



“Eye Diseases: An Overview”

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ABSTRACT

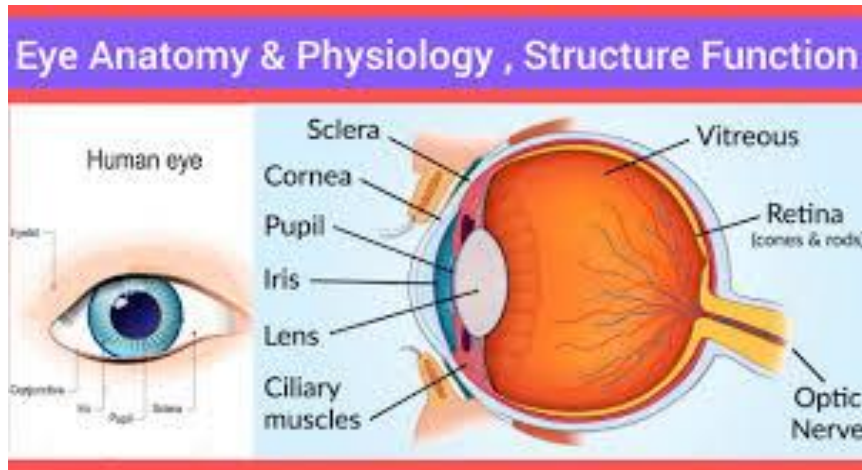
Blinds do not know the geographical, economic and cultural boundaries. There are an estimated 285 million visually impaired people worldwide, of which 39 million are visually impaired. The etiology of many eye diseases is still poorly understood. The human eye is now a new proteome that can provide important insights into the pathways of biological disease. It reviews human eye proteomics studies and presents a catalog of 4842 non-redundant proteins previously identified in human eye tissues and fluids. Use proteomics to emphasize the need to identify new biomarkers for eye disease. Recent advances in proteomics have enabled the identification of hundreds to thousands of proteins in tissues and body fluids, the characterization of various post-translational modifications, and the simultaneous quantification of multiple proteins. The Human Eye Proteome Project (HEPP) was organized in September 2012 to promote eye proteome research. This is a biological process and human illness. The vast repertoire of proteomics research tools has great potential to transform the science of vision and improve understanding of the physiology and disease processes that affect vision.

Keywords: biomarker, cornea, eye, proteomics, retina, vision

Introduction

Anatomy and Physiology of the Eye

- Eyelids: An outer structure that protects the eyeball and smoothes the surface of the eye. Each lid has a tarsal plate with a meibomian gland. The lid is joined with an inner and outer canch. The space between the two open lids is called the lid rift.
- Cornea: A transparent frontal “window” of the eye that acts as the main refracting surface.
- Sclera: Thick outer layer, usually white and opaque.
- Ring: The connection between the cornea and sclera.
- Conjunctiva: A thin vascular mucosa that lines the eyelids (conjunctiva) and sclera (eyeball conjunctiva).
- Anterior chamber: The space between the anterior cornea and the posterior iris. The chamber contains a water-like liquid called aqueous humor.
- Iris: The part of the eye color that blocks light primarily through the posterior pigment epithelium.
- Pupil: A circular opening in the center of the iris that controls the amount of light that enters the eye. Its size is determined by the parasympathetic and sympathetic innervation of the iris.
- Lens: A transparent biconvex body suspended from the pupil and the zonule behind the iris, which is part of the refraction mechanism of the eye.



- **Ciliary body:** A structure that produces aqueous humor. The contraction of the ciliary muscle changes the tension of the zonules that suspend the crystalline lens, allowing the eye to focus on distant and near objects (adjustment).
- **Posterior chamber:** A small space filled with aqueous humor behind the iris and in front of the anterior capsular bag.
- **Vitreous cavity:** A relatively large space (4.5cc) behind the lens that extends to the retina. The cavity is filled with a clear jelly-like substance called vitreous humor.
- **Nipple:** The visible part of the optic nerve. It is composed of axons whose cell body is located in the ganglion cell layer of the retina.
- **Retina:** Nervous tissue that lines the back of the vitreous cavity. The retina is essentially transparent except for the blood vessels on its inner surface, which sends the first visual signal to the brain through the optic nerve. The retina, macula, choroid, and optic disc are sometimes referred to as the retinal fundus, or simply the fundus.
- **Macula:** The area of the retina at the posterior pole of the eye that is responsible for fine central vision. The oval depression in the center of the macula is called the fovea.
- **Choroid:** A pigmented panniculus of blood vessels between the sclera and retina. The choroid supplies blood to the outer layer of the retina.
- **External eye muscles:** medial (medial straight), lateral (lateral straight), superior (upper and lower oblique muscles), downward (lower and superior oblique muscles), and twisted (upper oblique) of the eyeball. Six muscles that control the muscles and inferior oblique muscles) movement). These muscles are supplied by three cranial nerves. Cranial nerve IV that innervates the superior oblique muscle. Cranial nerves that control the lateral rectus muscle VI; Cranial nerves that control the remaining extraocular muscles III.

Eye Disease

Lid / orbit b



fig.1. blepharitis

Blepharitis: Chronic inflammation of the eyelid margin.

1. Sx / sx Lid / orbit

A. Blepharitis: Chronic inflammation of the eyelid margin

1. Sx / sx

a. combustion

b. Foreign body sensation

c. The edge of the red lid with crustal formation in short The lid often sticks in the morning.

e. Possibility of eyelash loss

2. Second Treatment

Loosen the crust with a warm compress

Blepharitis

- b. Proper eyelid hygiene, clean the eyelids thoroughly with a washcloth and lukewarm water, and use non-irritating feces in the morning and evening.
- c. Topical antibiotic eye ointment h.s. x 2-3 weeks (bacitracin, erythromycin)
in short Topical ophthalmic antibiotic solution in the presence of associated conjunctivitis (10% sulfacetamide or gentamicin Q.I. x 5-7 days).
- e. Oral antibiotics (doxycycline) only in refractory cases
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Dry Eye

- 1. Tear deficiency ("Dry keratitis")
 - a. Burning sensation, "rough" sensation (symptoms exceed signs)
 - b. process
 - (1) Frequently injected artificial tears
 - (2) Lubricating eye ointment h.s.
 - (3) Sunglasses to be worn outdoors
 - c. Common with aging and post menopausal women
 - d. Associated conditions
 - (1) Rheumatoid arthritis, Stevens-Johnson syndrome, systemic meds (diuretics, antihistamines, antidepressants, dermatologic drying agents)
 - (2) If severe, refer to an ophthalmologist

Pingueculum/Pterygium

- 1. Pathologic tissue change caused by exposure to sun, wind, dust, dryness
- 2. Arises from bulbar conjunctiva at palpebral fissure (nasal and/or temporal)
- 3. Pingueculum: confined to conjunctival tissue
- 4. Pterygium: Expansion to tire cornea Pterygium
- 5. Responds to environmental stimulants (smoke, smoke, etc.), becomes red and inflamed, and attracts attention
- 6. Treatment
 - a) Frequent use of artificial tears
 - b) Outdoor sunglasses
 - c) Local vasoconstrictors temporarily relieve redness. Note: Frequent use causes chronic redness. That is, if the actively growing pterygium progresses to the dilated edge of the pupil, or if the inflammation is severe, consult an ophthalmologist.

Angle-closure glaucoma

1.Sx / sx: Severe eye pain, headache, nausea and vomiting, iris halo perception, blurred or smoky vision

Second sign: redness of cilia (purple shade around the annulus), corneal annulus

Edema, flat anterior chamber, medium pupil, high intraocular pressure. 3.3. Treatment. Angle-closure glaucoma

Medical treatment is initially used to interrupt acute attacks, paving the way for definitive surgical treatment.

- a) Instill a local beta blocker, 1 drop of timolol 0.5% and pilocarpine 1. % -2% every 15 minutes x 3
- b) Administer acetazolamide 250 mg. Administer PO (avoid if you are allergic to sulfa drugs) and systemic penetration (glycerol PO). Avoid this drug for patients with congestive heart failure
- c) Administer systemic analgesics. d) Immediate referral to an ophthalmologist for laser or surgical treatment

IRIS IRITIS / UVEITIS

1. Sx / sx: Moderate pain, photophobia, vision loss, pericorneal injection, ciliary redness, pupil contraction, normal to low IOP.

2nd + - Associated condition: inflammation, rheumatoid arthritis, sarcoidosis, dental abscesses, urethritis, inflammatory bowel disorders, syphilis, toxoplasmosis, tuberculosis.

Treatment:

Dilate the pupil with atropine 1%; Semi-urgent referral within one week

lens Cataract

1. Sx / sx: Painless, gradual loss of vision in the distance or near, glare, severe vision loss in bright sunlight or due to headlights of oncoming vehicles at night.

Second character: Dull red reflections, dark central opacity, or white pupils when the lens is completely opaque. Myopic shift in refractive error - reading glasses no longer required but distance vision is poor

Management - surgery

Refer if a patient loses ability to function in usual capacity.

Important: Not to assign visual loss to cataract before ensuring that other more serious causes of visual loss have not been overlooked (i.e. Detached retina clouded cornea, macular degeneration, glaucoma, vitreous hemorrhage).

Fundus optic nerve

Open-angle glaucoma

- 1) Sx / sx: Visual acuity gradually declines and peripheral vision gradually declines. Second character:
 - a. Increased intraocular pressure
 - b. Glaucoma optic nerve damage cupping
- 2) Eyecup diameter that is more than half the diameter of the disc
- 3) Cup: Disc asymmetry is greater than 0.1

Central Retinal Vein Occlusion (CRVO) And Branch Retinal Vein Occlusion (Brvo)

1. Sx/sx: Subacute loss of vision
2. Signs: Disc swelling, venous engorgement, small white patches on the retina (cotton wool spots) diffuse retinal hemorrhages in CRVO and hemorrhages along the distribution of the involved vein in BRVO.
3. Associated conditions: Hypertension, diabetes, glaucoma, vasculitis.

Chemical burns on the eyes

Eye burns are one of the few true eye emergencies. Start washing your eyes immediately, even before completing your medical history or measuring your eyesight. Acid burns cause denaturation of tissue proteins that act as a barrier to prevent further diffusion. For this reason, it is generally less devastating than alkaline burns, but it can still be very severe. Alkaline burns do not cause denaturation of tissue proteins. As a result, corrosive alkaline chemicals tend to penetrate deeper than acid burns and generally tend to destroy eye tissue. They can cause corneal melting, conjunctival bleaching, severe corneal scarring, and intraocular complications such as uveitis and secondary glaucoma. Clinical findings of both types of mild burns include conjunctival hyperemia, chemosis and corneal erosion, and slight opacity. More severe cases indicate corneal opacity and annulus ischemia.

Treatment

The most important step in the treatment of acute chemical burns is an immediate, massive wash of all exposed tissue for at least 30 minutes.

Irrigating the Eye

1. Immediately upon arrival, ask the patient to lie down on a stretcher, sofa, examining table, or a chair with a tilted back.
2. If the ophthalmologist requires and permits and if the patient has no known allergy to anesthetic medication, instill one drop of topical anesthetic solution
3. Holding a gauze pad to help you keep your grasp, use your gloved fingers to separate the lids of the affected eye. Keep the lid gently but tightly open to combat cramps and strong eye closure during the flush. You can also use the closure speculum to keep the closure open.
4. Give the patient a towel to hold the face down to absorb excess water. In addition, a basin can be placed next to the patient's face to collect the liquid.

5. Rinse with a bottle of ready-made equilibrium salt solution. If not, use an available water source. If possible, a continuous quick drip bottle (hanging like an IV) is easier because you don't have to squeeze the bottle further. Just point the beam at the patient's eyes. Keep the jet of irrigation away from your nose to avoid contaminating other eyes.
6. You may need to evert (turn out) the upper lid while irrigating to wash away particles of chemical that may have become lodged there. To evert the lid :
 - a. With the thumb and forefinger of one gloved hand, grasp the lashes of the upper lid and pull it out and down slightly .
 - b. Using your other hand, place the stick portion of a cotton-tipped applicator horizontally on the upper eyelid, approximately ½ inch above the margin of the eyelid .
 - c. Rotate the cap up and place it on the applicator stick to expose the surface of the conjunctiva.

Rotate the lid up to expose the surface of the conjunctiva on the applicator stick.

After rinsing, carefully examine the eyes, apply a local anesthetic, turn the lid over and wipe with a damp cotton swab to remove blisters that may have an alkaline pH inside. Check for epithelial defects, corneal melting, and other damage. Administer topical cycloprednisolone, antibiotics, and corticosteroid drops, then bandage the eyes and refer the treatment protocol to an ophthalmologist.

Acute Angle-Occlusion Glaucoma

Aqueous humor usually flows from posterior to anterior. The anterior chamber enters the anterior chamber through the pupil and then flows back into the venous circulation through the trabecular meshwork. Acute angle-closure glaucoma occurs when the iris opposes the trabecular meshwork and blocks the outflow of aqueous humor. The predisposition is a small, hyperopic eye and a narrow chamber angle. Pupil block results in accumulation of aqueous humor behind the iris, anteflexion of the iris, closure of the anterior chamber angle, and a sharp increase in intraocular pressure. Pupil block is more likely to occur if the pupil is moderately dilated. Therefore, seizures can be caused by topical mydriatics, systemic anticholinergic agents, stress, agitation, or dim lighting. Due to a sharp rise in intraocular pressure, patients may experience headaches, severe eye pain, nausea, and vomiting. There is an injection into the eye and the cornea may be vaporized due to epithelial edema. This causes the patient to see a rainbow-colored halo around the light, blurring their vision and producing a rainbow-like effect. On examination, the patient shows high intraocular pressure and redness of the ciliary body (a shade of purple around the annulus). The pupil is moderately dilated and blunt. Anterior chamber is flat.

Treatment

Medical treatment is initially used to interrupt an acute attack and pave the way for definitive surgical treatment.

1. Inject 1 drop of timolol 0.5% local beta blocker
2. Inject 1% to 2% q.s. of pilocarpine. 15 minutes x 3
3. Administer acetazolamide 250 mg. PO
!! Avoid if you are allergic to sulfa drugs.
4. Management of systemic penetration (glycerol PO)
!! Avoid this drug for patients with congestive heart failure
5. Administer systemic analgesics.
6. Immediate referral to an ophthalmologist for laser or surgical treatment.

!! Eye Trauma

Trauma to the eye or adjacent structures requires careful evaluation to determine the degree of injury. Foreign bodies in the conjunctiva and cornea are the most common eye injuries, but foreign bodies in the eye also occur. The intraocular pressure is not recognized, or if the second infection follows a corneal injury, seeking mild trauma can be serious. Trauma that destroys, penetrates, or can destroy the eyeball constitutes an emergency. Some torn eyes may look normal, so if you have an abnormal history, you should maintain a high suspicion indicator. Symptoms and signs of eye perforation include marked loss of vision, flatness or shallowness of the anterior chamber, changes in pupil size, shape, or position, excessive chemosis (clear subconjunctival fluid) or subconjunctival hemorrhage. , And a total (or large) dash.

Points to remember

- Do not do the following while examining a patient who may have a ruptured eye.
- Eyelid operation
- Run a motility test (to avoid pushing out the contents of the eye)
- Pressure on Earth during examination- (Measurement of intraocular pressure)
- Do not dilate the pupils of patients with head trauma (papillary signs may be important for neurological assessment) and patients with a shallow anterior chamber. -As a preliminary measure, the shield should be taped over the eyes to protect the eyes from friction, pressure, and further damage prior to treatment by an ophthalmologist. Signs can be made from perforated malleable metal pieces, plastic pieces, or paper cups cut to size. Neither patches nor ointments are recommended. -Patients should avoid eating or drinking anything in anticipation of surgical intervention.

How to Keep the Healthy Eyes Through Out the Life Span

Eye examination for children 2-3 years old. An eye examination (or covering) of a child performed by the mother. Talk to your doctor about the difference between strabismus eyes and signs. Wear safety goggles when working with harsh chemicals and when performing dangerous tasks that can lead to eye injury. Wear sunglasses to protect your eyes from harmful sunlight. Regular eye examinations for people under the age of 40 with a family history of glaucoma or other eye diseases. Regular annual ophthalmology examinations by an ophthalmologist for diabetics. Controlling blood pressure and blood sugar levels helps prevent future eye complications. Flashing lights and floating spots in front of you can be the first signs of retinal detachment, especially for high myopia that requires urgent referral.

References

1. Mathew L. Lanternier. Family Practice Handbook. Ch. 19 Ophthalmology. Fourth Edition. University of Iowa. 2001.
2. The Merck Manual of Diagnosis and Therapy. Section 8: Ophthalmologic Disorders. 2004.
3. Cynthia A. Bradford. Basic Ophthalmology. Eighth Edition. 2004.
4. Tyree Carr. Ophthalmic Medical Assisting. Third Edition. 1999.
5. Jonathan D. Trobe. The Physician's Guide to Eye Care. Second Edition. 2001.
6. Alis Özçakir. Approach to Eye Diseases in Primary Care. 1999.
7. Basic and Clinical Science Course. American Academy of Ophthalmology. 2003-2004.
8. Daniel H. Gold, Richard Alan Lewis. Clinical Eye Atlas. 2002.
9. Fred M. Wilson II. Practical Ophthalmology. Fourth Edition. 1996.
10. George M. Bohigian, Shailaja Valluri. Ocular Infections, Inflammation and External Diseases. 2000.
11. Rohit Varma. Essentials of Eye Care. 1997.
12. Michael P. Vrabec, George J. Florakis. Ophthalmic Essentials. 1992.
13. Managing the Red Eye. A slide-script program. American Academy of Ophthalmology. 1991.
14. Eye Trauma and Emergencies. A slide-script program. American Academy of Ophthalmology. 1996.
15. Diabetes and Eye Diseases. A slide-script program. American Academy of Ophthalmology. 2001.
16. Eye Care Skills on CD-Rom. American Academy of Ophthalmology. 2001.
17. Eye Exam. The Essentials. American Academy of Ophthalmology. 2004.