Guest Editorial

Paradigm shift – For effective management of diabetic retinopathy and glaucoma

We are well aware of the changing demographics of people living longer and their changing lifestyles, which is resulting in rapid rise in the number of people with diabetes and glaucoma. With the advent of effective strategies falling in place for the management of cataract and refractive errors, we are now, for the first time, seeing a decrease in the prevalence of blindness. Cataract as a cause of blindness is also coming down. In this scenario, glaucoma and diabetic retinopathy (DR) are emerging as more significant causes of blindness as it happened in the West, decades ago.[1] While this is not desirable, on the positive side, it is now getting much greater attention on all fronts-on the technology side a lot of new innovations and development are happening resulting in improved ways for detecting and treating these conditions. The ophthalmologists are realizing this shift, resulting in greater emphasis on the service delivery front. The policymakers in the government and the international funding agencies which have played a catalytic role in eye care are now making this a priority. Globally, most countries have signed up to make noncommunicable diseases (NCDs) as a priority, and many have now rolled out the management of NCDs at the primary eye care level. All of these open up a lot of possibilities toward addressing these conditions.

However, as articulated by the authors of the article "Community care for DR and glaucoma in India – a panel discussion," this requires a paradigm shift in our perspective to these conditions, and in the manner, we operationalize their management.[2] Case detection and the chronic management are very challenging. The patient is unaware of the onset of either of these conditions and while cataract surgical intervention is instantly appreciated, in these conditions a positive effect of treatment is seldom felt. The treatment effect is something that the patient has to intellectually understand. New partnerships need to be built for effective referral of diabetics for early detection of DR. It also requires a degree of integration with other disciplines of medicine. While it may be acceptable to wait for patients to present themselves with blinding cataract, it would be very unacceptable in the case of DR or glaucoma, since the vision loss is often irreparable. The authors advocate targeted strategies for a high yield of DR. However, the success of an intervention program lies in an eventual reduction in the prevalence of DR. Thus, it is equally important to cost-effectively screen all diabetics and offer appropriate health education. We need to shift the onus of case finding for DR, from ophthalmologists to general physicians and Diabetologists as they tend to be the first point of contact for the target population. With the advent of technology such as AI, this will become a simpler process.

When it comes to glaucoma, the challenges are even greater, as the case detection rates are very low; there is a lot of undiagnosed glaucoma. While "opportunistic screening" is advocated, this is contingent on comprehensive eye examination happening at all such "opportunities," whether it is in a hospital or outreach; this is far from being universal especially in diagnostic outreach. This is another area where a paradigm shift is required of mandating comprehensive eye examination at all levels of eye care.

Both DR and glaucoma require chronic management of periodic assessment and intervention as indicated. A level of proactiveness is required to ensure compliance, which is a lot more critical than in conditions such as cataract or refractive errors. While compliance is dependent on patient behavior, we as providers have to "own" this to find innovative ways to enhance compliance. All of this requires a very different approach than the one time interventions like cataract surgery that we are used to. Building a registry of DR and glaucoma patients will help in triggering timely reminders and more rigorous follow-up. With the advent of information technology, these are very feasible and can be automated to a large extent thereby minimizing the effort.

On the service delivery front, the authors of the article have comprehensively articulated all that is required to treat the condition as well as to prevent or arrest the disease progression through health education and increasing awareness. It is the later that will dramatically reduce the number of patients presenting in advance stages of the disease,[3] as witnessed in the developed countries. However, the game changer in the coming years could be the advancements in the realm of big data analytics, artificial intelligence (AI), and machine learning (ML). Already several applications are out there, that can automatically interpret a fundus image and give a recommendation for a regular or emergency referral. Some of them have been rigorously validated.[4] Most of these are being developed as cloud services, which means that this service will be available anywhere at any time. As this gets widely adopted the quality and reliability of such automated interpretation will evolve to match that of expert levels.

Two great challenges in effective management of DR and glaucoma are case detection and continued follow-up. Often times, the follow-up during the early years of the condition is not appreciated by the patient as the patient does not experience any vision loss nor do they see any improvement with medications, in the case of glaucoma. As a consequence, the follow-up rates drop precipitously with each passing year, while the risk of permanent vision loss increases with time. With the advent of AI and ML technologies, we have for the first time tremendous opportunities for widespread case detection and remote monitoring of patients. Today, pilot projects are happening across several states in the country to integrate early DR case detection and ongoing monitoring at the NCD clinics in primary health centers. The NCD nurses are being trained to maintain an electronic registry and take fundus images for remote reading and diagnosis.

In conclusion, the management of DR and glaucoma will require a paradigm shift in our processes, and we need to proactively embrace newer, nonophthalmic technologies such as AI and ML, develop use cases and integrate them into our practice. This shift, over time, will also usher in more affordable and reliable diagnostic tools for cost-effective screening at the community level. As mentioned earlier, we will need to partner with other disciplines of medicine, especially diabetologists and general physicians. Since these two are highly underdiagnosed conditions, we will need to be prepared on all fronts to deal with larger number of patients who will soon be knocking on our doors in need of medical, laser, or surgical interventions.

"The significant problems we face today cannot be solved at the same level of thinking we were at when we created them." - Albert Einstein (1879–1955), Physicist and Nobel Laureate.

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