal sensitivity (corneal sensitivity returned to preoperative levels at 3 months after surgery, increased permeability of the corneal epithelium, reduced tear film stability.(7)

Careful preoperative ocular surface evaluation is vital to avoid postoperative complications and dissatisfaction after cataract surgery. Pre and postoperative therapy, as well as surgery affect normal metabolic activities at the ocular surface. It is necessary to educate patients on pre-existing tear film dysfunction preoperatively and possible exacerbation of symptoms postoperatively.

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EVOLUTION OF CHILDREN WITH KERATOCONUS AFTER CROSSLINKING – RETROSPECTIVE STUDY

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Keywords: children, keratoconus, crosslinking

Abstract: This paper is a retrospective study after crosslinking was performed and includes 34 of keratoconus cases with range age between 13 to 18 years old. Intervention was performed using “epi-off” method. Visual acuity, refraction and corneal values were followed parameters. All cases were analyze at 1 year after crosslinking was performed, 28 cases at 2 years and only 15 cases were evaluated at 3 years. Approximately 50% of cases evaluated at 1 and 2 year after crosslinking present regression of keratoconus evolution and only 20% of cases manifest progression of disease. At 3 years after crosslinking 60% of cases present regression of evolution and 33.33% manifest progression of keratoconus. Crosslinking intervention represents a therapeutic modality that has to be performed at children with keratoconus. The efficacy of this method was obtained for approximate half of cases.

RESULTS

The study included 34 cases that were evaluated at one year, 28 cases of which were assessed at two years and 15 cases were analyzed at three years. Age of cases examined was range between 13 and 18 years with a mean of 16.08 years. Male were predominated at the entire group (26 cases).

Slit lamp examination shows no corneal changes in a quarter of cases, but shows the present of Fleischer ring isolated (12 cases) or associated with Voght striae (7 cases).

The average of spherical refraction decreases from 52.58 to 51.97, while the mean value of K max increases from 4.36 D to 4.79 D. The mean value of K max increased from 52.92D to 52.58D.

Cases assessed at three years stands out in a marked trend of increased spherical refraction from an average -3.348D to -6.88D, probably due accentuation of myopia with ages. Average of cylindrical refraction decreased from -5.31D to -4.2 D. The average of K max shows a slight accent from a value of 53 D to 53.84 D.

Figure 1 highlights the evolution of cases at one, two and three years after crosslinking. As shown approximately 50%
of cases evaluated at 1 year and 2 years manifest the regression of the disease. Approximately 30% of cases have a relatively constant evolution in the first 2 years after CXL but in 20% of cases the disease has progressed. At 3 years after surgery although the percentage of cases in which the disease has regressed is higher (60%) shows an increase in the number of cases that evolved after crosslinking (33.33%).

Figure no. 1. Evolution of cases at 1, 2, and 3 years after CXL

Visual acuity without correction shows a relative improvement. At 1 year from an average of 0.3 to 0.36 Snellen lines and at 2 years from 0.29 to 0.3. Cases examined at three years shows an average constant for visual acuity without correction (0.24) pre and post – CXL. Most cases have remained constant or improved visual acuity without correction regardless of the period of observation (table 1).

Table no. 1. VA without correction evolution at 1, 2, and 3 years after CXL

<table>
<thead>
<tr>
<th>VA without correction</th>
<th>1 year</th>
<th>2 years</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased</td>
<td>6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Constant</td>
<td>8</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Improvement</td>
<td>20</td>
<td>17</td>
<td>8</td>
</tr>
</tbody>
</table>

VA with correction was in the range 0.5 -1. In most cases (25) were prescribed rigid contact lenses but 7 of them have not used. In 8 cases VA was corrected with glasses and varying in range 0.5 – 0.9, one case has been corrected with toric soft contact lens and for one case VA after CXL was 10/10 without correction.

DISCUSSIONS

Increasing of average values for spherical refraction at two, respectively three years is probably due increasing with ages of antero-posterior axis of the eye. This theory is sustained by decreasing of cylindrical refraction for cases evaluated at three years after CXL.

Increasing of mean value for K max at three years after CXL is probably obtained by small number of cases evaluated.

CONCLUSIONS

Patients with keratoconus show a favorable outcome after crosslinking (regression or constant parameters) the more their age approaching 18 years. CXL performing, minimally invasive procedure that increases corneal resistance should be considered for these patients, although no specific criteria to prevent disease progression. Monitoring cases younger than 18 years presenting keratoconus must be done carefully and more frequently (every 3 months).

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AMT, v. II, no. 1, 2014, p. 58
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Keywords: keratoconus, cross-linking, corneal topography

Abstract: We will present a case of a 32 year old male, living in urban area, software engineer, with no relevant current disease, but current symptoms which started subjectively last year, complaining of decreased distant visual acuity for which the patient was recommended optical correction. We performed at the LE CXL ultraviolet(UV) –Epi-off technique. The visual prognosis depends on the evolution of Keratoconus. The modern therapeutical treatments in keratoconus induce a very good functional prognosis and quality of live.

CASE REPORT

We will present a case of a 32 year old male, living in urban area, software engineer, with no relevant current disease, but current symptoms which started subjectively last year, complaining of decreased distant visual acuity for which the patient was recommended optical correction.

At the ocular examination we noticed:

- visual acuity (VA) at right eye (RE)=0,1 cc (-3,00/-5,00x700 and at left eye (LE) =1 cc (-1,25x 950),
- refraction: RE: -3,25/-6,00x710, LE: -1,00/-1,50x970
- keratometry: RE: 50,75; 46,25 D, LE: 44,00; 42,5D.
- biomicroscopy showed RE: slight conic deformation of the cornea, LE: normal
- the intraocular pressure (IOP) at both eyes (BE) was: 16 mmHg.
- fundoscopy showed BE (both eyes): normal.

The corneal topography is presented in figure no 1 and 2.

Figure no. 1. Corneal topography RE

After the clinical and the paraclinical exam we put the following diagnosis: BE: Keratoconus stage II/III RE, I/II LE.

The therapeutical possibilities are: RE: Crosslinking (CXL) + intracorneal ring segments/ Topo-guided and LE: crosslinking techniques (CXL).

We performed at the LE CXL ultraviolet(UV) –Epi-off technique with the following steps:

- standard protocol
- Anesthesia topic (Benoxi) – 3-4 drops, 15-20 min before CXL
- 9 mm diameter corneal de epithelialization
- Instillation of anesthetic drops
- Instillation of riboflavin 0,1% every 3 min for 30min before irradiation
- Exposure of the central corneal 9 mm to UV+
- Instillation of riboflavin 0,1% every 3 min for 30min, energy 2,94 J
- Instillation of ofloxacin + indocolyr drops
- Therapeutic contact lens for 3-4 days

Figure no. 2. Corneal topography LE

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AMT, v. II, no. 1, 2014, p. 59
Postoperative we used at LE: Tobradex 5x/ day 4 weeks and artificial tears 2x/zi 4 weeks.

The follow up at 6 weeks showed:
- Corneal haze 2-3 month, best corrected visual acuity (BCVA)
- RE= 0.1,
- BCVA LE= 1, biomicroscopy;
- LE: corneal haze.

We decided to continue the treatment with artificial tears.

Follow up 3 month
- BCVA RE=0.1, BCVA LE=1;
- Biomicroscopy: OS: a small central pulvelurent zone
- Refraction: RE: -2.50/-6,25x700 LE: -0,25/-1,25x980
- Keratometry RE: 45.25; 50.75 D, LE: 42.00; 43.50 D.

The patient continued treatment with artificial tears.

The corneal topography is shown in fig. 3 and 4.

Figure no. 3. Corneal Topography RE

Follow up at 1 year showed:
- BCVA RE=0.2 cc (-7.00);
- BCVA LE=1 cc (-1.00/-1.00x950);
- BE: clear cornea;
- Refraction:
  - RE: -2.50/-6,25x700
  - LE: -0.25/-1,25x980,
- Keratometry RE: 45.25 ; 50.75 D
- Kertometry LE: 42.00; 41.50 D.

We can see the corneal topography in fig 5 and 6.

Figure no. 5. Corneal Topography RE

AMT, v. II, no. 1, 2014, p. 60
We applied the following treatment: OD Topo-guided + cross-linking Epi-off energy 2.98 J. The treatment report is shown in fig. 7

Figure no. 7. Treatment report- Topo-Guided

We recommended at RE topical treatment with Tobradex and artificial tears for 6 weeks.

The follow up at 6 weeks showed:
- BCVA RE=0.3;
- BCVA LE=1;
- Refraction:
  - RE: -5.50/-2.50x70;
  - LE: 0.00/-1.50x85;
- RE: corneal haze.

The patient continued the treatment with Edenorm and Flumetol.

The follow up 3 month registred:
- BCVA RE=0.3;
- BCVA LE=1;
- Refraction:
  - RE: -5.50/-2.50x70;
  - LE: 0.00/-1.50x85;
- RE: clear cornea

The follow up at 6 months showed:
- BCVA RE=0.3 cc (-5.00/-2.50x900);
- BCVA LE=1 cc (-1.50x900);
- Refraction:
  - RE: -5.75/-2.50x800;
  - LE: 0.00/-1.50x850;
- Keratometry:
  - RE: 50.00; 47.50 D;
  - LE: 43.60; 41.0 D

The corneal topography is shown in fig 8.

We recommended a trial period with contact lenses (CL) Kerasoft 3 RE: -6/-8.4/-14.5 mm, Air Optix toric LE 0.00/-1.25x900.

The patient had BCVA RE=0.9-1 with CL, BCVA LE=1 with CL.

BE: good motility, Over refraction: RE: +2.25/-3.00x750 LE: 0.00/-0.25x1000 and good accommodation and comfort.

The visual prognosis depends on the evolution of Keratoconus.

THE PARTICULARITY OF THE CASE

Late subjective installment of the disease (at 31 years) Stationary evolution after applied therapeutic methods. The modern therapeutical treatments in keratoconus induce a very good functional prognosis and quality of life.
IATROGENIC FACTORS THAT INFLUENCE OCULAR SURFACE

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Keywords: ocular surface, tear film, dry eye syndrome

Abstract: Ocular surface (OS) is formed by the cornea, conjunctiva and limbus covered by a nonkeratinized squamous epithelium which constitutes a support for the tear film preventing evaporation of the latter and also preventing penetration of pathogenic agents. Primary function of the ocular surface constitutes in assuring a clear vision, contributes in 2/3 of the ocular refractive system, maintain ocular comfort and prevent microbial contamination. Integrity of OS is determined by the integrity of the corneal epithelium and also by the precorneal tear film. Any disfunction in either of those 2 factors determines dry eye and epithelial instability.

Ocular surface (OS) is formed by the cornea, conjunctiva and limbus covered by a nonkeratinized squamous epithelium which constitutes a support for the tear film preventing evaporation of the latter and also preventing penetration of pathogenic agents.

Primary function of the ocular surface constitutes in assuring a clear vision, contributes in 2/3 of the ocular refractive system, maintain ocular comfort and prevent microbial contamination.

Integrity of OS is determined by the integrity of the corneal epithelium and also by the precorneal tear film. Any disfunction in either of those 2 factors determines dry eye and epithelial instability. (7)

The tight relationship between the corneal epithelium and tear film is generated by the epithelial-mucine cell interface. A stable tear film protects the ocular surface and the epithelium participates actively in formation of the tear film. The explanation resides in the fact that goblet cells at the level of the conjunctiva secrets mucin (important component in tear film). Corneo-conjunctival nongoblet cells releases under epithelial surface different types of mucin transmembrane assuring humidity. Corneo-conjunctivale epithelium is nonkeratinized, but formation of keratin is strongly related to secretion of mucin and together they assure the humidification of the epithelium. Maintaining a healthy OS relies in the defence mechanism of the latter which assures tear film stability like in cellur differentiation. (7)

Ocular surface disease (OSD) consists in dry eye, neurotrophic keratitis, corneal Dellen, epithelial erosion, corneal ulcer, perforated ocular globe. Tests for evaluation of OSD are:

- History of the patient: symptoms (eye sensation), signs concerning the facies (acnee, other allergies) and free margin of lids.
- Biomicroscopy with examination of the free margin of eye lids, meibomian glands, conjunctiva, cornea
- BUT (break up time )
- Schirmer Test
- Coloration LF with fluorescein, lisamin, pink Bengal
- Corneal sensibility
- Impression cytology with BAC usage: loss of globlet cells and increased inflammation of ocular surface
- Tear stability analysis system (TSAS)
- Corneal topography (7)

A. Lids Surgery, like blepharoplasty, is used in epiphora, corneal erosion, inadequate occlusion, dry eye.

The risk factors in lid surgery are preexisten dry eye, absence of Bell’s phenomenon, Lasik in past history.

B. Perforating or lamellar Keratoplasty is used in persistent epithelial defect corneal ulcer, filamentary keratopathy, keratoconjunctivitis sicca.

Risk factors for epithelial complications are linked to donor (preservation of the cornea, diabetes mellitus at the donor) and linked to the host (innervation, advanced age, antibiotic use, preexisten dry eye).

C. LASIK (keratomileusis in situ )

Dry eye in Lasik or PRK (photorefractive keratotomy) is the main problem of refractive surgery. Frequently all patients present a transitory dry eye after LASIK

This complication is frequent, as: 60% of patients with Lasik had dry eyes for 1 month postoperatively (1); 50% of patients with Lasik had dry eyes for 6 month (2); 15% of patients

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with Lasik had dry eyes for 3 month; 5% of patients with Lasik had dry eyes for 6 month. (3,4)

Causes of dry eye post LASIK
1. The first cause is increased pressure, suction ring during flap creation which deteriorates conjunctival goblet cells and compromises mucin layer of lacrimal film (LF). (5)
2. Alteration of the corneal surface associated with Lasik with corneal humidification by decreases blinking frequency. (5)
3. Medication with epitheliototoxic effect, such as antibiotic, antiinflammatory, preservatives (BAC).
4. Corneal denervation associated with decreased corneal sensitivity is the most frequent cause of dry eye. During the intervention the nerve endings are sectioned by the microkeratome and nerves from the anterior stroma are interrupted by the ablation, with deterioration of corneal innervation. Reduced corneal neuronal feedback to the brain induces decreased innervations to lacrimal glands and decreased production of tears.

The nerve regeneration postoperatively shows regain of corneal sensitivity in approximately 6 month, which can explain the transitory dry eye. (4)

Sensorial denervation-self perpetual cycle
The ocular surface and the lacrimal gland function forms a unit. The communication between them is formed by a circle of neuronal reflex. Sensorial nerves that innervated OS connects with efferent nerves from the brain with LF secretion and protein from the lacrimal glands. (6)

Corneal sensitivity decreased by decreased production of LF and CFL with dry eye which decreases sensorial reflex and decreases the ability of lacrimal glands to respond to OS insults.

Corneal anesthesia (flap and ablation) increases dry eye by reduction of afferent nerve routes between cornea and brain with decreased efferent signals from the brain to the lacrimal gland.

5. Corneal Flap

Normally, cornea is the most innervated and sensitive tissue of the body. Corneal sensitivity is vital for corneal epithelial integrity and LF function. It comes from long ciliary nerves, which ramificates from the suprachoroidal space many times until it penetrates in the cornea and limbus. Large nerves penetrates from the limbus predominantly at 9 and 3 o’clock and then bifurcates and runs towards 12 and 6 o’clock, after a secondary ramification in runs towards 9 and 3 o’clock.

Initially, nerves penetrates the cornea in 1/3 of the stroma, but orientates anteriorly where it ramificates and forms a complex under Bowman’s membrane which innervates the central cornea, then penetrates the Bowman’s membrane and ends in the wing cells layer (epithelial, suprabazal). (8)

The fact that the long ciliary nerve penetrates the cornea at 9 and 3 o’clock explains why corneal sensitivity is more expressed at the temporal and nasal limbus than inferiorly. In vivo confocal microscopy showed that Lasik induces alterations at the level of nerve plexus under Bowman’s membrane and decreases corneal sensitivity.

Corneal sensitivity is preserved in areas neighbouring the hinge and decreases towards central and peripheral cornea. (8)

Because corneal nerves penetrates predominantly at 9 and 3 o’clock, a superior hinge will go through both major areas of innervations, whereas a nasal hinge will go through a single area.

Domenfeld’s study(4) showed that loss of corneal sensibility and dry eye were less frequent in eyes with a large nasal hinge than in eyes who had a small hinge.

Punctuate epithelial erosion and Rose Bengal coloration was observed for several days to weeks after operation, including patients who did not have a preoperative dry eye. It is regularly observed for 6 month postoperatively. More accentuated to patients with preoperative dry eye. (9)

6. Inflammation

Is a proven cause of dry eye postoperatively: chronic inflammation with decrease production of tears and lacrimal tear clearance. Inflammatory response activates T lymphocytes at the level of OS and increase molecular adhesions and inflammation, increases inflammatory endotoxins in LF, increases enzyme matrix degradation in the LF. (9)

D. Alternative to Lasik

PRK (photorefractive keratotomy) consists in corneal deepithelialization and photoablation which leads to decreased corneal sensitivity and eradication of subepithelial nervous plexus and decreased circulation and stability of LF.

In Lasek (subepithelial keratomileusis), ciliary nerves are not sectioned, are destroyed only by ablation and only superficially[8].

Kanellopoulos and colab[2] shows a lower decrease in corneal sensitivity with PRK or LASEK than with LASIK has been observed. (6,7)

Dry eye prophylaxis after refractive surgery
A) Preoperative

Is made by a patient screening for dry eye. Suggestive situation of dry eye are: contact lens (CL) intolerance, chronic use of contact lens(hard), burning sensation, foreign body, dryness, meimomitis signs, stenosis or closed meibomian orifices, decreased production of tears. Quantitative and qualitative examinations of LF are: BUT, test Schirmer, conjunctival staining with Rose Bengal and fluorescein, corneal staining[8,9].

B) Intraoperative

The objectives are to conserve corneal epithelium and to prevent corneal erosions by minimal use of anesthetics use of lubricating ointments containing glicerin before using the microketome; after lifting the flap use a small quantity of carboxymetilcelullose 1 % on the corneal surface to reduce desiccation; steroids use, antiinflamatory and antibiotics (fluorochuinolone) before removal of the speculum; immediately after the surgery the patient is asked to close his eyes for 15 minutes before examination of the flap. (4)

C) Postoperative

The objectives in this case are: to facilitate epithelialization, to decrease the incidence of dry eye, reduced inflammation, by instillation of artificial tears every 2 hours (sometimes without preservatives), instillation of steroids. (4)

E. Glaucoma surgery

The dry eye after glaucoma surgery is more frequent in females and pseudoxefoliatie syndrome. It increases with treatment, time and number of medication.

Its causes can be: chronic antiglaucomatous therapy which decreases the number of goblet cells and cause epithelial cellular apoptosis; dry eye chronic inflammation (inflammation of ocular surface after trabeculectomy); bleb fibrosis (mitomicin use); permanent epithelial defect.

F. Crosslinking (CXL) therapy- epi-off technique

Causes of OSD (ocular surface disease) involving crosslinking technique are: deezpehithelialization, fibroblast necrosis, UV action.

Complication of CXL are: overexposure of UV, toxic action of UV, corneal opacification, infection (aseptic infiltrate), endothelial toxicity due to increased concentration of oxygen free radicals (increased concentration of riboflavine, high power

of UV, thin cornea), persistent epithelial defect (CXL+PRK topography) mostly after using mitomicin.

G. Posterior vitrectomy

Causes of OSD involving posterior vitrectomy are:
- diabetes mellitus
- ocular trauma
- afachia
- postoperative glaucoma

The risk factors are: existence of OSD preoperative, prolonged operation time, increased postoperative inflammation.

Treatment of dry eye consists in:
- Instillation of artificial tears
- Instillation of antibiotics and steroids
- Plugging of lacrimal system for stabilization of OSD (in severe cases)
- If meibomius gland affection is present doxicicline is used

Persistence of dry eye phenomenon Restazis (ciclosporine) for 6 month is prescribed.

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OCULAR SURFACE -A COMPLEX ADOPTIVE ENVIRONMENT OF TOPICAL GLAUCOMA TREATMENT

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Abstract: Ocular surface is a complex functional unit in which tissues so different as structure and function harmonize each other to produce a very short film - tear film (15-45 sec.) essential for quality of the vision. With age ocular surface undergoes a physiological decline, often with a limitation of its functionality. Administration of topical glaucoma treatment itself constitutes a solicitation of the ocular surface and the nature of "accessories" included in this "drop glaucoma treatment" might be last straw that breaks the fragile balance or aggravates a previously nonexistent suffering subclinical symptomatology opening and inducing reactions to treatment. Topical treatment in glaucoma could have the complex aspect of an adoption. Every adoption is a delicate and unpredictable phenomenon. Success does mean harmony and coexistence. For adoption to succeed we need to know the well adaptive environment, the adopted element and harmonize them together.

Keywords: ocular surface, topical glaucoma treatment, tear film

Cuvinte cheie: suprafață oculară, tratament topic în glaucom, film lacrimal

Topical treatment in glaucoma has a chronic character, often gradually increasing number of administered substances. Prolonged administration of such treatment takes the appearance of a true act of adoptions; ocular surface is adoptive environment, topical glaucoma treatment is adopted element and harmonize the two factors provide treatment tolerance and success thereof. For a relation to succeed adoption must know the foster, adopted and find the way to harmonize them. Adoptive environment

Ocular surface is a complex and dynamic adoptive environment equally vulnerable.

It’s almost a miracle that so different ocular tissues anatomically and functionally (conjunctiva and cornea) are delimited anatomically so neat, but are complex harmonizing through a fluid (tear film) into a functional unit called the ocular surface. Tear film is a film live very short film (15-40 seconds) which open the the way to visual perception. The structure of the tear film

External lipid layer has a thickness of 0.1 microns. It is produced by glands Meibomius, Zeiss and Moll. It contains low polar lipids (cholesterol esters) highly polar lipids (TG, fatty acids, phospholipids) and has the role to prevent evaporation of the tear film and tears overflow.

Aqueous layer is produced by the main lacrimal gland and accessory glands Krause and Wolfring. It is the main component of the tear film, having a thickness over the cornea of 7-8 micron.

He provides oxygen to corneal epithelium, removes debris and contains antibacterial substances, lysozyme, betalazine etc.

The inner layer of mucus is produced by conjunctival goblet cells and squamous epithelial cells of the conjunctiva and cornea and has a thickness of 0.2 microns.

It has vital role in the stability of the tear film hydrophobia, converting the hydrophilic corneal epithelium. It lubricate the ocular surface and eyelid and forms a sheath around foreign bodies protecting from their abrasive effect over cornea.

Foster environmental dynamics

Blinking dispersed all over corneal tear film 1. After 15-45 sec. Film breaks and breakpoints occur (dry spots ). Drying of the corneal surface might not be only the result of evaporation (evaporation should be 10 minutes to dry cornea).

Mechanism Holly - Lemp2; tear film thins gradually first by evaporation. Since the thickness reached a critical level, some lipid molecules adhere to the mucus layer and interfere with it. Once mucus layer is mixed with more fat it becomes hydrophobic and tear film break.

Dynamics of tear film during blinking (Described by Holly 1980)

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During blinking the upper eyelid downs to compress the lipid layer surface between the edges of eyelids. The lipids are mixed with the palpebral mucus. So are forming thread-like mixtures that reach the inferior fornix. When open the eye lipids dispersed in a single layer by the action of the upper eyelid. Lipids in excess disperse and the second lipid layer is forming in one second.

Lipids in their dispersion draw tears and thickened aqueous tear film.
- Foster environmental assessment
- Examination of tears film 3

Breaking time of tear film (BUT) would correlate with ocular index. It is the ratio between BUT and the interval between two successive blinks. When the latter exceeds BUT same corneal areas remain dry and may induce symptoms of dryness. Test the stability of the tear film-BUT - abnormal in 10 seconds.

Tear volume (Schirmer) test is considered abnormal when after 5 minutes <10 mm without anesthesia or < 5 mm with anesthesia.

- Tear osmolarity4 values over 316 mOsm / L. Relevant Ocular surface examination (staining) Sodium fluorescein examination, used during the BUT color areas where there is a rupture of intercellular connections which allow the access of stain.
- Rose Bengal stain examination-stain the cell zones which suffers after have lost mucus coating.
- Green lissamine is used to grading the damage of conjunctiva.
- Sensitive or suffering adoptive environment

Often the adoptive environment could have a chronic condition before adopt the topical glaucoma treatment. It is a multifactorial disease of the ocular surface and lacrimal system with symptoms like eye dry eye 3; quantitative and qualitative impairment of the tear film, tear film instability, blurred vision, dryness, associated with damage to the ocular surface.

Disorders of lipid - layer chronic blepharitis
- Aqueous - deficient KCS, idiopathic systemic diseases
- Deficit of mucin - hypovitaminosis, ocular cicatricial pemphigoid, Stevens-Johnson induced by burns
- Eyelid function disorder, exposure keratitis, simblefaron, pterygium.

Epiteliopaties - anesthetic cornea, epithelial irregularity.

In such a cases the adoption of a topical glaucoma treatment may exceed the functional availability of the ocular surface and the other alternative treatment modalities (surgery, laser) should be taken into account. Otherwise topical treatment may exacerbate existing symptoms and pathology and patient compliance decreases.

This is the unfortunate situation in which topical treatment of glaucoma does not meet the adoptive environment conditions. So topical treatment of glaucoma should be changed with laser or surgery.

- The treatment/ adopted
- The topical drops in treatment of glaucoma containing an active substance and various accessories5 to correcting pH, osmolarity, sterility etc of solution.

Both active components and accessories can induce changes in a normal ocular surface and disturbing it, may disturb its poor functionality or may aggravate a prior suffering. Chronic administration of substances regardless of their nature challenge functions of the ocular surface. Effects on the ocular surface may be determined by the active substance contained therein or preservatives and the degree of damage is related to the nature of the preservative, the number of administrations and the number of drugs used.

Preservatives are substances which prevent the development of bacterial germs by action on their direct cytotoxic effect or by lysis of the cell membrane to the cytoplasm lost.

There are two classes of preservatives:
- detergents oxidizers
- Benzalkonium chloride (BAK) Stabilised oxycchloro complex (SOC / purity)
- Polyquaternium-1 (Polyquad) Sodium perborate (GenAqua ) Sofzia

Detergent preservatives acts as surfactants that alter cell membrane permeability resulting lipid dispersion (tear film destabilization) 5 and lysis of cytoplasmic contents Benzalkonium chloride (BAK or BAC) 6 is most used preservative in glaucoma drops and in over 70% of glaucoma solutions bottles. The concentrations of 1/10 can cause cell necrosis and 1/100-1/10000 concentrations can cause apoptosis of goblet cells, or endothelial trabecular cells 6,7,8,9

Oxidants preservatives penetrate the cell membrane and affect cellular functions by altering microbial lipids, proteins and DNA

Their action to destabilize the membrane is lower than that of detergents11. Animal and human studies have indicated that the preservatives can induce inflammation affecting ocular surface 10,11,12.

Sometimes the active substance may have toxic effect, topical carbonic anhydrate inhibitors may affect corneal endothelium 13,14.

Epidemiological studies have shown that drops without preservatives caused fewer symptoms and signs of the ocular surface. 16,17.

In a large proportion of patients with glaucoma topically treated ocular surface is affected 18,19.

How can influence topical treatment of glaucoma ocular surface?

The topical treatment of glaucoma can affect the ocular surface with the appearance of symptoms and signs20: dryness, tearing, burning, foreign body sensation, photophobia or visual impairment. In cornea and conjunctiva may appear superficial punctate keratitis, allergic manifestations or tear film instability.

Superficial punctate keratitis occurs frequently after topical administration of prostaglandins, beta-blockers or pilocarpine and is more frequent in preparations with preservatives25.

Manifestations of allergic reactions is type I- mediated by IgE or type IV. They are induced by the active substance or preservatives and they manifest through burning, chemozis, conjunctival hyperemia or eyelid edema 21,22.

Tear film instability 23,24 is the most frequent effect of topical glaucoma therapy. It may be objectified by the BUT, Schirmer test, tear osmolarity or exam of Meibomius glands.

Effect of the ocular surface due to topical glaucoma therapy may affect treatment compliance and thus decreasing the tolerance to the treatment. Of asymptomatic disease glaucoma can become a disease with symptoms of dry eye. The adoptive environment can not tolerate the adopted element.

How to treat glaucoma, sparing ocular surface.

There are not templates to adapt topical glaucoma therapy to the suffering ocular surface. There are only individual cases and even asymmetry between the two eyes in the same indivd. AMT, v. II, no. 1, 2014, p. 66
Adequacy of treatment for ocular surface evaluation of the deficits and their compensation: lubricants, short term corticosteroid administration. Allergic reactions may require discontinuation for short-term or replace drops and toxicity would indicate the use of single-dose preparations or without preservatives.

Selection of topical treatment of glaucoma according to dosage and their toxicity to ocular surface (less preservatives 26, 27, reduced dosage). Prolonged treatment with preparations containing high concentrations (<1/1000) BAK certainly causes severe damage to ocular surface 28,29,30

Consider topical glaucoma treatment symptoms; ocular surface symptoms of distress in these patients can be the only ocular symptoms, the patient may overstate them avoiding treatment.

May be symptoms without objective support and can be objectified deficits without symptoms.

In the chronic glaucoma, the constant risk factor is age and ocular surface undergoes a sharp decline with age. Under these conditions any prolonged topical therapy is a strength test.

**CONCLUSIONS**

A periodic evaluation of ocular surface would pinpoint its suffering, before symptoms turn glaucoma from an asymptomatic disease in one troublesome.

Every adoption is a complex act whose purpose depends on the baseline (foster environmental awareness, the correct choice of the adopted) and continuous harmonization relationship between the two factors.

Topical therapy of glaucoma may be viewed as a special adoption.

Who would grant an adoption of a deficits elder family with multiple vulnerabilities especially when one adopted is liable to create problems even though foster (ocular surface) is a normal environment?

Ocular surface is instead a sublime harmonies, topical therapy of glaucoma is the science of integrating certain topical glaucoma treatment in this harmony and maintain it.

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SICS – SOLUTION INDUCED CORNEAL STAINING

SIMONA RADU

Abstract: The introduction of silicone hydrogel lenses for daily wear use in combination with the available solutions led to the realization that preserved multi-purpose solutions interact differently with this lens materials. Certain lens-solution combinations have been identified as inducing increased amounts of corneal staining, often referred to as “solution-induced corneal staining” or SICS. This is a transient condition characterised by superficial punctate staining and typically presents as diffuse corneal staining in at least four of the five corneal regions. This staining may present evenly across the cornea or in a more annular pattern with greater density in the periphery, and may or may not be associated with symptoms of discomfort and poorer subjective vision. Although the underlying etiology and clinical relevance of SICS is still being debated, clinicians should aim to monitor for the development of SICS at the appropriate time points and also aim to minimise its occurrence by selecting appropriate lens-solution combinations.

Cuvinte cheie: staining cornean, soluţii de întreţinere a lentilelor de contact

The use of silicone hydrogel lenses for daily wear with multi-purpose solutions (MPS) has been paralleled by the realization that preserved MPS interact differently with different lens materials and induce changes on the ocular surface.(1,2) Solution-induced corneal staining, or SICS, is characterised by diffuse punctate staining (extent grade 1 and above) in at least four of the five regions (central, superior, inferior, nasal and temporal) of the cornea, frequently described as presenting in an annular pattern.(2,3) It is unclear whether the variation in presentation pattern is patient- or product-dependent or simply a factor of the SICS time-course, but there are 2 types described: Peripheral (Figure no 1) and Diffuse (figure no2).(4)

Differential diagnose of peripheral SICS can be made with dehydration staining and limbal transition pooling. It is a transient condition. Depending on the combination of products, maximum staining is observed one to two hours following lens insertion. After four or more hours of lens wear, there is considerably less evidence of corneal staining.

What is Staining
Sodium fluorescein has been used as an ophthalmic dye and indicator of ocular surface health for over 100 years, the hyperfluorescence observed through slit lamp bio-microscopy, being named “fluorescein staining”. However, cellular mechanisms involved in the staining of corneal epithelial cells following exposure to MPS-lens combinations are poorly understood.

Historical theories: sodium fluorescein staining has been thought to be a result of one of three mechanisms: pooling in areas of shed cells, ingress around cells due to loss of tight junctions, inside dead or desquamating cells.(5)

The cellular response behind the transient corneal staining seen in SICS is still controversial. Fluorescein has been shown to enter the epithelial cell cytoplasm in some cases, supporting the theory that staining is indicative of cellular compromise.(6) An alternate theory suggests that SICS simply

Rezumat: Introducerea lentilelor de contact din silicon hidrogel pentru purtare zilnică în combinație cu soluțile de întreținere existente a evidențiat faptul că soluțiile multifuncționale cu conservant interacționează diferit cu diversele materiale ale lentilelor de contact. S-a constatat că utilizarea anumitor combinații de lentile și soluții poate avea ca rezultat apariția unei colorări accentuate cu fluoresceină a suprafeței corneene, definită ca SICS (“solution-induced corneal staining”). Aceasta se manifestă prin staining punctat superficial transitoriu, tipic sub o formă difuză, în cel puțin patru din cele cinci regiuni corneene, uniform sau inelar, cu o densitate mai mare în periferie. Poate fi asimptomatic sau asociat cu manifestări clinice de disconfort și reducere a vederii subiective. Deși etiologia și relevanța clinică a acestor fenomene este încă în dezbatere și studiu, clinicienii ar trebui să identifice și monitorizeze dezvoltarea SICS și să reducă incidența acestui fenomen prin selectarea unei combinații potrivite de lentile și soluții.

Keywords: UV corneal staining, contact lens solutions

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illustrates the binding of fluorescein to epithelial cells, with the care product’s preservative molecule acting as a binding agent, situation called “preservative-associated transient hyperfluorescence– PATH”.(7)

Impression cytolgy and confocal microscopy provides evidence that sodium fluorescein was localized to cells and not to the intercellular spaces, primarily in cells from the superficial layer, but also in the first three layers of cornel epithelium.

Other laboratory studies, with cells under both stress and normal conditions, using both in vitro and ex vivo models, all point to a mechanism whereby fluorescein enters live cells by some form of active transport, which is absent in a dead cell.(8,9)

Flow cytometry shows that 30% of human corneal epithelial cells exposed to MPS displayed signs of early and late necrosis and had lost their mitotic activity.(10)

Cause

SICS can be caused by the interaction between three elements: contact lenses (material, surface, deposits), solutions (disinfectants, surfactants etc) and ocular surface (ex.dry eye)

Silicone hydrogel lenses have a more complex structure than hydrogel lenses. They include between 24% and 74% water content, hydrophobic silicone in various forms, some fluorine species, internal wetting agents and some of them have surface treatments for increased wettability.

There is adsorption of MPS components into silicone hydrogel lenses and subsequent release over minute to hours long and it can affect the microbial efficacy of the MPS and is also believed to affect corneal biocompatibility. Roughness of the surface may increase ocular irritation, protein secretion and microbial adhesion.

Care system design has tried to achieve a balance between microbial efficacy, consumer convenience (ease of use), patient comfort and unwanted effects of lens care system components on the lens and the eye, but there are many components that can be involved.

As multipurpose contact lens solutions (MPS) are used primarily for the cleaning and desinfetcting of contact lenses, they consist of an antimicrobial agent for disinfectant and preservative qualities, a surfactant, a chelator which may have antibiotic properties, wetting agents and a buffering agent to maintain pH of the solution. These agents must be efficacious in killing microbes but also bio compatible with the ocular surface. There are also differences in physical properties - pH, osmolality, surface tension, viscosity. The main disinfectant agents are: Polyhexamethylene biguanide (PHMB), Polyquaternium-1 (Polyquad), Myristamidopropyl dimethylamine (Aldox), Polyaninopropyl biguanide, Hydrogen peroxide. There are a variety of surfactants: Poloxamer, Poloxamine, Pluronic, Tetronic. Surfactant-lens interaction was found to be influenced by the hydrophobic content and molecular weight of the surfactant and charge and lens surface hydrophobicity.

Poor tear quality is a predisposing factor for SICS.(11)

Protein and lipid deposition is also influenced mainly by the wearer. Variation in patient lipid deposition levels is much more significant than the variation in protein deposition. The composition of the lipid differs not only between wearers but also between left and right eye.

Studies

Solution-lens interaction was studied first by Andrasko Study, and the results were presented in a grid (12) (Andrasko Staining Grid-www.staininggrid.com). It is based on results obtained by soaking a lens overnight in a particular solution and then recording the average percent of corneal staining (by area) after two hours of wear the following day with that combination. The results were controversial, so the Institute for Eye Research (IER) started Matrix Study with another approach: patients were followed for three months of wear in each of 16 lens care/silicone hydrogel lens combinations, on a normal daily wear and the incidence of SICS was recorded. The results showed that 73% percent of the cases were bilateral, the majority of eyes (61 %) exhibited diffuse staining, with 39 % exhibiting peripheral staining, the likelihood of peripheral SICS was not influenced by lens type and 23% of patients presented with diffuse staining SICS in one eye and peripheral SICS in the other eye.(13)

In both studies, different care systems used with the same silicone hydrogel lens produce different staining rates. In the acute exposure model some products preserved with polyhexamethylene biguanide (PHMB) are more likely to result in higher levels of SICS in an acute exposure model, however, on longer exposure periods polyquad-preserved products can result in more SICS than certain PHMB-preserved products.

The difficulty in comparing information from the IER Matrix Study and the Andrasko Staining Grid is that the Andrasko Grid reports a mean area of the cornea affected after two hours exposure while the IER data is incidence of SICS from a clinical study over three months.

There is agreement on the fact that Hydrogen peroxide caused far less corneal staining with silicone hydrogels than did any of the multipurpose solutions (MPS) (for all lens types combined, p<0.001). The virtual absence of any SICS when using a peroxide care system with any of the silicone hydrogels suggests that it's the method of choice to avoid this type of corneal insult.

Clinical significance of SICS – still on debate!

The condition can be relatively asymptomatic,(14) despite high levels of SICS, but this can be explained by the decrease in corneal sensitivity, as lens care products may disrupt normal ocular surface sensory neural function. Other studies have reported reduced comfort,(15) with “burning” as the most frequently reported symptom, most prevalent upon lens removal.(16)

A retrospective study showed that higher levels of SICS are associated with higher levels of contact lens discomfort and a three-times greater risk of corneal infiltrative events(17) , but other research done concerning the association between SICS, rate of infiltrative events and specific tear film inflammatory markers have different results.(18)

There is no evidence of a causal relationship between SICS and the occurrence of MK in individual patients and also no such association for any type of staining, whether solution-related or not, as the rates of infection have not changed over the past 25 years (1/2500 wearers/year in daily –wear and 1/500 wearers/year in extended wear).(19)

Prevention, detection and management

Diagnostic and treatment of dry eye, fitting daily disposable lenses, choosing a “safe” combination of lens material and care product are suggested in order to prevent SICS.

Patients should be advised to wear the lenses when coming to first check-up, in the 1st month of wear and routine follow-up. Detection of SICS is simple, by removing lenses during appointments, regardless of the absence of symptoms, and undertaking a thorough fluorescein examination. There are recommended strategies when the level of staining is significant: rub and rinse prior to insertion of the lens (20), use of peroxide

AMT, v. II, no. 1, 2014, p. 70
care systems or another MPS (12,13,21) or even avoiding the use of solutions by refitting the patient into daily disposables.

**Conclusions:**
Much further work is being undertaken to understand the relevance of SICS, but it has become clear that it is not simply a solution-related phenomenon; it also depends on the lens material with which a solution interacts. Fluorescein use should become a routine for patients follow-up.

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OCULAR SURFACE CHANGES AFTER STRABISMUS SURGERY

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Keywords: ocular surface, strabismus surgery

Abstract: Most of surgeries addressed to the ocular globe induce changes in ocular surface integrity and functionality. All the extraocular muscles (EOM) can be operated, one or more muscles on the same eye in the same session. Surgery can induce trauma of the conjunctiva by different types of inappropriate incisions or inadequate closure. Conjunctival vicious scarring is possible after multiple surgeries. The postop topical treatment can also influence the conjunctival healing but in the same time, produces changes in tear film quality and quantity (especially when the topical steroids are postoperatively used for long time) producing changes in ocular surface integrity. Special types of strabismus can influence also the ocular surface by their specificity and consequences on the eyeball position in the orbit and lid closure after surgery.

Most of surgeries addressed to the ocular globe induce changes in ocular surface integrity and functionality. More than other surgeries, strabismus surgery can cause different changes in ocular surface from minor to very important complications. As a general rule, there are few ideas which should be mentioned regarding strabismus surgery.

All the extraocular muscles (EOM) can be operated, one or more muscles on the same eye in the same session. Surgery can induce trauma of the conjunctiva by different types of inappropriate incisions or inadequate closure. Conjunctival vicious scarring is possible after multiple surgeries. The postop topical treatment can also influence the conjunctival healing but in the same time, produces changes in tear film quality and quantity (especially when the topical steroids are postoperatively used for long time) producing changes in ocular surface integrity. Special types of strabismus can influence also the ocular surface by their specificity and consequences on the eyeball position in the orbit and lid closure after surgery.

The Recti Muscles sustain the anterior segment perfusion. By detaching all four Recti or less can be affected the iris, the pupil, cornea and whole eye resulting in Anterior Segment Ischemia (ASI), the most vision threatening complication of strabismus surgery. Subsequently, the four recti muscles should not be operated in one eye in the same session. It is also mandatory to avoid in operating two vertical Recti and one horizontal rectus in the same eye. The Oblique Muscles are not involved in anterior segment irrigation. The limbal incisions induce more invasive changes in ocular surface and limbal architecture while the fornix incisions are less invasive but according to latest studies case can induce reversible damages on Goblet cells (1). Anterior Segment Ischemia

Olver and Lee grade (2) describes the anterior segment ischemia evolution stages as follows:

- Grade I= decreased iris perfusion
- Grade II= pupil signs
- Grade III= II+ uveitis
- Grade IV= III+ keratopathy.

Grade IV anterior segment ischemia can cause permanent damages to the eye with reduction of vision from cataract, corneal scarring, and retinal (macular) changes.

Ocular surface complications after strabismus surgery can be classified as follows:

CORNEA

1. Dellen
2. Corneal abrasions consecutive to surgical trauma
3. Corneal ulcer in patients with III-nerve palsy with Bell phenomena absence

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AMT, v. II, no. 1, 2014, p. 72
CONJUNCTIVA

1. Inadvertent Advancement of the Plica Semilunaris
2. Retraction and Coiling
3. Chemosis
4. Pyogenic granuloma
5. Prolapse of Tenon’s Fascia
6. Epithelial Inclusion Cyst
7. Conjunctival Adhesions

All this complications are possible and are the direct consequence of an inadequate surgical technique of incision and wound closure.

Dellen

Dellen is characterized by corneal thinning at limbus. The lesion is caused by dehydration and the lack of corneal lubrication because of the ocular surface irregularities. The patient has discomfort and photophobia. Usually is not accompanied by infection, the corneal staining is not present but can be confounded with and peripheral ulcer. It happens more frequent in: limbal incision, more than two operated Recti, re-operation, thyroid orbitopathy, incomplete blinking, severe chemosis, conjunctival haemorrhage, all situations when and uniform lubrications of the ocular surface is not possible.

Treatment: The Dellen requires aggressive lubrication +/- topical steroids. If correctly treated, “restitutio ad integrum” is predictable.

Particular Types of Strabismus

A special attention requires the strabismus present in the dysthyroid associated orbitopathy (TAO). The most affected muscle is the inferior rectus which usually should be recessed in order to correct hypotropia and to restore binocularity. This surgery is often followed by inferior lid-lag which connected with the associated dry eye and proptosis can lead to exposure keratopathy. In these terms the postop treatment imposes adequate lubrication of the ocular surface, rigorous follow-up and urgent lid repair.

There are also few other special types of strabismus which request more attention than others. For instance, in III-nd Nerve Palsy accompanied by Bell’s phenomena absence the ocular surface is more threatened than in the same type of palsy where the Bell Phenomena is present and corneal ulcers are not common after strabismus surgery.

Dry eye in strabismus patients

Old patients sometimes need surgery for paralytic strabismus or restrictive strabismus. The age is a risk factor considering the age related tear film dysfunction. Most of the aged patients have Meibomius gland dysfunction or hyposecretor dry eye and ocular surface healing can be delayed.

The dry eye accompanies also most of the autoimmune diseases which can generate operable strabismus as myasthenia gravis or multiple sclerosis.

Another particular type of strabismus which usually needs surgery is Moebius Syndrome in which the blinking and lacrimal secretion are compromised. The ocular surface lubrication after surgery has to be a priority accompanying the postoperative treatment.

The Surgical Technique

The Incision: Limbal incision can be used for all recti muscles. Large incisions produce more profound changes in ocular surface, larger edema, longer recovery and limbal scaring comparatively with fornix incision.

Inadequate technique of closure, edema, haemorrhage, vicious scaring can lead to Dellen and the previous mentioned changes in ocular surface.

Vicious scaring of conjunctiva

Scarring after strabismus surgery is caused by inadequate closure, conjunctival retraction (Fig.1 a and b), plica and caruncule destruction

Figure no. 1. Thin sclera and vicious scarring of conjunctiva due to an original weakening procedure of Medial Rectus Muscle.

Figure no. 2. Conjunctival symblepharoma in the temporal region due to multiple surgeries and inadequate approach.

The conjunctiva can be fixed in these situations by scar resection and conjunctival recession with excellent results.(3,4)

Sutures

The used sutures for conjunctiva in strabismus surgery are absorbable 8-0 or 7-0 Vicryl.

They can produce intolerance, conjunctival irritation, itching in particular situations.

Inadequate closure can cause infection, edema, vicious scarring, chronic inflammation and neovascularization, cysts

The postop treatment

Prolonged topical steroids treatment can induce dry eye. Successful treatment should be accompanied by adequate lubrication in high risk patients.

Contact lenses after strabismus surgery

Can be adapted if the ocular surface is uniform and there is no vicious scaring. In special situations as after multiple strabismus surgery where cornea can be vulnerable to ischemia.
and hypoxia, caution is necessary. The CL adaptation requires more than usual a healthy tear film and the patient needs a more frequent follow-up. The extended wear soft contact lenses are not recommended but RGP lenses can be a good choice in particular situations.

**Conclusions:**
Strabismus surgery by it self can cause damages on ocular surface and should be provided after an adequate patient examination and complete diagnosis.(5)

The postop treatment should be adapted to the ocular surface particularities. Inadequate surgical technique can compromise ocular surface integrity and lubrication. The vicious scaring can be fixed by conjunctivoplasty followed by adequate topical treatment.

Contact lens wear is not prohibited but should be personalised.

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KERATOCONUS AND SLEEPING

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Keywords: keratoconus, obstructive sleep apnea

Abstract: The pathophysiology of how keratoconus develops and progresses is not well understood. Genetic factors appear to be fundamental. However, environmental and behavioral factors may play a major role in the progression of keratoconus. The keratocyte apoptosis is accelerated in patients with keratoconus. Minor external traumas, such as eye rubbing, pressure and warm applied on the eye during sleep and poorly fitted contact lenses can release cytokines from the epithelium that stimulate keratocyte apoptosis. The goal of the paper is to analyze the correlation between patients’ position during sleep and the development and progress of keratoconus. Method. 88 patients with keratoconus have been interviewed by phone regarding allergies, eye rubbing, sleep position and symptoms related to sleep apnea. 18 patients with moderate or severe keratoconus (stage 3 or 4) on one eye and subclinical keratoconus (stage 1) on the other eye were found (Group 1). Results. 12 patients (66,7%) from group 1 stated that they sleep on the side with the eye with more advanced keratoconus. Out of them 9 declared sleeping exclusively on the side with the eye with more advanced keratoconus. Sleep apnea symptoms have been identified in 10% of interviewed patients. Conclusions. Patients with keratoconus and their children must be advised to avoid eye rubbing and sleeping positions which apply pressure and warm on the eye, and must be questioned about sleeping apnea symptoms. If they are present, the patients have to be referred to nighttime polysomnogram.

INTRODUCTION

The etiology of keratoconus (KC) is not yet fully understood.

The role of genetic factor is proved both by higher frequency of KC in some families, by identification of monozygotic twins with KC, as well as by association of KC with different genetic conditions such as Down’s syndrome, Ehler’s-Danlos syndrome, Leber's Congenital Amaurosis and atopy(1,2).

When telling patients that this is a genetic disease, they are right to ask why nobody in their family recorded it. The effect of environmental or behavior factors might be a reasonable explanation. Identifying some trigger factors in the appearance of the disease would lead to reducing incidence and progression of KC.

Another legitimate question is why KC advances more in one eye than in the other. Is the patient guilty for this evolution?

Mechanical factor in appearance and progression of KC is mentioned in a lot of medical articles.

One of the most important mechanical factors associated with KC progression is the chronic habit of abnormal eye rubbing. Kandarakis et al. described one case of bilateral KC caused by compulsive eye rubbing in one patient with Tourette syndrome. Coyle reported the case of an 11 old boy how discovered at age of 5 that he could stop his paroxysmal

Cuvinte cheie: keratocon, apnee obstructivă de somn

Rezumat: Fiziopatologia apariției și progresiei keratoconului nu este bine înțeleasă. Deși factorii genetici par a fi fundamentali, factorii de mediu și comportamentali pot avea un rol major în dezvoltarea bolii. Apoptoza keratocitelor este accelerată la pacienții cu keratocon, iar traumatismele externe minore precum frecatul ochilor, presiunea și căldura aplicată pe glob în timpul somnului și adaptarea inadecvată a lentilelor de contact pot determina eliberarea de citocine la nivelul epiteliului, care stimulează apoptoza keratocitelor. Scopul lucrării a fost de a analiza corelația dintre poziția în somn a pacienților si apariția și dezvoltarea keratoconului. Metoda. 88 de pacienți cu keratocon au fost intervievați telefonic asupra alergiilor, obiceiului de a freca ochii, poziției în somn și simptomelor specifice apneei de somn. Au fost identificați 18 pacienți care prezentau keratocon moderat sau avansat (stadiul 3 sau 4) pe un ochi și keratocon subclinic (stadiul 1) pe celălalt (Grupul 1). Rezultate. 12 pacienți (66,7%) din grupul 1 au afirmat că dorm pe partea cu ochiul care prezintă keratocon mai avansat. Simptomele de apnee de somn au fost identificate la 10% dintre pacienții interviuați. Concluzii. Pacienții cu keratocon și copiii lor trebuie sfătuți să evite frecatul ochilor și pozițiile de somn în care se face presiune sau căldură pe ochi și trebuie chestionați asupra simptomelor specifice apneei de somn și îndrumați pentru polisomnografie în cazul identificării acestora.

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AMT, v. II, no. 1, 2014, p. 75
atrial tachycardia by vigorously massaging his left eye. By age 11 he developed unilateral KC in respective eye (2).

Allergy and atopy are the most commonly factors for chronic habit of abnormal eye rubbing in KC(2).

The role of atopy in KC is controversial, some studies showing that there is not a statically significant difference between control group and keratoconic patients, while Kaya et al. observed that in patients with KC and atopy cornea is steeper and thinner than in patients with KC without atopy(2). The itching induced by atopy which leads to eye rubbing seems to be the most important factor in KC(2).

Another important mechanical factor is the pressure on the eye during sleep. Carlson reported two cases of unilateral KC who admitted that they slept exclusively on the affected side in one position that placed considerable pressure on the eye. The same author mentioned that he observed patients’ tendency to sleep on the side that is more severely affected or progressing faster. Some of these patients sleep with their hand or arm directly against their eye or hug their pillow in a manner that generates some compression around their eyes. Carlson states that even the milder cumulative pressure can have effect over time. To this adds the thermal effect of pillow pressed on the eye, which reduces normal heat dissipation.(1)

The keratocyte apoptosis is accelerated in patients with KC. Minor external traumas, such as eye rubbing, pressure and warm applied on the eye during sleep and poorly fitted contact lenses can release cytokines from the epithelium that stimulate keratocyte apoptosis.(3)

Sleep apnea is a respiratory disorder defined by repetitive episodes of apnea lasting for at least 10 seconds, associated with hypoxia. Obstructive sleep apnea (OSA) is characterized by cease of air flow despite respiratory impulses, due to obstruction or bottleneck of superior respiratory tract. Common symptoms are loud snoring and excessive sleepiness during day. OSA is associated with heart disease (myocardial infarction, arrhythmia), hypertension, stroke and diabetes. Untreated, it can increase the risk for premature death.

An association between OSA and KC has long been suspected. Two recent studies (Saidel et al.; Gupta et al.) emphasized an increased OSA prevalence in KC patients.(4,5) The common factor between the two conditions is speculated to be collagen synthesis or sleep position which may be explained by insufficient OSA diagnosis in Romania or by the youngness of the studied group (average age of 36 years), knowing that OSA is more frequent after 40 years old.

In Group 1 (total 18 patients with KC stages have been considered using the classification based on disease evolution first proposed by Amsler, and then reported by Hom and Bruce. Stage 1 KC (subclinical) corresponds to 6/6 VA achievable with spectacles correction and is diagnosed by corneal topography. Stage 2 KC (early form) involves mild corneal thinning, without other corneal signs. Stage 3 KC (moderate form) is defined by Fleisher’s ring, Vogt’s striae, absence of corneal opacities, <6/6 VA with spectacle correction, but ~6/6 VA with contact lenses correction, irregular astigmatism between 2.00-8.00 D, significant corneal thinning. Stage 4 KC (severe form) is characterized by cornea steeping >55 D, corneal opacities, <6/7.5 VA with contact lenses correction, severe corneal thinning and presence of Munson sign(5).

RESULTS

Out of the total group, family KC history was recorded in 6.8% of cases (6 patients).

22.7% (20 patients) declared to be diagnosed with allergy. Eye rubbing has been identified as a habit for 80% (16) of patients with allergy and for 41.2% (28) of patients without allergy.

No patients with OSA diagnose have been identified, but some 9 patients (10%) with suspicion of sleep apnea. Such results are different from those in other studies showing OSA prevalence in keratoconic patients of 19.6% - Seidel, and respectively 18% – Grupta, whilst OSA risk evaluated with Berlin Questionnaire in above studies was 53.6%, respectively 39%.

We may consider that not using a specific questionnaire for OSA diagnosis, such as Berlin Questionnaire used in studies mentioned before, may lead to lower identification of OSA risk. On the other hand, the reduced number of patients previously diagnosed with OSA is a fact which may be explained by insufficient OSA diagnosis in Romania or by the youngness of the studied group (average age of 36 years), knowing that OSA is more frequent after 40 years old.

In the total group 38.6% (34 patients) sleep on the side with the eye with more advanced KC, 31.8% (28) state that they put pressure on the eye during sleep and 38.6% (34) maintain warm by pillow or hand.

In Group 1 (table no.), 12 patients (66.7%) stated that they sleep on the side with the eye with more advanced KC. Out of them 9 declared sleeping exclusively on the side with the eye with more advanced KC. In this group 50% put pressure on the eye during sleep and 55.5% maintain warm by pillow or hand.

Table no. 1. Correlations between keratoconus and different habits

CONCLUSIONS

Heat and pressure on the eye during sleeping may be factors favoring KC evolution in people having genetic predisposition.
Keratoconic patients and their children should be advised to avoid eye rubbing and sleeping positions which provide pressure or warm to the eye.

Considering the increased risk of death of OSA patients and the higher OSA prevalence in KC patients, the last ones have to be questioned about OSA symptoms and referred to polysomnogram when identifying such symptoms.

It is known that OSA patients most often prefer ventral or lateral sleeping position, which favors pressure and warm on the eye. Therefore, identifying and treating OSA, especially in case of children and teenagers, may prevent KC inception.

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THE EFFICIENCY OF THE VARIOUS TREATMENT OPTIONS FOR DRY EYE SYNDROME

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Keywords: dry eye syndrome, trehalose

Abstract: The dry eye syndrome is a non-infectious keratopathy which is caused by the cornea and conjunctiva wetting deficit. The treatment aim is to relieve the distress and to prevent the corneal complications. This study followed the evolution of a group of patients diagnosed with dry eye syndrome, who followed for a month a different topical treatment for each eye.

Cuvinte cheie: sindrom de ochi uscat, trehaloză

Rezumat: Sindromul de ochi uscat este o keratopatie neinfecțioasă datorată deficitului umectării corneei și conjunctivei. Tratamentul vizează ameliorarea disconfortului și prevenirea complicațiilor corneene. Studiul de faţă a urmărit timp de o lună un tratament topical diferit la un ochi faţă de altul.

INTRODUCTION

The dry eye syndrome is a non-infectious keratopathy which is caused by the cornea and conjunctiva wetting deficit. The precorneal tear film consists of three layers:

- the outer lipidic layer, secreted by the Maibomius glands
- the middle aqueous layer, secreted by the lacrimal glands (contains proteins, electrolytes and water).
- the inner mucous layer, secreted by the conjunctival glands.

The tear film is stretched over the ocular surface through eye blinking, which is controlled by a neurological system. After a while, the tear fluid drains through the lacrimalnasal pathways. There are three factors responsible for the wetting efficiency of the entire ocular surface:

- the normal blink reflex;
- an intact physiological ratio between the ocular surface and eyelids
- the corneal epithelium integrity

The etiopathogenicity of the dry eye is complex. It can be summarized as falling:

- the lacrimal hyposcretion of the Sjogren syndrome, rheumatoid arthritis, the atrophy or the destruction of the lacrimal gland.
- the changes in the composition of the tear film related to the age, environmental factors, ocular surgery in medical history, chronic medical treatments, A hypovitaminosis.

The symptoms of dry eye syndrome are wide: the foreign body sensation, grittiness, reflex tearing on exposure to hostile conditions (such as wind, cold, low atmospheric humidity) or prolonged reading, photophobia, eye burning, painful blinks.

The clinical signs which can be observed are the following:

- Schirmer test (figure no. 1) (which quantifies the basal and reflex tearing and it provides information about the components of the aqueous tears); it is lower than 10 mm;
- The tear film break-up time provides information about the tear film stability due precorneal mucous content in tears, it is less than 5 seconds (normal it is over 10 seconds).
- On the slit lamp examination it can be seen the vasodilatation of the conjunctival vessels and the perikeratic congestion (figure no. 2).

The lower eyelid is moving the bulbar conjunctiva forming the folds and the tears are not emphasised into the lower eyelid edge.

In the severe cases, the conjunctival congestion is emphasized, the tear film is mucilaginous, and the cornea has a filiforme desepithelisation filamentous, filamentous keratopathy (at the fluorescein staining, it can be seen the corneal lesions, and also it can be observed some small filaments attached to one end to the corneal epithelium and the other end is free and it is mobil at each blinking).

Figure no. 1. Schirmer test

The treatment aim is to relieve the distress and to prevent the corneal complications. Solving the problems related to the dry eye is a challenge to the ophthalmologist. There are many factors involved in the etiopathogenesis of this syndrome. Therefore, the therapy should be directed primarily to the cause. One solution may be to reduce the amount humidification to decrease the evaporation of the tears.

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Figure no. 2. Conjunctival congestion

The substitution treatment consists in artificial tears with different viscosity which depends on the severity of the condition. It can be instilled 2-3 times/day or more often, hourly or even half an hour. The substances which preserve the solutions can be allergens for the conjunctiva, therefore it is preferred the solutions without preservatives. Surgically, it can be performed the temporary or permanent obstruction of the lacrimal points.

PURPOSE

The aim of the study: this study followed the evolution of a group of patients diagnosed with dry eye syndrome, who followed for a month a different topical treatment for each eye.

METHODS

We have studied for a month a group of 25 patients diagnosed with dry eye syndrome aged between 29 and 76 years. It has been proposed to these patients the following treatment:

- OD - artificial tears, 3x/day;
- OS - artificial tears + trehalose, 3x/day.

They were been evaluated weekly: visual acuity, slit lamp examination, Schirmer test, the tear film break-up time (BUT).

After a month of treatment, the patients were asked to complete the following questionnaire:

1) How did you tolerate the product?
   - Good
   - Very good
   - Not so good

2) How your daily life has interfered with the therapy?
   - It did not affect my daily activities
   - Low
   - Important

3) The symptoms:
   - have been improved
   - remained unchanged
   - have been increased

CONCLUSIONS

Following the treatment, the symptoms have been improved in 19 cases and it remained unchanged in 6 cases. In 10 of 19 cases were reported significant improvements to the eye which has received the product with trehalose. No patient accused emphasis of symptoms.

Objectively, it has been observed an important improvement of the tear film break-up time in 4 cases at 3 weeks and 6 cases at 4 weeks of treatment, with better values or dual eye therapy.

In 2 cases the tear film break-up time showed a slight reduction in 3 to 4 weeks. Schirmer test showed no significant changes in testing during the 4 weeks.

Visual acuity did not change in any of the cases.

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AMT, v. II, no. 1, 2014, p. 79
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Keywords: bacterial conjunctivitis, topical treatment, Azithromycin

Abstract: This paper studies the efficiency and the patient compliance of the topical therapy with azithromycin as the first line in bacterial conjunctivitis. We have studied a group of 18 patients aged 3 months to 59 years, who were diagnosed with bacterial conjunctivitis and they received topical treatment with azithromycin. The established treatment was effective in all cases.

Cuvinte cheie: conjunctivită bacteriană, tratament topical, Azitromicina

Rezumat: Lucrarea studiază eficienţa tratamentului şi complianţa pacientului vis-a-vis de terapia topicală cu Azitromicina ca primă intenţie în conjunctivitile bacteriene. Am luat în studiu un lot de 18 pacienţi cu vârste între 3 luni şi 59 ani, diagnosticat cu conjunctivită bacteriană, care au primit tratament topical cu Azitromicina. Tratamentul instituit a fost eficient în toate cazurile studiate.

INTRODUCTION

Bacterial conjunctivitis is a common condition in all age groups with the preference of the children. The infection spreads by direct contact with the infected secretions.

- Newborn:
  - Chlamydiae,
  - Neisseria gonorrhea

- Children:
  - Streptococcus pneumoniae
  - Haemophylus influenzae
  - Staphylococcus
  - Moraxella

- Adult:
  - Staphylococcus aureus
  - Staphylococcus epidermidis
  - Streptococcus
  - E. Coli
  - Neisseria gonorrhoea
  - Pseudomonas
  - Proteus
  - Ser arratia

The signs and symptoms of the bacterial conjunctivitis are wide:

- the conjunctival secretion is aqueous at the beginning and it become purulent causing the agglutination of cilium.
- the eyelids are slightly edematous
- the conjunctival congestion is maximum at the fornix conjunctiva and it is diminished perikeratic, superficial conjunctival hyperemia.
- the tarsal conjunctiva is red velvet with papillary reaction.

For diagnosis, the clinical signs are usually sufficient. The etiologic diagnosis requires the examination of the conjunctival secretion with the antibiogram.

Treatment: Usually the condition responds well to the topical broad-spectrum antibiotics. It is used selective antibiotics, which are disrupting the different stages of the microorganism metabolism.

Aminoglycosides (Gentamicin, Neomycin, Tobramycin) have a bactericidal effect by inhibiting the bacterial protein synthesis. It penetrates the bacterial cell by active transport, which depends on oxygen and diffusion. For this reason, the anaerobic bacteria have a natural resistance to this antibiotics. Aminoglycosides bind to the bacterial 30S ribosomal subunit, with the protein synthesis inhibition by preventing the formation of peptides, through the misreading of the genetic code and the dissolution of polysome in nonfunctional monomers. Their activity depends on the concentration and their postantibiotic effect is maintained for several hours after the plasmatic concentration falls below the MIC.

Fluoroquinolones (Ciprofloxacine, Moxifloxacine, Ofloxacine) have bactericidal activity by inhibiting bacterial DNA gyrase (topoisomerase II) and topoisomerase IV. The action spectrum includes Gram positive bacteria such as S. pneumoniae and S. aureus and gram-negative bacteria such as H. influenzae.

Macrolides (Azithromycin, Neomycin) have a large aliphatic lactone ring. The antibacterial spectrum is narrow, of penicillin type, and it is comprising mainly aerobic Gram-positive bacteria, aerobic gram-positive cocci, anaerobic bacteria, Chlamydia, Mycoplasma pneumoniae, Helicobacter.

If aminoglycosides and fluoroquinolones were wider than macrolides, the macrolide dosage involves to take them for a shorter period of time with a less frequent administration

PURPOSE

This paper studies the efficiency and the patient compliance of the topical therapy with azithromycin as the first line in bacterial conjunctivitis.

METHODS

This paper studies the efficiency and the patient compliance of the topical therapy with azithromycin as the first line in bacterial conjunctivitis.
We have studied a group of 18 patients aged 3 months to 59 years, who were diagnosed with bacterial conjunctivitis. The diagnosis was established clinically and it was completed with the bacteriological examination of conjunctival secretion and antibiogram. The topical treatment with azithromycin was made at the both eyes, 2x/day for 3 days. The patients were followed at 7 and 14 days. At 14 days, the antibiogram was repeated. The patients were asked to complete a questionnaire at 14 days after the first presentation:

1. Did you receive the full treatment (of six doses)?
   a) Yes, I received the treatment as indicated
   b) I have missed some doses
   c) I took azithromycin more times than you indicated
   d) I stopped the treatment.

2. How your daily life has interfered with the therapy?
   a) it did not affect my daily activities
   b) low
   c) Important

3. The patient / your child has:
   a) a sharp distress reaction to the antibiotic instillations
   b) the ocular hyperemia or the eyelid edema emphasized
   c) none of the above

RESULTS AND DISCUSSIONS

At 7 days of treatment:
  o the absence of purulent secretion in 18 cases of 18;
  o the absence of hyperemia in 15 of 18 cases;

At 14 days of treatment:
  o the absence of purulent secretion in 18 cases of 18;
  o the absence of hyperemia in 18 cases of 18;

In 3 cases, the eyelid edema was found.

The analysis of the questionnaire has revealed a good compliance of patients in 15 cases of 18.

The antibiogram recurrence at 14 days showed no pathogens bacteria in all cases.

CONCLUSIONS

✓ the established treatment was effective in all studied cases
✓ the patients compliance was good in most cases
✓ the symptoms were submitted in a short period of time

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OCULAR SURFACE DAMAGE IN A CASE OF ADENOID CYSTIC CARCINOMA OF THE LACRIMAL GLAND - CASE PRESENTATION

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Abstract: The lacrimal gland tumors, are rare eye tumors, and represent 10% from all orbital tumors. From these, 20% of the lacrimal gland tumors have epithelial origin. The most common form of malignant epithelial tumors of the lacrimal gland is the adenoid cystic carcinoma, approximately 50% of the malignant tumors. Frequently, the patients are asymptomatic and the diagnosis is most often established in the advanced stages of the disease. The purpose of this paper is to present the difficulties in diagnosis and the complex therapeutic approach with its side effects, in a case of adenoid cystic carcinoma of the lacrimal gland, in a young patient. Due to asymptomatic evolution, the diagnosis of adenoid cystic carcinoma of the lacrimal gland is lately established, often with severe repercussions on visual function. Sometimes it is presented as a tumor mass in the upper eyelid associated with pseudoptosis, exophthalmos, pain and decreased visual acuity. Being a malignant form and extremely aggressive, it is important the early diagnosis in the asymptomatic stages of the disease.

Keywords: adenoid cystic carcinoma, radiotherapy, ocular surface.

Cuvinte cheie: carcinoom adenoid chistic, radioterapie, suprafața oculară

INTRODUCTION

The adenoid cystic carcinoma of the lacrimal gland is a malignant epithelial tumour, extremely aggressive. It occurs more often in women in the 3rd decade of life. The five year survival rate is of 50% and the 15 years survival rate is 25%.(1,9,10,11)

The symptomatic stage of the disease appears lately, when it is necessary an aggressive surgical treatment associated with radiotherapy to minimize the recurrences. The radiotherapy has a negative impact on the ocular surface, with severe consequences for visual function.

The ocular surface is a complex system composed by the cornea and conjunctiva, and it is covered by the tear film. Anatomic and functional, the ocular surface is dependent on the adjacent structures to fulfil its functions (the free edge of the eyelid with the Meibomius glands, the lashes and their associated glands, the lacrimal system and the lacrimalnosal duct). Any injury brought to the adjacent structures determines the damage of the ocular surface with severe consequences on the visual function.(2,3,8,9)

The aim of the paper is to highlight the importance of the ocular surface integrity of the adjacent structures to preserve the visual function in a case of radiation keratopathy at a patient with adenoid cystic carcinoma of the lacrimal gland and also the effects of the radiotherapy on the ocular surface.

METHODS

We present the case of a patient aged 36 years who has presented in the Ophthalmology Clinic, Academic Emergency Hospital of Sibiu, with radiation keratopathy of the right eye, after radiotherapy treatment for adenoid cystic carcinoma of the lacrimal gland.

The case presentation:

The patient B.O., aged 36 years, mother of two, from urban area, is admitted at the Emergency Hospital of Sibiu, presenting with decrease of visual acuity in the right eye, intense eye pain, photophobia and redness.

The current illness began insidiously 1 month before admission with the decrease of visual acuity of the right eye and moderate eye pain. The symptoms started at approx. 6 months...
after completion of periorbital radiotherapy for adenoid cystic carcinoma of lacrimal gland (36 sessions, 5 x 2.0 Gy / week).

In March 2011 the patient was diagnosed with RE-lacrimal gland tumor, for which it was performed a MRI skull.

**MRI skull (March 2011):** a mass located at the external angle of the right orbit, T1 hyposignal, T2 inhomogeneous hypersignal, with maximum axial dimensions of 25/13 mm, relatively well defined, homogenous gadolinifile, it comes into contact with the outer right oculomotor muscle to which, sometimes, it clears the demarcation interface and i causes mass effect on the eyeball.

**Histopathological diagnosis:** adenoid cystic carcinoma of lacrimal gland with bazaloid pattern (G3), the tumor infiltrates the striate muscular tissue and present perineural invasion; pT4NxMx stage.

**Figure no. 2. HPE nr. 183484/29.03.2011: Cribriform pattern with nests of cells with microcystic spaces filled with muco-hyaline material.**

In March 2011 was performed a subtotal ablation of the tumor and the excised operatory piece was sent for histological examination.

In April 2011, it was performed the second surgical intervention for the excizion of the tumor.

After surgery, it was performed MRI head, which showed a mass located at the external angle of the right orbit, T1 hyposignal, T2 inhomogeneous hypersignal, with maximum axial dimensions of 21/19 mm, relatively well defined, homogenous gadolinifile, it comes in contact with the outer right oculomotor muscle to which, in some places, it clears the interface boundary and it causes mass effect on the eyeball.

**Figure no. 3. MRI skull april 2011**

In July 2011, the patient started the radiotheraphy of the right periorbital region. IMRT radiation of the tumoral region and the branches of the trigeminal nerve, 5 x 2.0 Gy / week to 50.0 Gy ZVD (ZV1), with the increase of the dose (boost) in the tumoral region at 72.0 Gy / GD in 36 sesions. During the radiotherapy treatment, the patient developed at the right eye periorbital and nasal erythema of the skin (grade 1 CTC).

**Figure no. 4. Periorbital and nasal erythema of the skin (grade 1 CTC)**

In August 2012, the patient presented with right eye cornea desепitelization for which she had TCL and topical treatment with corneal epithelizants and antibiotics.

**General clinical examination:**
- TA – 120/ 90, P=72 b/min
- RE VA = pmm
- LE VA = 20/20
- RE corneal
  - opacifications, corneal infiltration
  - perforated corneal ulcer located paracentral inferior
  - conjunctival hyperemia
  - positive Seidel test
  - madarosa
  - the posterior pole of the right eye cannot be visualized
  - the anterior and posterior pole of the left eye were normal.

**Paraclinic investigations:**
- HLG – is normal
- Glucose = 90 mg/dl
- Inflammatory tests – normal
- Hepatic tests – normal
- Renal tests - normal

**MRI skull:** a mass located at the external angle of the right orbit, T1 hyposignal, T2 hypersignal, with maximum axial dimensions of 21/19 mm, relatively well defined, homogenous gadolinifile, it comes into contact with the outer right oculomotor muscle to which sometimes, clears the interface boundary and it causes mass effect on the eyeball.

**CT chest / abdomen / pelvis - without distant metastases. Conjunctival secretion of the RE - normal.**
Positive diagnosis: IRRADIATION KERATOPATHY. PERFORATED CORNEAL ULCER. NEUROTROPIC KERATOPATHY. SICCA KERATOCONJUNCTIVITIS. ADENOID CYSTIC CARCINOMA OF LACRIMAL GLAND.

Differential diagnosis:
1. Bacterial corneal ulcers - are excluded by the conjunctival secretion
2. Corneal ulcers in systemic diseases (rheumatoid arthritis, nodosa polyarteritis, systemic lupus erythematosus, rosacea): unilateral/bilateral peripheral ulcer associated with inflammatory infiltrates - excluded by the laboratory investigations and tests;
3. Herpetic keratitis: the dendritic ulcers are pathognomonic for the herpetic keratitis
4. Recurrent corneal erosion
5. Superior limbic keratoconjunctivitis
6. Sjogren's Syndrome
7. Stevens Johnson Syndrome
8. Hypovitaminosis A
9. Viral Keratitis: Herpes simplex, Herpes zoster
10. Keratopathy caused by UV radiation or heat
11. Exposure keratopathy.

Evolution and treatment:
Without treatment, the evolution is toward complications:
- endophthalmitis
- secondary glaucoma - by iris apposition on the rear face of the cornea which is producing previous synechiae leading to the closure of the irido-corneal angle.
- cavernous sinus thrombophlebitis

Evolution with treatment: the patient had topical treatment with antibiotics, corneal epithelizants, artificial tears (unpreserved). For the tectonic purpose, the patient had amniotic membrane patch grafting and TCL. Postoperatory, the patient had topical treatment with antibiotics and steroids. The treatment response was good, the symptoms have been significantly improved.

Figure no. 5. Five days after the amniotic membrane patch grafting.

Two months after the amniotic membrane patch grafting, the patient was admitted again in the Ophthalmology department with corneal melting and corneal perforation and it was decided the tarsoraphy of the right eye.

Figure no.6: Two months after the amniotic membrane patch grafting

Two months after the tarsoraphy of the right eye, the patient was admitted in the Ophthalmology Clinic of the Emergency Hospital of Sibiu with perforated corneal ulcer at the right eye.

Due to the risk of local and regional complications and because of the impossibility of anatomical and functional recovery, it was decided the evisceration of the right eye.

Figure no. 7. Perforated corneal ulcer

Intra- and postoperative, the evolution was favorable.

Prognosis:
The patient has a poor prognosis due to:
- the residual tumor
- bazaloid pattern
- large tumor
- perineural invasion.
The 5-year survival rate for the bazaloid type of tumor is 21%.
The late prognosis is reserved due to the residual tumor and perineural invasion with the risk of distant metastasis.
The oncologic follow up was performed in the first 2 years at 3 months, and in the 3rd year at 6 months.
The paraclinic examinations were: MRI skull: a mass located at the external angle of the right orbit, T1 hyposignal, T2 hypersignal, with maximum axial dimensions 21/9mm relatively well defined, unchanged from previous examinations.
CT thorax / abdomen → without distant metastases.

Figure no. 8. MRI skull at 3 years

Socio-professional reinsertion: socially, the patient returned back to her previously social life within the family and community.

Figure no. 9. 3 years after the subtotal ablation.

The particularity of the case is given by the heterogeneity of side effects for radiotherapy, despite the unfavorable evolution at the therapeutic attempts to recover the ocular surface, and also the steady dimensions of the residual tumor after 3 years from the subtotal ablation of the tumor.
CONCLUSIONS

- the adenoid cystic carcinoma of lacrimal gland is a malignant epithelial tumor, extremely aggressive.
- frequently, the patients are asymptomatic, often the diagnosis being put in an advanced stage of the disease.
- radiotherapy has many negative side effects on the ocular surface, the most severe is radiation keratopathy.
- the unfavorable prognosis is given by the bazaloid pattern, large tumor and perineural invasion.
- due to its anti-inflammatory, antimicrobial, immunoregulatory and antiangiogenetic effects, the application of the amniotic membrane can be a successful option to recover the ocular surface.

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ETIOLOGY AND TREATMENT OF ACUTE BACTERIAL CONJUNCTIVITIS

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Abstract: Acute bacterial conjunctivitis is one of the most frequent non-traumatic eye disorders describing any inflammatory process of the conjunctiva of bacterial etiology. The objectives of this scientific research are to establish the occurrence of pathogen agents in cases of acute bacterial conjunctivitis and to study the bacteria sensitivity and resistance to antibiotics. Bacteriological records of conjunctival swabs from Sibiu County Clinical Hospital and from Sibiu Pediatric Clinical Hospital examined between 01.01.2008-01.09.2013 were reviewed. The most frequently isolated pathogens were Staphylococcus aureus, Streptococcus pneumoniae and Haemophilus influenzae.

METHODS

We conducted a retrospective study of 401 conjunctival secretions swabs with positive bacteriological examinations and 236 antibiograms belonging to patients clinically diagnosed with purulent conjunctivitis and that underwent treatment in Sibiu Emergency County Hospital and Sibiu Pediatric Hospital between 1st January 2008 - 1st September 2013.

We formed 3 groups by age: 35 infants, 182 children and 184 adults (table no. 1).

Table no. 1. Patients distribution

<table>
<thead>
<tr>
<th>Group</th>
<th>Patients</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>Child</td>
<td>182</td>
<td>17</td>
</tr>
<tr>
<td>Adult</td>
<td>184</td>
<td>17</td>
</tr>
</tbody>
</table>

In this study we included patients that were clinically diagnosed with acute purulent conjunctivitis and that presented in the conjunctival secretion bacteria and white blood cells, the latter being the marker of active infection from a microbiological point of view.

The antibiotics that we followed in the antibiogram results were those with eye drops and eye ointment presentation

INTRODUCTION

Acute bacterial conjunctivitis is one of the most common illness encountered in ophthalmic practice that describes an inflammation of the conjunctiva of bacterial etiology. (Fig. 1)

The most commonly incriminated pathogens are Staphylococcus aureus, Haemophilus influenzae and Streptococcus pneumoniae.(1)

Bacterial conjunctivitis is clinically characterized by: conjunctival injection, purulent secretion, chemozis, eyelid edema, lacrimation, papillae, membranes and pseudomembranes, adenopathy.(2)

PURPOSE

The objectives of this scientific paper are to establish the occurrence of pathogen agents in cases of acute bacterial conjunctivitis by means of bacteriological examination, and to study the bacteria sensitivity and resistance to several ocular antibiotics.

Keywords: early acute bacterial conjunctivitis, bacteriologic examination, Staphylococcus aureus

Cuvinte cheie: conjunctivită bacteriană acută, examen bacteriologic, Staphylococcus aureus

Figure no 1. Acute bacterial conjunctivitis (Casuistry Sibiu County Clinical Hospital)

The antibiotics that we followed in the antibiogram results were those with eye drops and eye ointment presentation

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AMT, v. II, no. 1, 2014, p. 86
form, drugs indicated for the treatment of bacterial conjunctivitis (table no. 2).

<table>
<thead>
<tr>
<th>Aminoglycosides</th>
<th>Quinolones</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gentamicin (Gentosept, Gentamicin Sulphate, Genticol, Optigram)</td>
<td>Ciprofloxacin (Ciplox, Ciloxan, Ciprofloxacina, Coloxan, Ciprolet)</td>
<td>Erthyromycin (Ilorycin, Romycin)</td>
</tr>
<tr>
<td>Neftilmicin (Netildex, Nettacin)</td>
<td>Levofloxacin (Quixin, Iquix)</td>
<td>Chloramphenicol (Betabioptal, Cloramfenicol, Antibiotpal, Sifetcina)</td>
</tr>
<tr>
<td>Tobramycin (Tobrex, Tobradex, Tobisol, Tobrabact, Tobrom, Tobrex X2)</td>
<td>Ofloxacin (Floxac, Oculox)</td>
<td>Colistin (Colbiocin)</td>
</tr>
<tr>
<td>Moxifloxacin (Vigamox, Moxeza)</td>
<td>Co-trimoxazole (Polytrim)</td>
<td>Tetracycline (Colbiocin, Terak)</td>
</tr>
</tbody>
</table>

647 conjunctival secretions were examined between 1st January 2008 - 1st September 2013 of which 61.98% (401) were positive for bacterial pathogens and 38.02% (246) were negative.

- 78.1% (313) of the bacteria identified were Gram+
- 21.9% (88) Gram-. Patients coming from rural areas (54.1%) and were male (52.6%) had a slightly higher frequency than patients coming from urban areas (45.9%) and were females (47.4%).

In newborns & premature group

- the most frequently isolated pathogen was Staphylococcus aureus (48.5%),
- followed by: Klebsiella pneumoniae (14.3%),
- E. coli (11.4%),
- Enterobacter (11.4%),
- Streptococcus pneumoniae (2.9%),
- Pseudomonas aeruginosa (2.9%),
- Proteus mirabilis (2.9%) and
- Enterococcus faecalis (2.9%). (Fig. 2)

In children group the main bacteria identified were Staphylococcus aureus (36.6%), Streptococcus pneumoniae (34.1%), H. influenzae (19.2%), E. Coli (2.2%), Klebsiella pneumoniae (1.6%), Moraxella catarrhalis (1.6%), Pseudomonas aeruginosa (1.1%), Corynebacterium spp (1.1%), Citrobacter braakii (0.5%), Serratia marcescens (0.5%), Enterococcus faecalis (0.5%), Streptococcus pyogenes (0.5%), Streptococcus agalactiae (0.5%). We can observe that there is a clear difference between the percentage of Gram+ (74.7%) and Gram- (25.3%) bacteria (figure no. 3).

In the study “Increasing Bacterial Resistance in Pediatric Acute Conjunctivitis (1997–1998)” the most frequently isolated bacteria in children were Haemophilus influenzae and Streptococcus pneumoniae.(4)

Adult showed a higher occurrence for Staphylococcus aureus (78.3%), followed by Enterobacter (5.4%), Streptococcus pneumoniae (4.3 %), Proteus mirabilis (3.3%), E. Coli (3.3%), Enterococcus faecalis (2.8%), Pseudomonas aeruginosa (1.6%), Haemophilus influenzae (0.5%) and Acinetobacter baumanii (0.5%). Once again prevails Gram+ bacteria with a rate of 85.3% (figure no. 4).

The ophthalmologic literature incriminates as the major cause of neonatal acute bacterial conjunctivitis both Gram+ bacteria like Staphylococcus aureus, Streptococcus pneumoniae, Enterococcus and Gram- bacteria like Haemophilus influenzae, bacterium which was not found in our group of patients.(3)
In other studies, such as “Update on Bacterial Conjunctivitis in South Florida” the main pathological agent incriminated in acute bacterial conjunctivitis in adults was Staphylococcus aureus.(5)

The pathogen most commonly isolated in all age groups was Staphylococcus aureus (56.9%) followed by S. pneumoniae (18%), H. influenzae (9%), Enterococcus (3.5%), E. Coli (3.5%), Klebsiella pneumoniae (2%), Enterococcus faecalis (1.7%), Proteus mirabilis (1.7%), Pseudomonas aeruginosa (1.5%), Moraxella catarrhalis (0.7%), Corynebacterium spp (0.5%), Citrobacter braakii (0.2%), Acinetobacter baumanii (0.2%), Serratia mercescens (0.2%), Streptococcus agalactiae (0.2%), Streptococcus pyogenes (0.2%). The results we have obtained in our study coincide with the literature that presents Staphylococcus aureus as the most common cause of acute bacterial conjunctivitis.(1)

Gram+ bacteria showed increased sensitivity to Gentamicin, Chloramphenicol, Co-trimoxazole and resistance to Erythromycin. Gram- bacteria showed increased sensitivity to Gentamicin, Chloramphenicol, Levofloxacin and resistance to Tetracycline (figure no. 5).

Figure no. 3. Bacteria occurrence in Adults

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Gram +</th>
<th>Gram -</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acinetobacter baumanii 0.5%</td>
<td>21.7%</td>
<td>5%</td>
</tr>
<tr>
<td>H. Influenzae 0.5%</td>
<td>21.7%</td>
<td>5%</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa 1.6%</td>
<td>5%</td>
<td>21.7%</td>
</tr>
<tr>
<td>E. Coli 3.3%</td>
<td>5%</td>
<td>21.7%</td>
</tr>
<tr>
<td>Proteus mirabilis 3.3%</td>
<td>5%</td>
<td>21.7%</td>
</tr>
<tr>
<td>Enterobacter 5.4%</td>
<td>5%</td>
<td>21.7%</td>
</tr>
<tr>
<td>Enterococcus faecalis 2.6%</td>
<td>5%</td>
<td>21.7%</td>
</tr>
<tr>
<td>Streptococcus pneumoniae 4.3%</td>
<td>5%</td>
<td>21.7%</td>
</tr>
<tr>
<td>Staphylococcus aureus 69.6%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Staphylococcus aureus MRSA 0.7%</td>
<td>5%</td>
<td>21.7%</td>
</tr>
</tbody>
</table>

Chloramphenicol is considered to be an antibiotic of first-choice in the treatment of bacterial conjunctivitis having a broad spectrum of action which also results from our study.(6)

Antibiotics used in the treatment of acute bacterial conjunctivitis may have a number of adverse effects:

- **Aminoglycosides**: contact dermatitis, corneal and retinal toxicity, conjunctival hyperemia, superficial punctate keratitis;
- **Macrolides**: minor eye irritation, conjunctival hyperemia;
- **Polypeptides**: blurred vision, eyelid itching, eyelid swelling, tearing, photophobia;
- **Quinolones**: allergic reactions, eye irritation, keratitis with possible perforation;
- **Tetracycline**: severe allergic reactions, papebral swelling, chemozis, conjunctival hyperemia;
- **Chloramphenicol**: aplastic anemia, bone marrow depression, Gray Baby Syndrome;
- **Co-trimoxazole**: marked conjunctival hyperemia, burning senzation, palpebral itching.(7)

**CONCLUSIONS**

- Gram+ bacteria had a much higher frequency then Gram- bacteria;
- The most frequently isolated pathogen in all age groups was Staphylococcus aureus, followed by: Klebsiella pneumoniae in infants, Streptococcus pneumoniae in children and Enterobacter in adults;
- Both Gram+ and Gram- bacteria were most frequently sensitive to Gentamicin and Chloramphenicol, so these antibiotics may be recommended with confidence to treat bacterial conjunctivitis course taking into account the adverse effects they may generate.

**REFERENCES**

OCULAR PEMPHIGOID-CASE PRESENTATION

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Keywords: ocular pemphigoid, anikloblepharon, use of amniotic membrane.

Abstract: Mucous membrane pemphigoid is an autoimmune mucocutaneous blistering disease caused by the presence of antibodies production against components of the basement membrane with ocular manifestation that can lead to devastating results. In this presentation I will talk about a case diagnosed in an advanced stage of Ocular Pemphigoid, discussing the therapeutic approach using amniotic membrane graft and therapeutic lens to restore the ocular surface, and the functional and aesthetic results.

Cuvinte cheie: pemphigus ocular, anikloblefaron, refacerea suprafetei oculare, utilizarea membranei amniotice.

Rezumat: Pemfigusul conjunctival este o afecțiune autoimună caracterizată prin prezenta de anticorpi antimembrană bazală cu manifestări conjunctivale uneori devastatoare. Lucrarea de față prezintă cazul unui pacient cu Pemfigus ocular în stadiu avansat și modalitățile terapeutice utilizate cum ar fi transplantul de membrană amniotică, aplicarea lentilei de contact terapeutice cu scopul refacerii suprafeței oculare și rezultatele obinuțe atât din punct de vedere funcțional cât și estetic.

CASE REPORT

75 years old male patient, retired, from country side, presents with bilateral decreased visual acuity, epiphora and mucosal secretions.

PMH:
- chronic conjunctivitis,
- trichiasis, symblepharon,
- linear IgA dermatitis,
- HTN, presbycusis.

HPC: In 2010 patient started to present multiple skin and mucosal erosive lesions at the level of the nose, mouth, conjunctiva and pharynx.

Patient had multiple admissions under dermatology where investigations revealed a biologic inflammatory syndrome and at direct immunofluorescence method showing basal membrane IgA deposits and mild C3 positive.

In the SCIU Sibiu Ophthalmology Clinic, patient presented with advanced ocular changes needing surgical reconstruction of the ocular surface (figure no. 1).

Figure no. 1. Patient on admission

At the first admition in our clinic patient had bilateral visual acuity of light perception, total ankyloblefaron (figure no. 2) at biomicroscopy and the back of the eye could not be examined.

Figure no. 2. Total Ankloblefaron RE and LE

Other investigations showed VSH of 40mm/h and direct immunofluorescence method showed basal membrane IgA deposits and mild C3 positive.

The differential diagnostic was done with chemical burns, Stevens-Johnson Syndrome, dermatological lesions, drug induced bullosa, erythema multiforme, paraneoplastic pemphigus, bullous pemphigoid, epidermolysis bullosa and pemphigus vulgaris.

Disease evolution:
Without treatment - progresses to persistent corneal epithelisation, perforations, neovascularization, glandular meibomian dysfunctions, endophthalmitis, glaucoma, blurry vision. With treatment – disease progression is slower and improved symptomatology, better visual acuity, prevents complications and blurry vision.

Our patient had the evolution complicated at the right eye:
- stromal ulcer (figure no. 3),
- corneal perforation
- corneal leukoma (figure no. 4).

Figure no. 3. RE stromal ulcer

AMT, v. II, no. 1, 2014, p. 89
Treatment: Ocular pemphigus treatment is non curative, can be conservative or surgical, to prevent complications.

1. Conservative management – with medication
   - Steroids (prednisolone), DAPSONE as anti inflammatory drug, immunosuppressive (Imuran) and gastric protection medication.
   - Local topical steroids and NSAD’s, mydriatics, cycloplegics, corneal re-epithelialization drugs, antibiotics, lubricants.

2. Surgical treatment- Was in multiple stages aiming for ocular surface reconstruction. The first intervention was done on the right eye, the second to the left eye consisting of canthotomy and amniotic membrane transplant for the reconstruction of the conjunctival sac (figure no. 5).

Third intervention was bilateral eye tarsus anterior subluxation for trichiasis correction (figure no. 6).

The progression was complicated with right eye corneal ulceration and perforation. Surgical intervention was done on the right eye with amniotic membrane transplantation at the level of the perforation aiming for anterior chamber depth reconstruction and application of the therapeutic contact lens (figure no. 7).

Particularity of the case:
Despite late presentation in an advanced stage of the disease we managed to improve visual acuity and restore ocular surface (figure no. 10).

DISCUSSIONS
Ocular pemphigus is a chronic, progressive, autoimmune disease that leads to blurry vision. The treatment does not stop disease progression but is slowing down and prevent complications. Disease has intermittent periods of exacerbations and remissions making the early diagnostic important. A study at Harvard University in Boston suggested a incidence of 1 in 8000 can develop ocular pemphigus, another study in France suggested 1,16 /1mil/annum and in Germany was 0.87/mil/annum.

REFERENCES