

Honouring the past, treasuring the present, shaping the future

Dilruwani Aryasingha¹

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Background

Sumanawathie is a village lady, who lives with her husband in the beautiful country side of Sri Lanka. She has lost her vision completely during the latter part of her life and become dependent on her husband who is a farmer who looks after her. Initially they thought blindness was due to some kind of paranormal, mystical or spiritual experience on Sumanawathie's life. But later she was diagnosed to have an irreversible blinding disease.

Andrea Bocelli, a musician, writer and a musical producer of Italian origin, has sold more than 75 million records. He lost his vision at the age of 12 due to a blinding disease. Ray Charles was a blind American singer and a songwriter. Whoopi Goldberg is an American actress, a comedian, author and a television personality, who is on treatment for a sight threatening disease. She is one of the few entertainers to have won an Emmy award, an Academy award and a Grammy award. John Glen is the first U.S. astronaut to orbit the Earth and a U.S. Senator. But his celestial view may not have been possible if he hadn't been diagnosed and treated for an irreversible blinding disease early enough to save his vision.

All these people have something in common with Sumanawathie, although their fate is different to that of hers. This disease can affect the poorest of poor and the rich in equal measure. All these people suffer from an irreversible blinding disease called glaucoma.

In this presidential address I am going to honour the history of this disease, treasure the present and shape the future of these patients. With that we come to the topic, **Honouring the past, treasuring the present and shaping the future.**

History

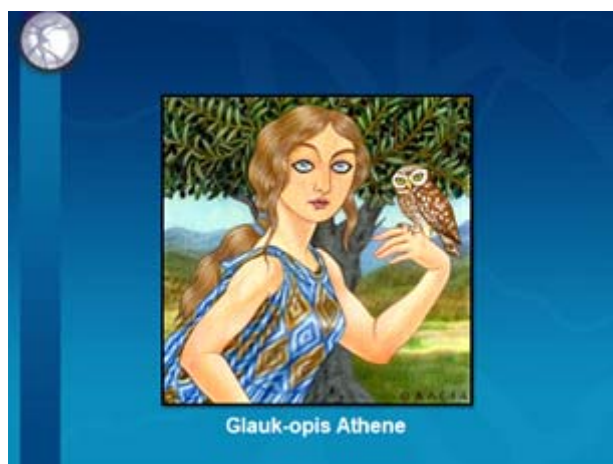
The history of glaucoma is rich and celebrated. Glaucoma has been known in medicine since antiquity. Descriptions of the condition can be found dating back to the writings of Hippocrates in 460 – 370 BC.

Asclepeions or the healing temples, dedicated to Asclepius, the first doctor-demigod in Greek mythology,

located in ancient Greece, in isle of Kos where Hippocrates is said to have received his medical training is the place where the roots of glaucoma originated. Asclepius was said to have been such a skilled doctor, that he could even raise people from the dead.



In the Hippocratic Aphorisms, the term glaucoma was used to describe blindness coming on in advancing years associated with a glazed appearance of the pupil. But the Hippocratic writings make no clear distinction between cataract and glaucoma. Both Classical and Alexandrian Greeks did not recognize the specific disease, which we now call 'glaucoma'.

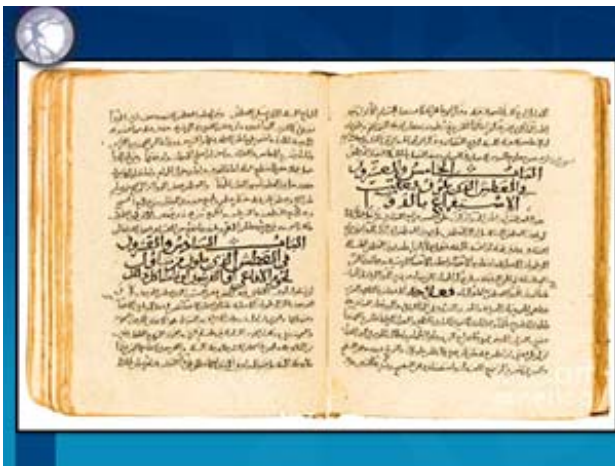


The word "glaucoma", originated from the Ancient Greek word "glaukos" which means blue, green or gray

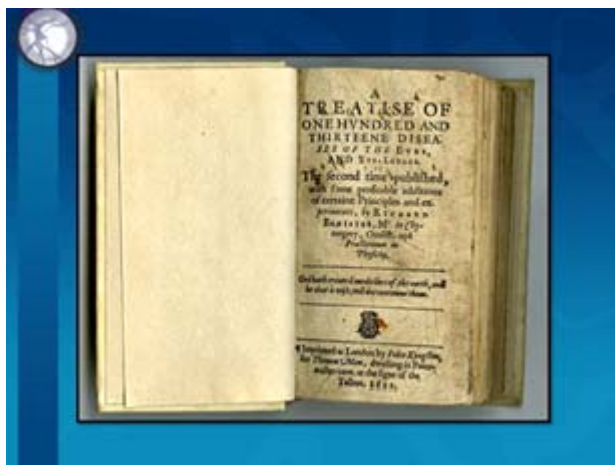
¹Consultant Ophthalmologist – The President, College of Ophthalmologists of Sri Lanka, 2019.

used later with a sense of “bluish-green grey” of olive leaves. Although not emphasized by present-day eye surgeons, the pupil in acute angle closure may appear somewhat green, as the mid-dilated pupil exposes the cataractous lens. Some say the glaucoma originated from glauk-opis Athene, who could be a “bright-eyed” or a “grey-eyed” goddess. In Greek, the word “glauk” meant “the owl” from its bright staring eyes.

The first recognition of a disease associated with a rise in intraocular pressure and thus corresponding to what is now known as glaucoma occurs in the Arabian writings, in the book of “Hippocratic treatment” of Al-Tabari in the 10th century.



In English, the word glaucoma was used as early as 1587. In European writings, it is Dr. Richard Bannister an English oculist of Stamford, Lincolnshire and the author of the first book of ophthalmology in English, the “Treatise of one hundred and thirteen diseases of the eyes and eye liddes” in 1622, who makes the first original and clear recognition of this disease.



He noted the hardness of the eyeball in glaucoma thus being the first to recognise this as a cardinal sign of absolute glaucoma. It was not until the beginning of

the 19th century that the first excellent description of glaucoma with raised ocular tension was given by the French doctor, Dr. Antoine-Pierre Demours. Thereafter the central concept of a rise in the intraocular pressure became fully established.

The final clinical observation in this epoch was the unifying concept of Dr. Franciscus Cornelius Donders a Dutch ophthalmologist in 1862, where he described an incapacitating increased eye tension occurring without any inflammatory symptoms, as Simple Glaucoma. Dr. Stephen M. Drance from the University of British Columbia, Vancouver in 1973, provided for the first time the definition of glaucoma as a disease of the optic nerve or an optic neuropathy caused by numerous factors, called risk factors.



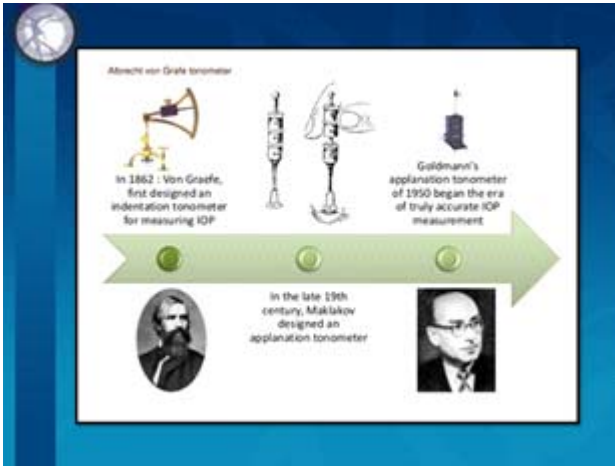
Before the invention of the ophthalmoscope the structure of the eye beyond the pupil aperture was to all intents and purposes a closed book. However it is humbling to read and see from fundus atlases, how so much was achieved a century and a half ago using such primitive methods as a lighted candle and belladonna, to observe the eye. The important invention of the ophthalmoscope by Hermann Von Helmholtz in 1850s made it possible to diagnose the glaucomatous changes in the fundus.



Hermann Von Helmholtz - 1850

Early model of the Helmholtz ophthalmoscope, 1851

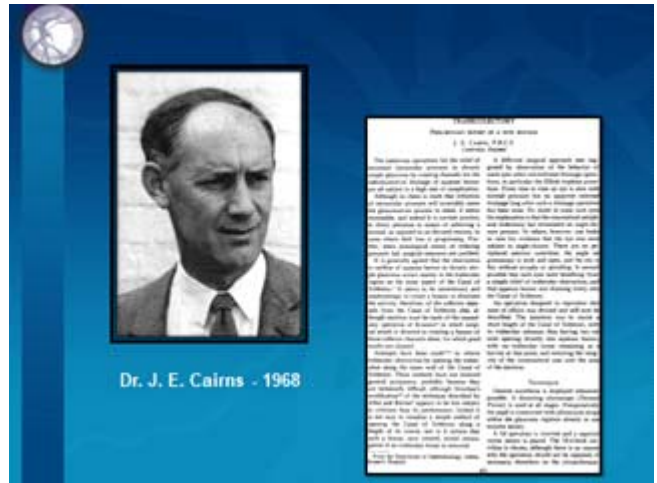
The improvements in measuring intraocular pressure, in the mid 19th century provided tools for better understanding of the disease's key features distinct from other eye conditions.



Albrecht Von Graefe was the first to use surgery to lower intraocular pressure, in 1856. He discovered that iridectomy is an effective surgical method for acute glaucoma treatment. On September 13th in 1857, he reported his findings, at the first International Congress of Ophthalmology held in Brussels. His dissemination of the technique established iridectomy as an important treatment still used today for angle closure glaucoma. Two years later Dr. Louise De Wecker, presented sclerotomy as a procedure for chronic glaucoma. He was the first to advocate the term "filtration", for the treatment of glaucoma which is still in use.



Trabeculectomy for glaucoma, introduced by Dr. J.E. Cairns was in use since the mid-1960s and is the most effective glaucoma surgery in terms of intraocular pressure reduction to date.



History of glaucoma pharmacology begins in 1862, with the isolation of physostigmine from the calabar bean. The Drug treatment started in 1875, with the discovery of pilocarpine from the South American shrub, Pilocarpus Jaborandi. During the 20th century, drug discovery and development accelerated, with the introduction of carbonic anhydrase inhibitors, beta blockers and prostaglandin analogues.



Burden of glaucoma

Despite advances in therapy, the global burden of glaucoma remains high and will continue to rise. The latest estimates by the Vision Loss Expert Group published in the Lancet, demonstrated that 253 million people are visually impaired globally due to various causes.

Glaucoma is the second leading cause of blindness in the world according to the World Health Organization and is a leading cause of irreversible blindness. Overall, glaucoma is responsible for approximately 5.2 million or 15% of the total burden of world blindness. In year 2010 an estimated 60.5 million people suffered from glaucoma. It is projected that by year 2020, this will reach a staggering 79.6 million of whom, 11.2 million will be bilaterally blind.

Glaucoma takes the center stage out of all other causes of blindness as it causes irreversible blindness unlike cataract and it is preventable blindness unlike macular degeneration. Four out of five people, who are blind, ideally don't need to be. Glaucoma will impact the quality of life of all patients with the disease from its inception.

Quality of life in glaucoma

What matters most to you in life? Is it wealth or health? Happiness or education? Is clean air as important as personal safety? Does your age, gender, income affect your choices and quality of life?

What is quality of life?

Quality of life is defined as individuals' perception of their position in life, in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.

Quality of Life is a reflection of a person's overall wellbeing: that is their ability to pursue a happy and fulfilled life. It includes dimensions of physical ability, mental health, general health perceptions, social functioning and independence.



Quality of life can get affected by any form of disability. When it comes to disability, the first thing that comes to our mind is physical disability. But it can come in many forms such as learning disability or psychological disability. The visual disability, ranks among the top ten disabilities in the world according to the World Health Organization.

Visual impairment has a negative impact on both physical and mental health and is a global concern. Although the components of a good Quality of Life differ among individuals and societies, vision has consistently been demonstrated as one of its key determinants.

Reduced health-related QoL occurs even with early stages of glaucoma. Glaucoma subjects in the Los Angeles Latino Eye Study with early visual loss reported poorer QoL scores, compared with healthy controls. As severity of field loss increased, the impact on health-related QoL rose in a linear fashion.

Disease itself as well as the medical or surgical treatment can have an enormous impact on a patient's QoL. Even the mere diagnoses of a chronic irreversible potentially blinding disorder, adversely affect the patient's sense of well-being due to significant anxiety. Loss of visual function is the main determinant of health-related QoL for glaucoma patients. This can impact driving, walking, venturing from home, reading, seeing at night and adjusting to different levels of illumination. This can vary from a subtle blur to missing parts in the field of vision.

Video – Look around, for most of us this is how we see the world. However a person with glaucoma associated vision loss will face dramatic challenges even in familiar surroundings like their home. At early stages of glaucoma, patients report seeing blurry patches in their vision. These can obscure objects in patients sight to the point that the objects seems to have disappear. In advance stages of glaucoma patients report, field of vision to be foggy or blurry. This can dramatically impact patient’s ability to navigate in their surroundings. In extreme stages patients complain, they are looking through large voids in their visual fields. Patients can experience, a debilitating psychological burden because of their inability to accurately describe the visual loss to their loved ones, making them feel alone and helpless in a world that is slowly disappearing before their eyes.

Driving a car is for some, synonymous with independence. Concerns about driving often come up with glaucoma even at early stages. Glaucomatous vision loss may involve not only narrowing of the visual field but also deterioration in the quality of vision. Reduced contrast sensitivity, glare and colour discrimination can occur early in the disease process which can affect night driving.

Video – Imagine if someone with glaucoma was driving to Cinnamon Grand today. Notice the small area to the left of the screen. You see that the impairment shifts when the drivers focal point changes. Even a simple turn becomes a significant obstacle when impaired vision blocks the important details. This cyclist seems to come from nowhere.

Drivers are more likely to make critical errors by missing vehicles, pedestrians due to scotomas in the peripheral field in glaucoma.

When they go blind, what do they actually see? Most sighted people imagine that what the blind see is complete blackness. But it is not that black and white. People, who are blind from birth, obviously have never had the ability to see. It is not really our eyes that actually see the information but the brain that processes it. So, if the brain receives no signals from the eyes to process, a person can see nothing. It is not total darkness in front of them but it is complete nothingness. On the other hand people who lost their eye sight later in life, sees differently. Becoming totally blind, that is losing light perception altogether is rare. This can happen when the optic nerve gets damaged and lose the connection between the eye and the brain like in glaucoma. People who lost their eye sight completely later in life, say it feels like being in a cave in total darkness.

Furthermore, in addition to reduced quality of life due to visual disability there are increased depression rates among patients with increasingly severe glaucoma. Many studies have investigated the relationship between glaucoma, anxiety and depression. As a result of its asymptomatic, chronic nature and potential outcome of blindness, glaucoma often imposes a psychological burden.



Limitation of life spaces due to a variety of factors such as driving limitations, fear of falling and worse balance also contribute to the relationship between glaucoma and depression. Interestingly younger glaucoma patients tend to be more anxious and depressed compared to older ones.

Quality of life depends on social circumstances. Sri Lankan culture and social circumstances are different to many other Western countries. Sri Lanka’s Human development index value is 0.75 and ranked 73rd among the 187 countries. Sri Lanka has one of the fastest aging populations in South Asian region which has led to a rapid transition of disease from communicable to non-communicable diseases.

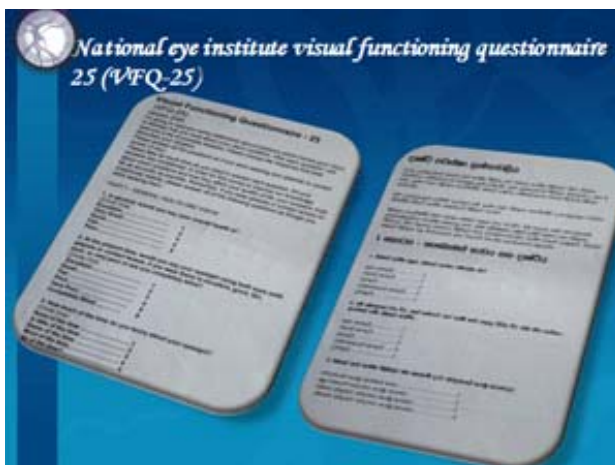
Most of its population resides in rural areas. But there is a significant rural urban disparity with regards to distribution of the resources. Sri Lanka is basically an agricultural country where people depend on export oriented plantation sector and on paddy cultivation. Majority of the rural community live on daily wages. Either they are tea pluckers, farmers or fishermen. Their priorities are different. Their main concern is to earn money for the day to feed their children. Glaucoma would be their least important concern.

Assessing the impact

In addition, driving in Sri Lanka is also not easy even without glaucomatous visual loss. Assessing the

Quality of life in glaucoma under our economic and social background is therefore important.

The quality of life in patients with advanced glaucoma was assessed by using self-administered format of National Eye Institute Visual Functioning Questionnaire - 25. The purpose of this study was to explore whether patients with advanced glaucoma had vision-related functioning difficulties and influence of vision problems on health-related QoL in Sri Lanka. Author presented the data at the 8th World Glaucoma Congress in Melbourne this year. This study was the first of its kind conducted in Sri Lanka. In this study all patients had difficulty in performing daily activities to a certain extent. Almost all were frustrated, anxious and were worried about losing their eye sight and becoming a burden. But 90% of patients had extended family support and they were coping fairly well which is quite different to what we experienced in western countries today.



Reducing the burden

Have we taken the correct path to address the challenges of this complex disease and treasure the present of these patients? Yes we have. During this year as well as throughout the past several years, the College in collaboration with the Glaucoma Interest Group has done an enormous amount of work to reduce the burden of blindness due to glaucoma in our country.

Population-based studies suggest that over half of all glaucoma cases even in the developed countries remain undiagnosed. In the Baltimore Eye Survey, 56% of patients with glaucoma were not diagnosed. Therefore creating public awareness is mandatory. We have conducted public walks in many parts of Sri Lanka to create awareness. Held media conferences to educate the public. Telecasted spot advertisements on television during prime soap opera time where majority of the people watch.



Although the best approach to detect glaucoma is case detection in routine clinics we have conducted population-based mass screening clinics in rural Sri Lanka, with the sole idea of creating awareness. The number of people examined and follow up of these positive cases are no doubt a compelling argument. But these free clinics generate enormous publicity and take the message of glaucoma to their society.

Availability and affordability of glaucoma medication are major challenges related to adherence to medical treatment. The Glaucoma Adherence and Persistency Study, which is the largest study to date on adherence in glaucoma patients identified that cost of medication is a main factor associated with poor compliance. Although, the paradigm of drug of first choice has shifted from beta-blockers to prostaglandin analogues for longer than the past two decades, up until 2015

these were not freely available in the government sector. Average cost of a bottle of prostaglandin analogues is about 1000 rupees and the daily average wage of person is about the same. For an elderly lady who is walking to a clinic with her granddaughter, buying a bottle of first line glaucoma treatment would have been only a dream if it was not for the College. Through the College and Glaucoma Interest Group we were able to facilitate the distribution of prostaglandin analogues to patients free of charge from the government hospitals.

To set up universal standards, college has laid down guidelines for management of glaucoma. Operating with limited workforce is yet another challenge. Not only there are a limited number of eye surgeons in Sri Lanka their distribution within the country is also urban oriented. In addition, a knowledge gap exists among all levels of eye-care workers. The College conducts continuous medical education programmes all over Sri Lanka to train medical officers and general practitioners in detecting glaucoma. Task delegation is another way to improve glaucoma care services. Paramedics can share the consultation with the eye surgeons to save time and serve more people.

Integrating glaucoma care into existing eye care initiatives is another important way to address the challenges faced in glaucoma care. Overall monitoring and care of specific eye diseases such as glaucoma and diabetic retinopathy can be rescheduled within shared care programs. In collaboration with the ministry of health, we have trained 429 medical officers working in hospitals, where there are no eye clinics to use the direct ophthalmoscope to detect diabetic retinopathy and glaucomatous optic neuropathy.



Recommendations

Clinicians often focus on glaucomatous optic neuropathy with serial visual field testing as a measure

of success or failure of glaucoma therapy. Yet this is just one aspect of the overall impact of glaucoma on a patient. From the patient's perspective, the main concerns are often blurred vision, ocular surface discomfort and the risk of going blind.

So, shaping the future of these patients is our responsibility. The aim of the therapeutic relationship between clinician and patient is to maximize the patient's QoL. Preserving vision by preventing glaucomatous visual loss, treating other causes of visual morbidity and minimizing the impact of treatment-related discomfort are some of the means to achieve this end. The ultimate goal of glaucoma management is the preservation of patients' visual function and the quality of life.

Even the mere ability to perceive light is also important for patients with glaucoma. Although keeping light perception does not help the blind people to see clearly, it does help to distinguish between day and night. It is important for us not to abandon these end-stage glaucoma patients, because we feel failure, frustration or because they are blind.



Including provision of palliative measures, counselling on resources that will enable a reasonable lifestyle, compassion and hope, are some of the things we can offer in addition to medical or surgical therapy. At the same time one needs to be careful in labelling a patient with a false positive diagnosis of glaucoma as it can lead to severe frustrating consequences which can hamper their quality of life.

Addressing issues relating to QoL allows both the clinician and patient to re-orientate towards common, realistic goals leading to a more harmonious relationship, better concordance with treatment programs, and patient satisfaction. Our duty is to extend a human hand to light their darken lives and not to put their lives in misery by overburdening with

treatment. Vision rehabilitation is effective in improving functioning of these people with irreversible vision impairment due to glaucoma.

WHO, world report on vision will offer recommendations including ensuring comprehensive and integrated eye care in developing countries.



It is expected, the report will help to shape the global agenda on vision, including assisting member states to improve the lives of people with vision impairment and achieve Sustainable Development Goals in glaucoma care.

Similarly, to the measures that helped eradicate or mitigate the burdens of many diseases in the past centuries, the key solutions to glaucoma-related blindness may lie on basic public health interventions such as better medical training and patient education. Also increased accessibility to technological advances may play an important role to reduce glaucoma morbidity in the next decades.

Conclusion

In conclusion, discovery of the disease called glaucoma dates back to the 17th century. Its important role as a cause of blindness has been known since the 19th century. Initial comprehension of its pathogenesis and treatment belong to the 20th century. Its prevention will hopefully be the work of the 21st century.

It is our responsibility to meet the challenges of glaucoma and make a difference to light the future of these patients. I hope the council will work untiringly in harmony with the membership towards excellence, amidst many challenges to achieve our goals during this year and many more years to come.

I would like to conclude, with this quote by Hellen Keller who was an American author, political activist and a lecturer and the first blind as well as deaf person to earn a college degree.

'Optimism is the faith that leads to achievement'.

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