

Cataract: Fighting a Treatable Blindness

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Currently the cataract is a main cause of visual impairment and blindness all around the world [1,2], responsible for 47.8 - 51% of whole cases of blindness [1,3,4].

Worldwide statistics in 2010 have shown that one in three blind people was blind due to cataract, and one of six visually impaired people was visually impaired due to cataract [5]. The number of blind and visually impaired people is growing exponentially based on aging population [6]. The latest findings highlighted by Bourne, *et al.* [6] evidenced the obstacles in reaching the standards of eye health, specifically unequal blindness prevalence in different regions and gender unequally with dominant woman prevalence in cases of visual impairment and blindness.

Aforementioned tendency will correspond to cataract [7], which is age-related in majority of cases. The estimated number of patients suffered from cataract will duplicate and reach 50 million by the year 2050 in US with majority among Caucasians, but at the same time it will be expected approximately 5-fold increase of frequency of cases reaching 9.51 million among Hispanic Americans [8].

Thus, the cataract as a leading cause of bilateral blindness worldwide represents not only a medical, but also a social problem taking into account the aging population and the growing cases of age-related comorbidities.

Up to present the only available treatment of cataract is surgery. The first documented cataract surgery named couching from 800 B.C.E. was done by inserting a sharp instrument (a needle or lancet) into the lens and dislodging it away from the pupil. Couching was eventually replaced by cataract extraction surgery, in which the lens was removed by extracapsular, intracapsular extraction, phacoemulsification and the Femtosecond laser-assisted cataract surgery (FLACS), which opens a new era in cataract surgery [9], representing an exciting new option to potentially improve patient outcomes and safety. FLACS was approved by Food and Drug Administration (FDA) for cataract surgery in 2010. It's main advantage comparing to phacoemulsification is the use of ultrafast pulses in the range of 10^{-15} requiring less energy for tissue destruction, and therefore increasing its safety [10]. Despite this latest cutting-edge advancement in surgical care, surprisingly couching is still relevant surgical procedure in New Millennium, currently performed in Nigeria, with devastating anatomic and physiological outcomes.

An evolution of surgical technique reaches the peak based on advanced technology with a "smart" intraocular lenses, which highlights an economical burden [11] and raises a question on accessibility and affordability of surgical care.

Likewise, besides expensive operating facilities it is also demand for the ophthalmologists highly-trained in eye surgery. In 2015 in the US nine thousand ophthalmic surgeons have done 3.6 million cataract surgeries [12].

Exponentially growing cataract patients requires the corresponding number of surgeons not only in US, other highly industrialized countries, but at the same time in the countries with low- or middle -income, where cataract cases are more concentrated [13].

The latest available findings evaluating the effectiveness of current medical services worldwide evidenced underuse, which indicates the failure to use effective and affordable medical interventions [14-19].

This conclusion represents a challenge also for cataract, which means that where operating theatre with operating team is not available, the patients will be left untreated.

Over the past decade, efforts have been made to increase access to health care, despite these actions continued reliance on traditional delivery systems will clearly mean continued lack of access for the patients suffering from cataract. With this in mind the key point is that "Everybody has the right to sight".

So how can we improve delivering care to the patients with cataract from one hand and prevent vision loss in patients with cataract from the other hand? How can we cost-effectively treat the raised concerns?

New type of care should be easily accessible for a patient and affordable, and at the same time non-causative for economical burden. These goals are achievable using noninvasive medical care by eyedrops. Today, there is a need to focus on achieving the maximal efficacy of therapy. Developing an understanding of the pathophysiological mechanisms of cataract will certainly allow the formulation and implementation of new, more effective, and safe therapeutic agents, to provide novel treatments to our patients.

Currently available evidence [20,21] indicates that sterol-based drops offer a viable approach for medical care of cataract suggesting that lanosterol is a key molecule in the prevention of lens protein aggregation.

These encouraging preclinical results suggest that a large-scale randomized study should be conducted.

Summarizing, a topical pharmacotherapeutic agent, which will be able to restore the transparency of the human lens, will open a new avenue in the management of cataract bringing us closer to combating avoidable blindness due to cataract.

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