DIABETIC RETINOPATHY

A GROWING THREAT TO SIGHT IN INDIA

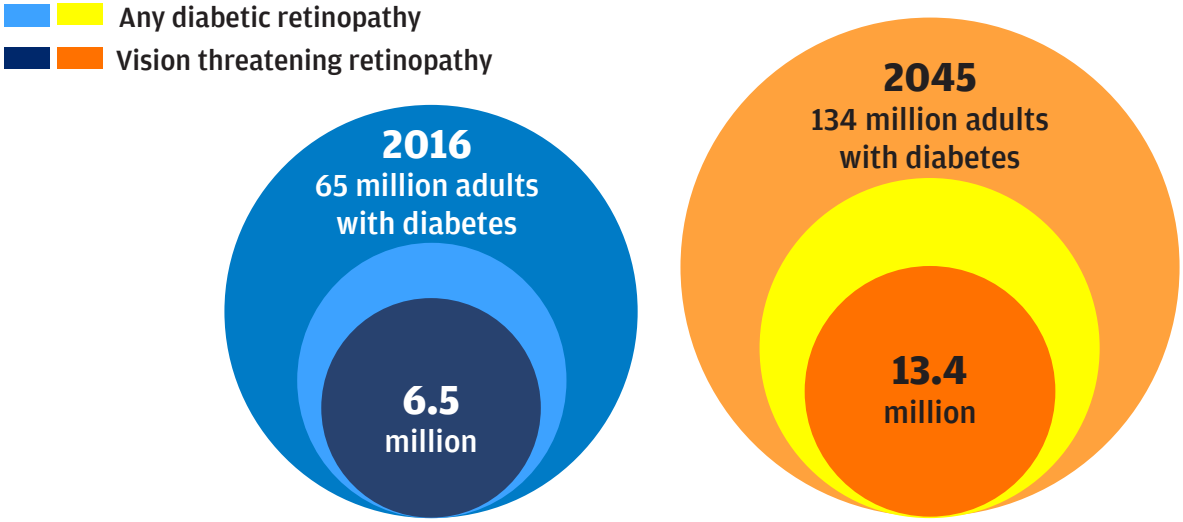
POLICY BRIEF

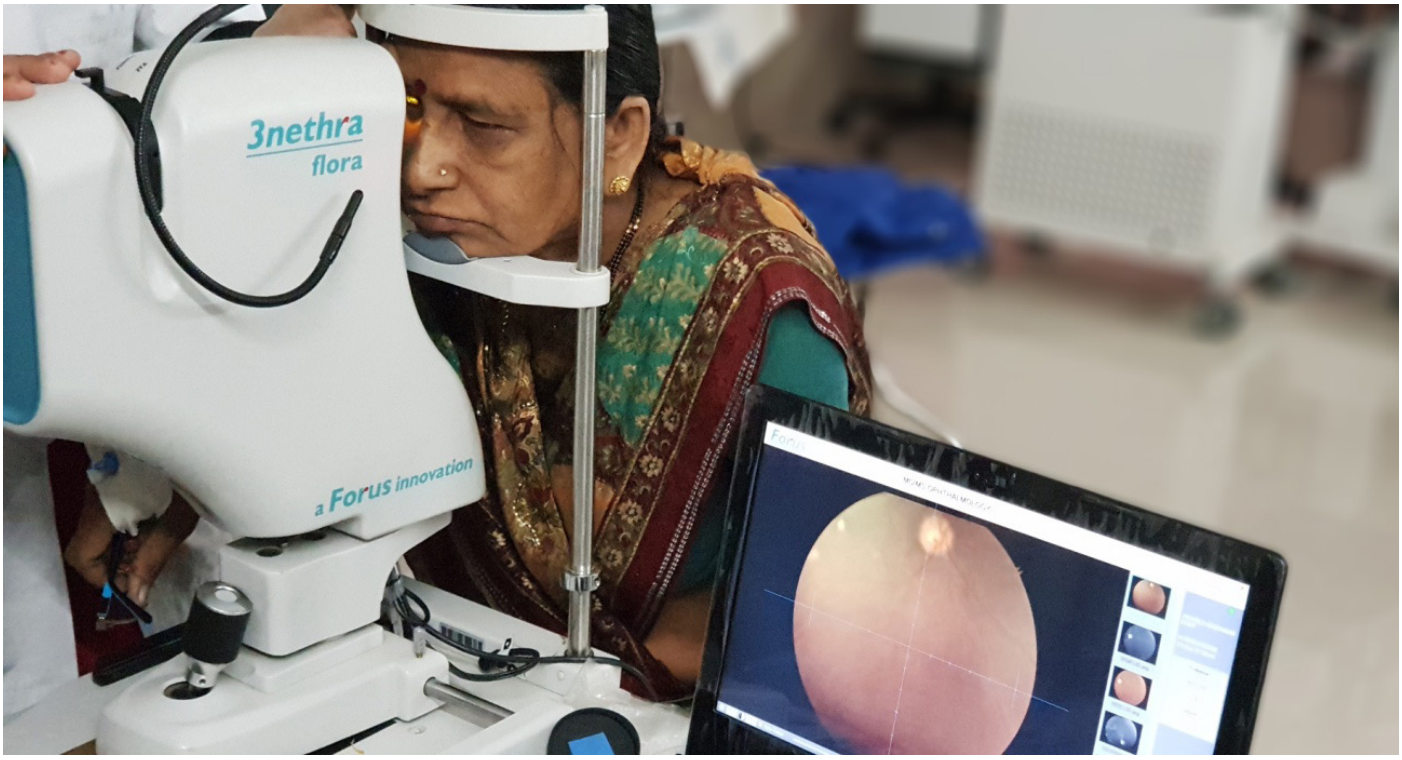
THE PROBLEM

Approximately 65 million adults[1] and 128,500 children in India are living with diabetes. The magnitude for adults is projected to increase to 134 million by 2045.[2] The prevalence of diabetes varies by State (Figure 1), and has increased in every State since 1990.[1]

Figure 1. Variation in the prevalence of diabetes in India in 2016, by State

Diabetic retinopathy (DR) is a common microvascular complication of diabetes. Approximately one in five people living with diabetes in India has some degree of DR (14.6 million in India) and one in ten (7.3 million) has the vision threatening form of DR. The main risk factors for DR are longer duration of diabetes and poorly controlled blood glucose and hypertension.[3] Diabetic retinopathy is a significant cause of disability, including among those of working age.





DIABETIC RETINOPATHY

Diabetic retinopathy results from damaged blood vessels in the retina, the light sensitive tissue which lines in the inside of the back of the eye. The following mechanisms are implicated:

- Leaky blood vessels can cause swelling of the retina
- Blocked blood vessels mean that not enough oxygen reaches the retina
- Abnormal blood vessels can grow on the retina, which can bleed inside the eye

Once vision has been lost from DR it usually cannot be restored.

There is an international classification for DR, and the natural history is known. Some signs of DR are classified as mild, but others are classified as vision-threatening.

Vision testing or a torch light examination of the front of the eye cannot be used to assess whether DR is present, as even very severe DR does not always affect the vision, and the front of the eyes appear normal.

Prevention of DR

There is extensive evidence that good control of blood sugar and blood pressure reduce the risk of vision threatening DR.[4-6] This requires life-style changes, regular monitoring, and adherence to prescribed medication.[7,8]

Strategies to reduce DR will also to reduce chronic kidney failure, cardiovascular disease and the other complications of diabetes.

Screening for DR

The purpose of screening is to detect DR requiring treatment before the patient presents with vision loss. Screening for DR entails detailed examination of the retina. The preferred modality is digital retinal imaging. Low cost imaging systems are available, and allied health professionals can be trained to reliably capture, store, and make a decision whether DR is present or not, with quality assurance mechanisms provided by a specialist ophthalmologist. People with any DR need to be referred to the next level of health care for diagnosis, and treatment if required.[9]

Screening should start at the time of diagnosis for adult onset diabetes; screening should start at the onset of adolescence in children with diabetes. Annual screening is recommended for all.

Treatment of DR

After referral, further diagnostic tests are required to identify those needing treatment. One form of DR is treated by intraocular injection of agents such as Anti-VEGF drugs,[10] which may need to be repeated. New blood vessels need to be treated by laser.[11] More advanced disease requires complex surgery. All patients who have been treated for DR also require long term follow up.

There is good evidence that early detection and timely treatment preserve vision.[12]

ECONOMICS OF DR

Healthcare expenditure in India on diabetes was 8,713 million USD in 2017, but information on the costs of providing care for DR are limited: costs to the German health insurance scheme to was 2.23 billion euros in 2002. A study in India showed that teleophthalmology screening for DR was cost effective ($1320 per QALY) using World Health Organization thresholds.[13]

Strategies to be embedded within Ayushman Bharat14 as part of comprehensive diabetes care, which should include other complications

Community health workers

- Good record keeping of people with diabetes
- Behavior change communication about the complications of diabetes, including sight loss from diabetic retinopathy and the need for annual retinal examination (screening) for DR

Primary level NCD clinics in PHCs and CHCs

- Improve registers of people with diabetes to identify and track access to those needing screening for DR
- Ensure medication (for diabetes and hypertension) is provided for three months, or even six months for those with stable diabetes and hypertension, to reduce overcrowding and improve care in secondary level clinics
- Ensure provision of regular screening for DR within NCD clinics, and referral to District Hospitals of those with DR
- Behavior change communication

Secondary level (District hospitals)

- Ensure medication (for diabetes and hypertension) and insulin are provided for three months, or even six months for those with stable diabetes, to reduce overcrowding and improve care in NCD clinics
- Improve the quality of medical care, e.g., HbA1c testing and regular blood pressure monitoring
- Ensure regular screening for DR within NCD clinics
- Build the capacity of eye care providers in the diagnosis and management of vision threatening DR, with referral of those needing more advanced care
- Ensure availability of Anti-VEGF agents where a trained ophthalmologist is available
- Ensure HMIS systems are in place to track uptake of referrals from primary care
- Behavior change communication

Tertiary level hospitals (Medical Colleges)

- Build the capacity of eye care providers in the diagnosis and management of complex DR
- Ensure availability of Anti-VEGF agents
- Provision of low vision and rehabilitation services for those with irreversible loss of vision
- Ensure HMIS systems are in place to track uptake of referrals from secondary care

Roles and responsibilities at all levels need to be clearly defined and standardized.

IMPLICATIONS FOR THE HEALTH SYSTEM

Providing services that are accessible and equitable for DR will impact on all aspects of the health system, including financing; governance (e.g., National Guidelines for DR); capacity building of training institutions and staff at each level of the health system, with task sharing; providing infrastructure (e.g., dedicated space for screening in NCD clinics) and equipment for screening, diagnosis and treatment; and HMIS to track access, uptake of referrals and the outcome of treatment.

Close collaboration and coordination between physicians and eye care providers is also critical, and synergies are needed between National Programme for Control of Blindness (NPCB) and National Program for Prevention and Control of Cancer, Diabetes, CVD and Stroke(NPCDCS).

Providing equipment for diagnosing and treating DR will strengthen the health system as the same equipment can be used for many other retinal conditions, including age-related macular degeneration which will increase in importance as the Indian population ages.

PROSPECTS FOR THE FUTURE

New, low cost imaging systems, telemedicine, almost real-time automated image analysis, and new generation treatment offer hope for the future in the detection and management of DR.[15]

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