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ANALYZING THE PREVALENCE OF CHRONIC DISEASE OF EYE

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ABSTRACT

The prevalence of visual impairment (VI) is increasing, making it a new issue in public health policy. Contrasted with other major chronic illnesses, however, VI is generally disregarded by researchers calculating disease burden. The eye is vulnerable to a wide range of injuries from long-term exposure to harmful contaminants in the environment. There are communities where the difficulties associated with vision impairment (VI) are more commonly disregarded than those associated with other health problems. Opacification of the crystalline lens inside the eye is the medical definition of cataract. Age-related macular degeneration is the leading cause of blindness in Australia, responsible for more than half of all cases (ARMD). The loss of peripheral vision due to glaucoma, together with the presence of optic disk abnormalities, was used as a diagnostic criterion for glaucoma.

KEYWORDSeye Disease, visual loss, ARMD,Visual impairment

INTRODUCTION

The human eye, like the skin, is continually exposed to the elements; as a result, the eyes are just as delicate and susceptible to the negative effects of a variety of environmental contaminants as the skin is. Tissues with greater fragility, such as the retina, are located farther back in the eye. The eye is very sensitive to changes in light and air pressure, and as a result, its functions are largely contingent on the state of its surrounding environment. The ability to see in color and in three dimensions during daylight hours is the eye's primary purpose. It can't do its job well if it's not in an optimal setting. Long-term exposure to harmful chemicals in the environment, including those in the air, water, and soil, may cause a variety of problems for the eyes. While VI is more typically ignored than other health disorders, it nonetheless has a significant impact on specific communities. Yet, as the global population ages over the last two decades, the number of people with VI has skyrocketed. This poses a significant public health burden. Maybe more meaningful than death and disability rates are measures of quality of life for those with visual problems (ie, disability-adjusted life-years). The quality-adjusted life-year (QALY) is a measure of health-related efficacy that takes into account an individual's subjective assessment of the worth of their remaining years of life notwithstanding their current health status (year). Estimates of quality-adjusted life years are derived from utilities, which are based on individual preferences and have a continuous scale from perfect health (1.0) to death (0).

LITERATURE REVIEW

Matteo Ripa et.al (2022) Reduced visual acuity and even "visual loss" have been described as an unusual symptom of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection in individuals. The purpose of this meta-analysis is to examine the existing data about "visual loss" induced by SARS-CoV-2 infection and to calculate the cumulative incidence of "visual loss" during coronavirus disease 2019 (COVID-19). Following the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses, we conducted a comprehensive literature review and meta-analysis. To find research that directly addressed the relationship between "vision loss" and SARS-CoV-2 infection, we combed through PubMed, Embase, and Scopus. Inclusion criteria included reports of "vision loss" and laboratory-confirmed SARS-CoV-2 infection in humans. Using a risk assessment and a 95% confidence interval, meta-analyses were performed on the individual studies. As a result of our search, we found 1,143 manuscripts written in English. Two cross-sectional studies, twenty-four case reports, and three case series were chosen from the original pool of research. The cumulative incidence of "visual loss" among COVID-19 patients was 0.16 (95% CI 0.12-0.21) according to a random-effect meta-analysis. On general, the quality of the cross-sectional studies was deemed to be a moderate four on the Newcastle-Ottawa scale. Infection with the COVID-19 strain may result in "visual loss," the authors conclude. Patients with SARS-CoV-2 infection who report visual impairment should be evaluated by an ophthalmologist as soon as possible, regardless of the quality of the available evidence.

AzadehTavakoli et.al (2021) From the middle of the twentieth century forward, a noticeable increase in chronic illness has been seen, and this trend is increasingly being recognized as an epidemic, with the potential to completely overwhelm public health systems in many nations. Although having all the symptoms of a chronic condition, dry eye disease receives little attention. The goal of preventive medicine is to slow the development of chronic diseases by encouraging patients to take an active role in their own healthcare. Successful preventive health methods may face direct or indirect risks from anthropogenic surroundings that promote unhealthy lifestyles and behaviors. The contemporary environment has triggered physiological reactions in the human body that might be seen as the cause of chronic illness. Ironically, the improvements in health and quality of life seen over the last century are in danger of being rolled back by our pursuit of a more convenient, global, and disease-free way of life. This review looks at the role that diet (what people put into their bodies) and nutrition (which includes one's connections to one's self, one's community, and one's environment) play in the etiology and progression of dry eye disease, which is considered an anthropogenic chronic illness. The production, distribution, and storage of food are highlighted as potential environmental and behavioral triggers of chronic diseases. Furthermore, the evidence of traditional eating practices that give resistance to the development of chronic systemic inflammatory illnesses is examined as an example of prospective methods that may be used by people and groups to reestablish a balanced life, community, and planet.

Michael C Okosa (2021) The purpose of this study is to better understand the mental health of ophthalmic patients who are treated at a tertiary eye hospital and to provide information that may be used to improve the quality of treatment these patients receive. Techniques and Materials: Using a pretested interviewer-administered, semi-structured questionnaire, this research provides a cross-sectional descriptive profile of ophthalmic patients at a tertiary eye center. Data collected

included demographics, eye-health literacy, anxiety about vision loss, emotional response to present ocular illness, and quality-of-life impact. The eyes were examined thoroughly. The collected data was analyzed using SPSS version 23 (Statistical Program for the Social Sciences). We questioned and assessed 243 patients and got those numbers. There were 132 women (54.3%) and 111 men (45.7%). From 16 to 90 years old (with a mean age of 44.2 18.1) were represented. The most prevalent presenting symptoms were problems with vision (127, or 52.3%), pain or discomfort in the eyes (113, or 46.5%), and ocular surface disease (83, or 34.2%), and ametropia (55, or 22.6%). The visual acuity of forty patients (16.5%) was below 3/60. Most people were worried about losing their eyesight (103 people, or 42.4%), the long-term effects of their existing eye ailment (47 people, or 19.3%), and the expense of treatment (24 people, or 9.9%). Blindness (P=0.005) and particular diagnoses like cataract and glaucoma (P0.001) were substantially related with preexisting fears of sickness. Anxiety was reported by 112 respondents (46.1%), despair by 63 (25.9%), wrath towards God or someone by 21 (8.6%), and a lack of feeling by 47 (19.3%) in response to their eye ailment. No one seemed relieved that their eye condition had finally shown. One-third of the patients had sleeplessness, anorexia, and difficulty concentrating as a result of these emotional responses. Depression, anxiety, and irritability were all substantially linked to a family history of blindness (P=0.013). The conclusion is that there is a strong correlation between anxiety and depression and eye problems. This concerns your vision problems right now and in the future. It is crucial that eye care providers be aware of these in order to provide the necessary mental health support and care to these patients in conjunction with and referrals to mental health experts.

Alexa L. Li et.al (2020) This research aimed to characterize ocular findings, structural ocular problems, and visual impairment in a group of Lassa fever survivors in Kenema, Sierra Leone. We conducted a retrospective, uncontrolled, cross-sectional research of ocular outcomes in January 2018 at the Kenema Government Hospital in Kenema, Sierra Leone, among 31 people who survived Lassa fever and had 62 eyes examined. Patients' demographics, ocular and general health complaints, visual acuity (VA), and the results of an eye examination were all recorded. The severity of visual impairment and the presence or absence of anterior and posterior segment ocular symptoms were the primary endpoints for patients who survived Lassa fever. Cataracts and pterygiums were found in the anterior section, whereas glaucoma, preretinal hemorrhage, and lattice degeneration were found in the posterior segment. Retinal fibrosis (3%), vitreous opacity (2%) and chorioretinal scarring (5%) were found, all of which are possible long-term effects of uveitis. Under WHO standards, 53 eyes (85%) had normal or minimally impaired vision, 6 eyes (10%) had impaired vision, and 3 eyes (5%). Ophthalmic disease signs (p0.0001) and posterior segment disease (p0.0001) both resulted in significantly worse median visual acuity in Lassa fever survivors. Cataracts, if left untreated, significantly reduced visual acuity (p0.0001). Cataracts and other posterior segment abnormalities were seen in this cohort of Lassa fever survivors, which may suggest residual vision impairment from the uveitis. The scope of ocular illness in this developing viral disease of public health concern requires more research.

Sang Jun Park et.al (2016) Importance In light of the aging of the population, visual impairment (VI) has emerged as a pressing issue in public health. Although though VI is a prominent chronic disease, researchers tasked with determining the burden of illness generally neglect it. Objectives In order to evaluate the burden of VI and other chronic illnesses, it is necessary to describe the preference weights that respondents to a nationwide survey assigned to each of these conditions. Structure, Context, and Subjects In order to get estimates that are

typical of the whole country, researchers used a multistage probability-cluster survey for their cross-sectional study. During 2008-2012, researchers examined data on 29,639 adults who took part in the Korean National Health and Nutrition Examination Survey in terms of eye testing, chronic illness status, and the European Quality of Life-Five Dimensions Questionnaire (EQ-5D). Those who had a best-corrected visual acuity at 20 feet or farther had been classified as having impaired vision. The time period covered by this data study is from August 14, 2008 to September 7, 2015. Core Metrics and Results Quality-adjusted life-year (QALY) losses and preference weights (utilities) depending on disease prevalence. Results There were a total of 29,639 participants, but only 28,382 had VA or EQ-5D measures, and these individuals had a mean (SE) age of 45.05 (0.19) and an EQ-5D score of 0.948. (0.001). Preference weight for VI was 0.0549 (95% confidence interval [CI], 0.0777 to 0.0321), ranking it third highest among the 12 conditions studied, behind only preference weights for osteoarthritis or rheumatoid arthritis (0.0688; 95% CI, 0.748 to 0.0628) and stroke (0.0666; 95% CI, 0.0854 to 0.0479). As compared to the QALY loss related with other major chronic disorders (such as diabetes mellitus, dyslipidemia, stroke, myocardial infarction/ischemic heart disease, asthma, obesity, and anemia), the yearly QALY loss from VI was 74.93 years per 100 000 person-years. Around 4.77 percent of the predicted QALY loss among the 19-and-up Korean population was attributable to impaired vision. Consensus and Implications Data from a nationwide survey were used to characterize respondents' preference weights for VI and other chronic conditions. Public burden from these problems is also shown and contrasted in terms of where they are felt. Although specifics may vary between communities with varying cultural and socioeconomic backgrounds, the findings highlight the public health burden of VI and its impact on individuals' quality of life.

CATARACT

Opacification of the crystalline lens within the eye is the medical definition of cataract. Cataract incidence increases steadily after age 65, peaking at about 25% in people over 85 years old. The majority of people who need surgery on their eyes have cataracts removed.Visual symptoms associated with cataract include blurred vision, glare (particularly near lights at night), and/or monocular diplopia (double vision in one eye) (Figure 1). Cataracts may be broken down into two main groups: primary (congenital and age-related) and secondary (caused by trauma, medication use such as corticosteroids, and systemic disorders such as diabetes mellitus, irradiation and ocular inflammation).

Figure 1. A patient’s view through a moderate cataract. Colours are faded and adopt a yellow-brown hue. There is loss of contrast and acuity

Both the Lens Opacities Classification System and the Oxford Clinical Cataract Classification and Grading System are two examples of the many methods developed to quantify the degree to which a patient has cataracts. 3 Cortical (Figure 2), nuclear (Figure 3), and posterior subcapsular (Figure 4) cataract patterns are all seen in clinical practice (Figure 4). Cataract type often does not affect the effectiveness of cataract surgery (except in very advanced forms of cataract).

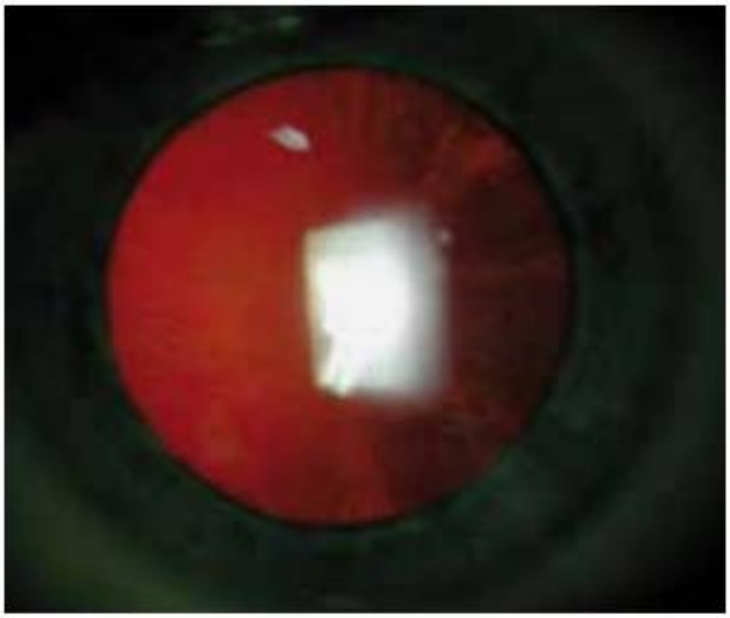

Figure 2. Slit lamp photograph showing cortical cataract changes. Note the wedge shaped or spokelike shadows involving the whole lens

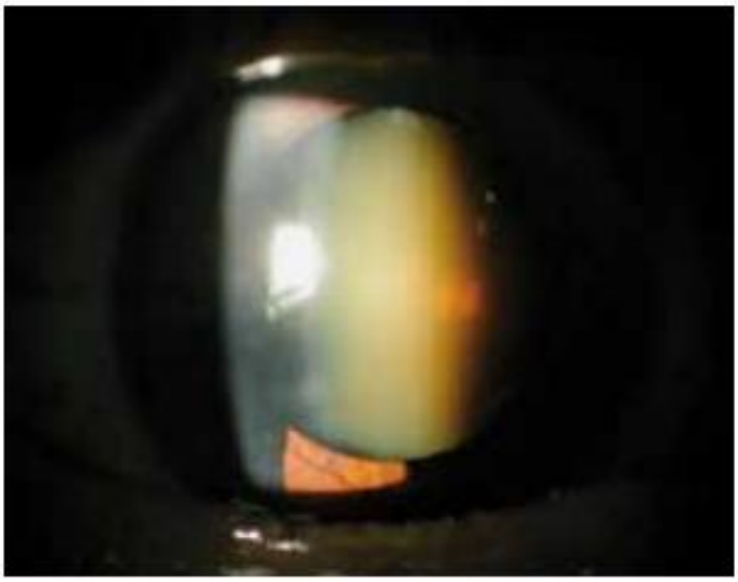

Figure 3. Slit lamp photograph of advanced nuclear sclerosis. As the light beam passes through the eye (left to right in this photograph), reflections are seen from the cornea, iris and the lens. Note the yellow-brown colour of the lens that reduces vision

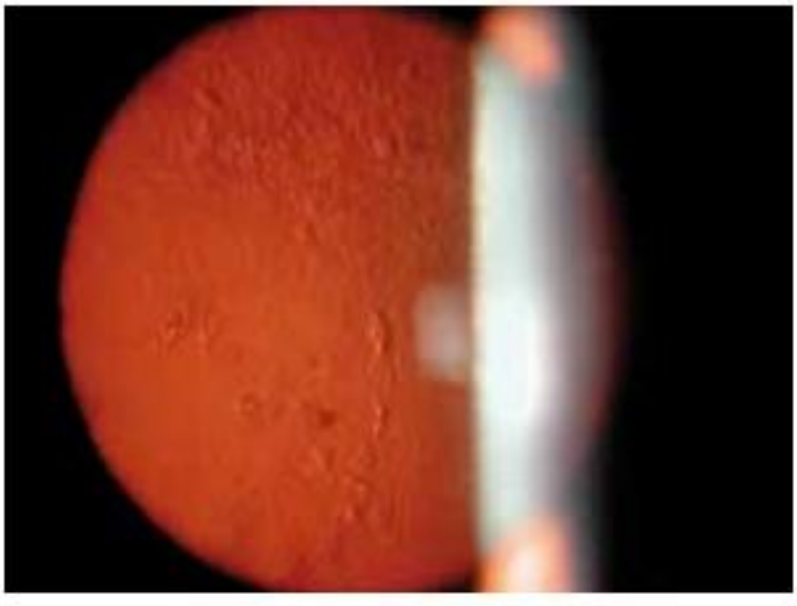

Figure 4. Slit lamp photograph under high magnification showing a bright red reflex marred by posterior subcapsular cataract. Note the granular appearance with some cystic changes when the slit lamp is focused on the posterior capsule

Three significant cross-sectional studies were done in the 1990s to collect epidemiological data on cataracts; these were the Blue Mountains Eye Study, the Melbourne Vision Impairment Project, and the Beaver Dam Eye Study. The development of cortical cataract is strongly linked to both advancing age and exposure to ultraviolet B radiation. Cigarette smoking has been linked to nuclear sclerosis, however the correlation is quite weak. Use of corticosteroids, diabetes, and trauma are established risk factors for developing posterior subcapsular cataracts.

Prevention strategies are listed in Table 1.

Table 1. Prevention strategies for cataract

Primary prevention strategies
• Protection from UV exposure – the wearing of hats and sunglasses may prevent the development of cortical cataract, although cortical cataract is the least visually debilitating
• The role of antioxidants in preventing cataract formation is being investigated, with some trials having positive results,[5] and others negative results[6–8] depending on the formulations used
Secondary prevention strategies
• Early detection may not necessarily prevent any morbidity as this may not translate to early surgical removal
• Regular screening of the elderly population (recommended every 1–2 years) will prevent visually significant cataract from passing undetected[1]

Treatment

Surgery is the only treatment option for cataract.

Indications for surgery are:

• significant functional visual impairment

• Cataracts that have progressed at this point are very dangerous because they may cause secondary problems such lens capsule rupture and corneal decompensation.

• whether cataract removal can help in the treatment of other eye conditions, especially narrow-angle glaucoma and retinal damage.

Cataract surgery has come a long way in the last 20 years, from a large incision within the eye to a tiny incision outside the eye using ultrasound (phacoemulsification) to place an intraocular lens implant (Figure 5). Around 98% of patients who get treatment for vision problems see improvement.

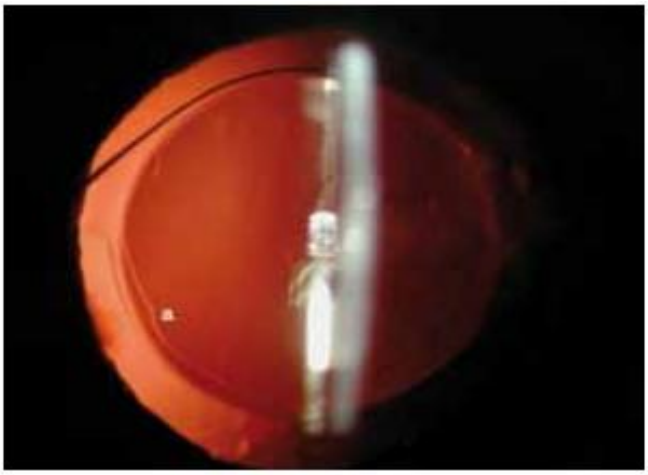

Figure 5. Slit lamp photograph under high magnification showing the intra-ocular lens implant post cataract surgery. The intra-ocular lens lies within the capsular bag, the anterior rim (a) of which can be seen as an irregular circular line within the intraocular lens edge

AGE RELATED MACULAR DEGENERATION

Age-related macular degeneration is the leading cause of blindness in Australia, responsible for more than half of all cases (ARMD). It's responsible for more cases of blindness than any other disease in the industrialized world. 1,4 It is unclear what causes macular degeneration, although recent research points to photo-oxidative stress as a possible contributor. The central vision gradually deteriorates in those who suffer from age-related macular degeneration. Rapid age-related increase in ARMD incidence has been seen. Dry ARMD and moist ARMD are two different conditions. Figure 6 shows how the retinal pigment epithelium progressively deteriorates in dry ARMD, which accounts for 85-90% of patients (RPE)

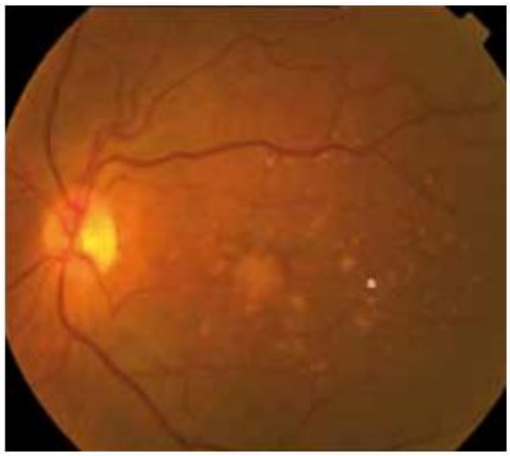

Figure 6. Fundus photograph of the left eye. Drusen (lipofuscin deposits under the retina) (a) are seen as distinct yellow lesions scattered within the macular region. These occur as the retinal pigment epithelium (most posterior layer of the retina) undergoes degenerative change

vision gradually deteriorates over several years when it forms below the macula. The RPE goes through a process of simultaneous shrinkage and hypertrophy; this is clinically referred to as "geographic atrophy" in advanced illness.

A choroidal neovascular membrane develops subretinal to the RPE in 10-15% of instances with ARMD, referred to as "wet ARMD" (Figure 7). Visual acuity (VA) rapidly declines because to leakage of fluid from new arteries into or beneath the retina, which disrupts the alignment of photoreceptors. Disciform scarring and a contracting fibrovascular membrane are hallmarks of advanced illness. Around 2% of dry forms are being transformed into moist ones every year. While ARMD is in its early stages, there are often no noticeable symptoms. Central visual distortion and/or scotomas (Figure 8) and decreased visual acuity are late indications of illness. To the rescue, peripheral vision, and the ability to function independently, tend to hold up.

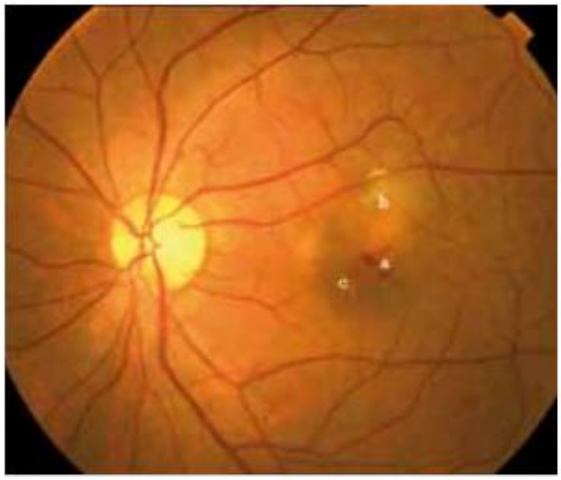

Figure 7. This fundus photograph demonstrates the wet form of macular degeneration. There is an intraretinal haemorrhage (a) at the fovea and an area of subretinal fluid; leakage from a choroidal neovascular membrane (b); and underlying drusen (c)

Figure 8. Simulated view of a patient with advanced wet ARMD. There is a central scotoma with surrounding metamorphopsia (distortion of vision). Peripheral vision is normal

Treatment

With dry ARMD, there is presently no therapy option. Healthy lifestyle changes, such as a diet high in omega-3 fatty acids, vitamin supplements, and quitting smoking, may help patients. Wet age-related macular degeneration therapy focuses on preventing vision loss rather than curing the disease. Preserving vision requires prompt diagnosis of the transition from dry to wet types of ARMD, or the advancement of wet ARMD. Formerly, the sole therapy for neovascularization was the use of a focussed laser on the affected regions. Injections directly into the eye have only lately been a common therapy for age-related macular degeneration. Wet ARMD confirmed by fluorescein angiography is now eligible for ranibizumab subsidies in Australia (under select criteria).

DR and any retinopathy

Digital non-mydriatic retinal imaging was done utilizing the ETDRS standard field 1 (centered on the optic disk) and ETDRS standard field 2 (peripheral retina) for fundus photography (Canon CRDGi with a 20Diopter SLR backdrop, Canon, Japan) (centered on the fovea). Photographs of the retina were evaluated for the presence of DR according to the criteria established by the Early Therapy Diabetic Retinopathy Study. Photos of the retina were reviewed for signs of DR using a standardized process and rated by expert evaluators using a modified version of the Airlie House classification scale.

Glaucoma

Goldmann applanation tonometry was used to assess intraocular pressure. When the pupils had been dilated, an examination of the optic disk was performed using a +78-diopter (D) lens at 16x magnification and a measuring graticule. For a vertical cup-disk ratio greater than 0.6 or an

asymmetry of more than 0.2 A, see References. 24-2 SITA After near refractive correction and dilatation, a static, threshold-related visual field test was conducted utilizing the Humphrey Visual Field Analyzer II (model 750, Carl Zeiss, Switzerland). The algorithm of the instrument determined the accuracy of the test (fixation losses of 20%, false positives of 33%, or false negatives of 33%). If the results of the test of the patient's ability to see were questionable, the procedure was repeated. Criteria for glaucomatous visual field loss included a glaucoma hemifield test grade of "outside normal limits" and a cluster of three consecutive points at the 5% level on the pattern deviation plot. The loss of peripheral vision due to glaucoma, together with the presence of optic disk abnormalities, was used as a diagnostic criterion for glaucoma.

Any ocular disease

Cataract, retinal, diabetic retinopathy (among diabetics), glaucoma, and age-related macular degeneration were all considered to be forms of "any ocular illness.

CONCLUSION

The chance of developing cataracts, macular degeneration, and glaucoma all increases with age. Since that this is an immutable risk factor, the greatest results may be achieved by detecting the illness and its development as early as possible in order to avoid severe VA loss later on. Those with CKD are disproportionately affected by severe eye illnesses, with almost half experiencing visual impairment. Causes of VI such as cataract and retinopathy may respond well to early treatment. Those with CKD, especially those who also have diabetes, may benefit from a screening for ocular illness and VI. Our research may help guide public health efforts to screen high-risk populations for CKD and treat it early on.

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