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REPRESENTATIVE EYE DISEASES AND THEIR PREVALENCE IN SAUDI ARABIA

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Review Article

ABSTRACT

Many patients with symptomatic eye conditions present initially to their primary care physician. Eye issues account for 2-3% of all primary care office visits. Knowing how to respond when these patients come is critical for the family physician, as is knowing when to refer them to an ophthalmologist for additional care. Family doctors should be able to spot eye disorders that can cause vision loss and necessitate an immediate referral to an ophthalmologist. A comprehensive history and physical examination are essential in reaching a diagnosis and determining the severity of the eye problem. Visual changes, length of symptoms, presence or absence of a foreign body, history of trauma or recent eye surgery, and concomitant symptoms such as a headache, nausea, or ocular discharge should all be addressed in the history. Almost 50% of all eye disorders presented to a family physician. Comprehensive treatment of such conditions can often be provided in the primary care setting. Patients with persistent or severe conditions, particularly those involving foreign bodies and corneal abrasions due to high-velocity injuries, should be referred for immediate care by an ophthalmologist. This review aims to review most prevalent eye complaints in primary health care centers in Saudi Arabia.

Keywords: Primary care; family physician; ophthalmic diseases; eye complaints; cataract; retinopathy.

1. INTRODUCTION

"Eye diseases are known to adversely affect quality of life. Geographical location, accessibility to facilities and socio- economic status of an individual play a role in occurrence eye diseases" [1]. "According to international classification of diseases established by the World Health organization (WHO) the vision of patients was categorized into: no visual impairment, visual impairment, severe visual impairment, and blindness. Eye diseases are an important cause of permanent loss of vision. A large number of people living in different parts of the world suffer from visual impairment. An estimated 285 million people around the world are visually impaired" [2]. "Of this, 19 million are children below the age of 14 years. More than 60% of cases of blindness among infants are caused by inherited eye diseases. Children should receive proper screening and treatment of their eye disease to prevent loss of vision in the long term. Strategies to improve visual acuity screening and providing education on the importance of timely follow-up for eye care are important to avoid vision problems and eye morbidities" [3].

2. CLASSIFICATION AND PREVALENCE

The four most common eye conditions leading to loss of vision or blindness in Saudi Arabia and worldwide are:

- Cataracts.
- Diabetes-related retinopathy.
- Glaucoma.
- Age-related macular degeneration.

However, there are hundreds of different eye diseases and disorders [4].

Eye conditions commonly seen in Saudi children include:

- Amblyopia also called "lazy eye" .This is the most common cause of vision impairment in children.
- Strabismus is a lack of coordination between both eyes, which causes them to cross or turn out.
- Conjunctivitis also known as pink eye, is an inflammation of the conjunctiva. Pink eye can be highly contagious, especially among children. Although it doesn't damage vision, it causes itchy, red, blurry, tearing and discharge [5].

3. CATARACT

"Cataract is a clouding of the eye's lens and is the leading cause of blindness worldwide, and the leading cause of vision loss in the United States. Cataracts can occur at any age because of a variety of causes, and can be present at birth. Although treatment for the removal of cataract is widely available, access barriers such as insurance coverage, treatment costs, patient choice, or lack of awareness prevent many people from receiving the proper treatment" [6].

"An estimated 20.5 million (17.2%) Americans aged 40 years and older have cataract in one or both eyes, and 6.1 million (5.1%) have had their lens removed operatively. The total number of people who have

cataracts is estimated to increase to 30.1 million by 2020" [7]. Few studies have been conducted in Saudi Arabia to estimate the prevalence of visual impairment and its causes, it was found that the main medical causes of visual impairments were refractive errors (36.0%) followed by cataract (29.1%) and diabetic retinopathy (28.9%)

4. AGE-RELATED MACULAR DEGENERATION

"AMD is a common, chronic, progressive degenerative disorder of the macula that affects older individuals and features loss of central vision as a result of abnormalities in the photoreceptor/retinal pigment epithelium/Bruch's membrane/choroidal complex often result in geographic atrophy and/or neovascularization". [8]. "Advanced AMD can be classified broadly into two types: dry and wet. Although dry AMD accounts for the majority of all diagnosed cases, wet AMD is responsible for the majority of the severe vision loss and it usually occurs over weeks to months. Although neovascularization has been the most common cause of severe vision loss, geographic atrophy, the most advanced form of dry AMD, can cause a significant loss of vision as well" [9].

"Globally, AMD ranks third as a cause of blindness after cataract and glaucoma. In Saudi Arabia, AMD represents 3.3**%** of the major causes of blindness in individuals older than 50 years. Most of the affected individuals live in developed countries. In general, advanced AMD is rare before the age of 55, and more common in persons of 75 years and older" [10].

5. GLAUCOMAS

"Glaucomas are a group of optic neuropathies characterized by progressive degeneration of retinal ganglion cells. These are central nervous system neurons that have their cell bodies in the inner retina and axons in the optic nerve" [11]. "Degeneration of these nerves results in cupping, a characteristic appearance of the optic disc and visual loss. The biological basis of glaucoma is poorly understood and the factors contributing to its progression have not been fully characterized" [12].

"Glaucoma affects more than 70 million people worldwide with approximately 10% being bilaterally blind, making it the leading cause of irreversible blindness in the world. In a primary health center (PHC) based study reported found 5.8**%** prevalence of glaucoma in northern Saudi Arabia. Glaucoma can remain asymptomatic until it is severe, resulting in a high likelihood that the number of affected individuals is much higher than the number known to have it" [13].

6. DIABETIC RETINOPATHY (DR)

"(DR) is a major complication of diabetes mellitus (DM), which remains a leading cause of visual loss in working-age populations. The diagnosis of DR is made by clinical manifestations of vascular abnormalities in the retina" [14]. "Clinically, DR is divided into two stages: non-proliferative diabetic retinopathy (NPDR) and proliferative diabetic retinopathy (PDR). NPDR represents the early stage of DR, wherein increased vascular permeability and capillary occlusion are two main observations in the retinal vasculature" [15]. "During this stage, retinal pathologies including micro aneurysms, hemorrhages and hard exudates can be detected by fundus photography although the patients may be asymptomatic. PDR, a more advanced stage of DR, is characterized by neovascularization. During this stage, the patients may experience severe vision impairment when the new abnormal vessels bleed into the vitreous (vitreous hemorrhage) or when tractional retinal detachment is present. The most common cause of vision loss in patients with DR is diabetic macular edema (DME)" [16].

It was reported that the overall prevalence of diabetic retinopathy in Saudi Arabia ranges between 33% and 36% according to the region of study.

7. AMBLYOPIA

"Amblyopia is a disorder of the development of sight. It is due to the failure of cortical visual development in one or both eyes from ocular pathology early in life. Often, amblyopia is referred to as a "lazy eye" by the general public" [17]. "Amblyopia is commonly associated with squint (strabismus) or refractive errors resulting in different visual inputs to each eye during the sensitive period of visual development (<7-8 years of age). The cumulative incidence is estimated at 2% to 4% in children aged up to 15 years" [18] The pooled prevalence of amblyopia among children of Saudi Arabia is approximately 2.3%.

8. STRABISMUS

"Strabismus is a manifest deviation of the eyes that exceeds the control of the fusional mechanism so that the eyes are misaligned under binocular condition" [19] "The condition of the deviation could either constant or intermittent based on the fusional status and the deviation could also either turned in esotropia (ET), out or exotropia (XT), down or hypotropia, up or hypertropia, rotated in (incyclotropia), and rotated

out (excyclotropia). Horizontal deviation (XT, ET) is the most common type presented clinically worldwide" [20].

"The pooled prevalence of any strabismus, exotropia, and esotropia was 1.93%, 1.23%, and 0.77%, respectively, globally and in Ethiopia, its prevalence ranges from 1.53% to 17.9%. The prevalence of squint in Saudi Arabia is increasing. A recent study conducted in 2018 in Arar, Northern Saudi Arabia, reported strabismus in 14.7% of the studied sample. A study conducted in Hail city, Saudi Arabia, showed that the prevalence of squint among 299 participants was 17.1%; however, the prevalence of squint is usually underestimated, often due to lack of awareness and detection. Family history, ethnicity, genetic conditions, smoking, prematurity, low birth weight, refractive error, and neuro disability are the most common risk factors associated with the development of strabismus" [21].

9. CONJUNCTIVITIS

"Conjunctivitis is characterized by inflammation and swelling of the conjunctival tissue, accompanied by engorgement of the blood vessels, ocular discharge, and pain. Many subjects are affected with conjunctivitis worldwide, and it is one of the most frequent reasons for office visits to general medical and ophthalmology clinics. More than 80% of all acute cases of conjunctivitis are reported to be diagnosed by non-ophthalmologists including internists, family medicine physicians, pediatricians, and nurse practitioners, it accounts for up to 1% of all primary care office visits" [22]. The age-sex-adjusted prevalence of allergic conjunctivitis AC was 70.5% (95% confidence interval [CI] 68.6–72.4). There could be 2.1 million AC patients among 3.1 million adult populations in Western KSA. It was significantly higher in females compared to males.

10. COMPREHENSIVE EYE EXAMINATION CEE

"A routine comprehensive eye examination helps to screen for and diagnose common eye diseases. A CEE consists of a series of tests that assess the different aspects of eye health. Ideally, a CEE should be done not just for patients seeking medical advice but also for individuals above the age of 40 as a yearly check-up. A detailed medical and treatment history is essential before beginning a CEE" [23].

Multiple examination tests are done which include:

"Visual acuity (VA) is a measure of the eye's ability to distinguish shapes and the details of objects at a given distance. Any reduction in VA can show an underlying pathology. Write the results of the VA test as a fraction. In young children, use Tellers and Cardiff acuity cards or optokinetic nystagmus. Measure the presenting and corrected near visual acuity with hand-held test cards by placing them at a distance of 40 cm" [24].

Visual field can be tested using a simple procedure known as confrontation test. A confrontation test checks the peripheral and central visual fields (VF) and is the most used VF test done during a CEE. Each eye is tested for all four quadrants (upper and lower, temporal and nasal). Perimetry tests are used for a more detailed and systematic evaluation of VF. Amsler grid is a useful tool for macular disorders with central field defect (age-related macular degeneration) [25]. Testing the visual field is useful in the management of patients with glaucoma, neuro-ophthalmic and retinal disorders.

Contrast sensitivity is the measure of the eye's ability to detect an object against its background. A Pelli Robson chart is used to test for contrast sensitivity. The Pelli Robson chart consists of horizontal lines of capital letters in contrast of one colour. Glaucoma, diabetic eye disease, and cataracts have shown to reduce contrast sensitivity in patients.

"Binocular vision is the vision achieved by the coordinated use of both eyes together. Simultaneous perception, fusion, and stereopsis are the three grades of binocular vision. Binocular vision can be tested using Bagolini's striated glasses, worth four dot test and red filter test" [26].

Intraocular pressure: Tonometry is used to measure intraocular pressures (IOP) and to evaluate patients with or at risk of glaucoma.

Detailed fundus examination: "Direct ophthalmoscopy provides an upright and monocular image of the retina. It is very useful for examining optic disc changes and foveal pathologies at higher magnification. A dilated fundus examination helps to rule out diseases like diabetic retinopathy (DR) which have a high prevalence. Non-mydriatic fundus cameras are also available for peripheral centre-based screening of DR" [27].

"Colour vision deficiency is the inability to distinguish between certain shades of color. It is a genetic disorder more common in men. Red-green deficiency is most common. Conditions like diabetes, glaucoma, optic neuritis and use of certain drugs (chlorpromazine, thioridazine, and ethambutol) may lead to color vision deficiencies. Many patients are

unaware of their deficiency unless tested" [28]. We recommend use of color vision charts for screening and detecting specific types of color blindness.

Refraction is a test that determines the type (myopia, hypermetropia, and astigmatism) and the amount of refractive error (RE). It also tells us the required lens power needed to compensate for it.

After a CEE, consider the results of the examination to determine a diagnosis. Sometimes more investigation may be needed to confirm or rule out the suspected diagnosis and to develop a treatment plan. Make appropriate referrals if the patient needs specialist consultations.

"Each primary eye care worker should be an effective educator and have good communication skills, and increase awareness of eye health by talking to village leaders, community administrative authorities, school teachers, pupils and individual households" [29].

Each eye care worker should have medicines and basic equipment such as:

Medicines: Tetracycline 1% eye ointment, Chloramphenicol 0.5% eye drops, Zinc sulphate 0.2% eye drops, Vitamin A capsules, Silver nitrate 1% eye drops.

Basic equipment: Snellen E chart, Hand magnifying lens, Torch and batteries, Epilation forceps (in trachoma endemic areas), Dressings: eye pads, bandages, sticking plaster, eye shields.

"A primary eye care worker should be able to treat certain conditions, treat and refer particular eye problems or refer patients directly for appropriate secondary or tertiary specialist care" [30].

11. DISCUSSION

Therefore, primary eye care encompasses a wide range of procedures that can be carried out at the main level of medical care or in the community. In all societies and locations around the world, primary eye care is the fundamental cornerstone of the fight against blindness. Without basic eye care, only those patients who visit intermediate and tertiary clinics would receive diagnoses and treatments, and little will be done to prevent vision loss. There may be participation from a variety of worker cadres, many of whom have a wide range of obligations. This is one of the problems and difficulties that must be overcome for primary healthcare to be implemented successfully and comprehensively [31].

In order for these cadres to function as integrated primary eye care providers, it is also necessary to take into account their training needs. Effective primary eye care cannot be provided in isolation. It is crucial that there is clear communication and efficient referral mechanisms to secondary and tertiary eye care centres, where there are resources and staff members who have received further training in the management of ocular disorders [17,31].

The ophthalmic profession is in charge of defining the clinical specifics of this phase and directing ocular primary care training, research, and planning in their direction. This instantly outlines an important role for ophthalmology [32].

It is necessary to start a number of concurrent discussions that will interact with one another and work toward a shared agenda. These discussions should cover the following topics: (1) clinical issues; (2) primary care models; and (3) workforce. While some of these discussions have already begun in the literature, others still need to be focused, intense, committed, and held in a number of forums [32].

12. CONCLUSION

Even while clinical ophthalmology sits at the core of its services and has a wealth of pertinent ophthalmic experience, the structured discipline of ocular primary care is still in its infancy and continues to borrow identity from other specialties. This may be due to the lack of glamour in a very technical and medically focused profession, but ophthalmic primary care is a rich and gratifying area that needs to be acknowledged by the field's top authorities.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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