INTRODUCTION

Diabetes mellitus is the third most common chronic disease among children [1]. The incidence and prevalence of T1D varies among different populations and appears to be based upon several factors including racial composition, age distribution and geographic location. The Centers for Disease Control report that approximately 1 in 400 American children has diabetes [2] and Lueder estimated that 1 of every 500 has T1D [3]. The rising prevalence of childhood type 1 and type 2 DM possess a huge risk of visual impairment and blindness due to DR which is an important complication of DM [4].

Diabetic retinopathy has been well described in children. The majority of affected patients do not develop vision-threatening retinopathy until after the teenage years [1]. The risk of developing DR is greater in patients who are diagnosed during or after puberty [5] and studies demonstrate a higher incidence of DR in late puberty than early puberty despite similar durations of disease [6]. Some adolescents lose vision due to macular edema or, more commonly, PDR. Furthermore, a number of adolescent patients rapidly develop progressive DR that leads to irreversible blindness unless it is detected early and treated aggressively [7, 8]. Therefore, early detection of DR and other blinding conditions through screening programmes is critical for preserving vision in patients with diabetes [7,8].

TREATMENT FOR PDR IS BY PAN RETINAL PHOTOCOAGULATION (PRP).

Treatment for PDR is by Pan Retinal Photocoagulation (PRP). However, having been treated with PRP still renders patient at increased risk of reverting to new proliferative disease, without the development of all the classical features of pre-proliferative disease if DM is poorly controlled [9].

CASE SCENARIO

A 16-year-old female from Western Province of Zambia presented to the UTH-EH with complaints of poor distance vision in both eyes for two months. She presented to Lewanika General Hospital (LGH) in a comatose state where she was diagnosed with Diabetic Ketoacidosis and a diagnosis of Type 1 DM was made. Treatment with insulin was initiated. When the patient’s condition was brought under control and became stable, she complained of poor vision in both eyes following which she was attended to at LGH Eye Unit where she was subsequently referred to the UTH-EH for DR management.

On examination at UTH-EH, she appeared appropriate for age and of good nutritional status. Visual Acuity (VA) was 6/12 RE and 6/18 LE. The VA in both eyes could not improve with the pinhole. Her weight was 43.3 kgs, height – 1.6 m, which gave a Body Mass Index (BMI) of 16.9 kg/m². The Blood Pressure (BP) was 120/70 mmHg. Retina examination in both eyes had dot blot and flame shaped haemorrhages, cotton wool spots, hard exudates and new vessels elsewhere (NVEs). The Fasting Blood Sugar (FBS) was 16.3 mmol/l and renal function tests were all within normal range. Fundus Fluorescein Angiography (FFA) findings showed multiple areas of increasing fluorescence suggesting leakage and confirming NVEs, (Figs 1 and 2).

The patient underwent PRP I and PRP II in both eyes. The two were performed a week apart for each eye, (Figs 3 - 6). A week after PRP II her vision improved to 6/6 in both eyes. Subsequent review at 3 months showed that her vision was restored to 6/6 in both eyes. The patient was put-on long-term DR follow up plan. Considering the fact that the patient was below 18 years, her mother consented to the publication of the case including the pictures.
Fig 1: RE FFA confirming NVEs

Fluorescence suggesting leakage from the blood vessels

Fig 2: LE FFA confirming NVE's

Fluorescence suggesting leakage from the blood vessels

Fig 3: Fresh LASER Marks RE

Fig 4: Fresh LASER marks RE
Fig 5: LASER marks LE

Fig 6: LASER marks LE
DISCUSSION
Diabetic retinopathy in children has been well described in the developed world where as in the developing countries it is yet to be described properly. Initially the thinking was that DR could not occur in children, but it evidently occurs as demonstrated by Forlenza and Stewart, 2013. Just as established by Forlenza and Stewart, this report confirms a DR case in a 16-year-old. It has been reported that the majority of affected patients do not develop vision threatening retinopathy until after the teenage years. Some adolescents lose vision due to macular edema or, more commonly PDR. In this case report the patient was an adolescent and a teenager with a huge risk of developing PDR which was the final diagnosis in the patient. From history this had developed rapidly and as reported by other researchers such as Soffer et al. (2003) and Maguire et al. (2006) [7, 8].

Treatable DR is extremely rare among paediatric Type 1 DM [10]. On the contrary, this case had vision threatening DR within 2 months of diagnosis with T1D and her condition needed DR treatment. Moreover, DR can become quite advanced before children recognize and report changes in vision, thus further emphasizing the need for regular screening programs [1]. The case under discussion reported poor vision four days upon recovery from the comatose state during which she was first diagnosed of having T1D.

A number of adolescent patients develop rapidly progressive DR that leads to irreversible blindness unless it is detected early and treated aggressively [7, 8]. Timely treatment with laser photocoagulation can prevent visual loss in vision-threatening retinopathy [11]. Fortunately, this PDR case was diagnosed at the right time and managed aggressively with LASER with good visual outcome. Treatment of affected adolescents is generally the same as for adults – focal or grid laser photocoagulation for macular edema and pan-retinal photocoagulation (PRP) for PDR. Intravitreal injections of anti-VEGF drugs have recently become the standard-of-care for adults, but neither anti-VEGF drugs nor intraocular corticosteroids have been used to treat DR in children due to concerns regarding ocular and systemic side effects [1]. In line with the treatment recommendations for PDR in children, this case was treated with PRP on time, adequately and successfully.

Following the increasing number of children with DR, a number of organizations and institutions have come up with recommendations on follow up of DM patients for DR screening. The American Academy of Pediatrics (AAP) recommends ophthalmologic examinations starting “3 to 5 years after diagnosis if the patient is 9 years of age and above” with annual follow-up examinations [12]. The American Academy of Ophthalmology (AAO) preferred practice pattern recommends the first examination “3-5 years after diagnosis” with yearly follow-up examinations [13]. The American Diabetes Association (ADA) position statement recommends the first eye exam “within 3-5 years after diagnosis of diabetes once the patient is age 10 years or older” with yearly follow-up examinations [14]. The newly published Canadian Ophthalmological Society (COS) guidelines recommend that screening for DR should be initiated “5 years following the diagnosis of diabetes” or at puberty with yearly follow-up examinations [15]. In the Zambian situation the guidelines are that every diabetic child who is ten years and above is subjected to annual DR screening. However, the process of developing protocols is still under way.

CONCLUSION
This case report demonstrates that diabetic retinopathy can occur in children with diabetes mellitus regardless of the type of diabetes. Timely management with LASER can help in maintaining or restoring vision and preventing blindness. Therefore, early detection of DR and other blinding conditions through screening programs is critical for preserving vision in patients with diabetes.
1. Forlenza G and Stewart MW, Diabetic Retinopathy in Children, 2013, Pediatric Endocrinology Reviews (PER) ● Volume 10 ● No 2 ● January; P217-227


10. Treatable Diabetic Retinopathy Is Extremely Rare Among Pediatric T1D Exchange Clinic Registry Participants Diabetes Care 2016;39:e218–e219 | DOI: 10.2337/dc16-1691


