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Diabetic Retinopathy Screening: Importance and Task Sharing Approach in Low Resource Country for Prevention of Blindness

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ABSTRACT

Diabetes mellitus is a leading cause of morbidity and mortality globally. Diabetic Retinopathy (DR) is one of the most common complications of diabetes. It is the emerging cause of blindness in low and middle income countries. Timely detection and treatment of vision threatening DR could help prevention from its blindness. Patients are symptomatic only at the advanced stage of the disease. So awareness and screening for DR are very important for timely detection of diseases. In countries like Nepal, there is scarcity of trained human resource in retina. There is difficult geographic terrain for transport of people for eye check-up from remote areas. The use of allied ophthalmic and allied health personnel working under physician could help in fundus photography, DR screening and referral of vision threatening DR. The studies conducted reported inter-rater agreement of moderate to almost perfect agreement of these cadres with retina specialist. With further training, DR screening be conducted from primary eye care centers, physician clinic and remote parts. This can also help in integration of DR in comprehensive management of diabetes.

INTRODUCTION

Diabetes mellitus is one of the major causes of morbidity and mortality throughout the world. Diabetes is an emerging public health problem as one of the major non communicable diseases in low and middle income countries [1,2]. Diabetes is increasing as epidemics in the urban areas of Nepal. Study reported prevalence of diabetes in urban areas of 14.8% at the 20 years and above and 19% at the age 40 years and above. However, the prevalence of diabetes in rural area is only 2.5% in Nepal [3]. Other population based studies conducted in one of the district comprising both urban and rural areas reported diabetes prevalence of 7.7% at the age 40 years and above and 9.1% at the age 60 years and above [4,5]. The huge difference in this urban and rural prevalence of diabetes is due to change in dietary habits and sedentary life style leading to inadequate physical exercise is urban areas. So emphasis should be given for regular exercise, healthy diets, avoids stress and regular blood sugar monitoring for timely detection of diabetes. .

Diabetic Retinopathy (DR) is one of the most common complications of diabetes. It progresses through various non-proliferative stages to proliferative stage. Diabetic macular edema can occur at any stage of the diseases [6]. DR is the fifth leading

cause of global blindness comprising of 4.8 of total blindness. DR is one of the major cause of avoidable blindness among the working age group in developed countries. More than 90% of the blindness occurs from developing world [7]. The major causes of vision loss in diabetic retinopathy are due to macular edema, macular ischemia and ischemia induced sequelae like pre-retinal hemorrhage, vitreous hemorrhage and tractional retinal detachment. Blindness from diabetic retinopathy is avoidable if timely screening of the diseases and treatment of vision threatening retinopathy. Almost one third of all diabetics have diabetic retinopathy, out of which one third have vision threatening retinopathy that need urgent treatment [7,8].

Patients are symptomatic in majority of the cases during the advanced stage of the disease. On delayed treatment, there is irreversible blindness. We can avoid blindness from DR on timely precautions and proper treatment. There are various areas to be focused to avoid DR blindness. Timely diagnosis of diabetes is very important. In developed countries, almost 5% of patients with newly diagnosed person with diabetes had DR. In Nepal, we have found 7% and 13% prevalence of DR among newly diagnosed diabetics in a population and hospital based study respectively [5,9]. This is because of the uncontrolled blood sugar over the period due to undiagnosed disease. Those who are over 30 years of age, obese and having family history of diabetes should undergo regular blood sugar examination at least yearly and earlier if any symptoms suggestive of diabetes. Awareness on diabetic retinopathy among the public, patients with diabetes, health professionals and stakeholders is very important for regular eye check-up and provision of facilities for screening and management of DR.

In a hospital based study conducted in tertiary eye hospital and tertiary general hospital, half to two third of subjects with diabetes were found aware on DR. However fundus evaluation was lacking [9-11]. Population based study in Nepal reported only 12.5% of overall study population and 40% of people with diabetes were aware of diabetic retinopathy [12]. The more aware on DR among the hospital based studies as compared to population based studies could be due to referral patients from physicians in a hospital based study.

In a study conducted in Nepal, the inter-rater agreement of retinal diseases analysis by allied ophthalmic personnel at primary eye care center as compared to retina specialist using fundus photographs was moderate to substantial. The retinal findings focused were retinal hemorrhage, exudates and maculopathy. The retinal diseases primarily focused were diabetic retinopathy, retinal vein occlusion and age related macular degeneration. The intra-rater agreement was substantial to almost perfect. This shows the good consistency in examination findings [13]. Another agreement study was conducted between allied ophthalmic personnel and retina specialist on diabetic retinopathy grading using fundus photography in a community setting. The results also showed almost perfect agreement on diabetic retinopathy versus no retinopathy and moderate to substantial agreement in vision threatening retinopathy [14]. The ongoing study on agreement of diabetic retinopathy grading on fundus photographs by allied medical personnel working in physician diabetic clinic under the endocrinologist and physician as compared to retina specialist also showed the similar results. These studies highlights that these midlevel health personnel and ophthalmic personnel could be utilized for diabetic retinopathy screening under the supervision of physician and ophthalmologist in primary eye care centers and public hospitals and referral of vision threatening cases for prompt treatment. These units are the first contact point for all diabetics and can be utilized for awareness session on diabetes and diabetic retinopathy. The most important factor for reducing the onset, progression of diabetic retinopathy is control of blood sugar and control of other risk factors like hypertension, hyperlipidaemia [15]. Understrict physician supervision, glycaemic control and other risk factor control is possible. The referral of all diabetic retinopathy from primary eye care center and eye hospitals to physician and endocrinologist is very essential for sugar control and other risk factor treatment. Referral and cross-referral mechanism between eye care professional and health professionals are very essential for prevention of avoidable blindness from DR. Multi-speciality involvement is required for comprehensive care of diabetes and reducing blindness from DR. Support by stakeholders and Government of Nepal for planning and implementation of DR screening in comprehensive diabetes management and DR screening in primary eye care centers are the great step towards reducing avoidable blindness from DR. These could be lessons for other similar low

and mid income countries with DR as an emerging cause of blindness to reduce avoidable blindness of DR.

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