CASE REPORT

Accelerated Diabetic Retinopathy in Pregnancy - A Real and Present Danger

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Summary

A 36 year-old Malay lady with diabetes mellitus in pregnancy and poorly controlled hypertension developed rapid progression of diabetic retinopathy from no retinopathy to florid proliferative retinopathy over three months in her right eye. She had subsequent loss of vision due to vitreous haemorrhage in the peri-partum period. She had good final visual acuity with quiescent retinopathy following pars planar vitrectomy. A similar course was avoided in the left eye by timely pan retinal photocoagulation.

Key Words: Diabetes mellitus, Pregnancy, Hypertension, Diabetic retinopathy, Progression

Introduction

Progression of diabetic retinopathy (DR) during pregnancy is well documented[1,2,4]. In contrast to gestational diabetes mellitus (GDM) which carries no risk of DR, patients with established diabetes mellitus (DM) who become pregnant require regular dilated retinal examinations from early pregnancy for DR. This is because 77.5% of pregnant patients with early DR experience worsening retinopathy, with 22.5% progressing to proliferative DR (PDR)[1]. In contrast, only 26% of patients with no DR at the start of pregnancy develop any DR[1]. A number of risk factors are associated with DR progression in pregnancy.

Case Report

A 36 year old Malay lady, G_4P_{2+1}, who was a pregnant diabetic and hypertensive was referred to the ophthalmologist for routine dilated retinal examination at 12 weeks of gestation.

She had GDM at her previous pregnancy with an elevated post-delivery maternal glucose tolerance test (MGTT). However, she defaulted follow-up and treatment. During her first antenatal checkup at 9 weeks' gestation, she was noted to have elevated blood pressure and urine glucose of 3+. Serum glycosylated haemoglobin level (HbA1c) was 10.7%. Medical treatment comprising subcutaneous insulin 10 units tds and oral methyldopa 250 mg bd was commenced. Antenatal scans were normal.

She had no visual complaints. Visual acuity was 6/6, N5 bilaterally with normal anterior segments and retinal examinations (Figure 1). She was therefore given routine follow-up in three months, during her second trimester.

During her scheduled appointment at 25 weeks' gestation, she complained of metamorphopsia in her right eye of recent onset. Visual acuity was documented as 6/9, N5 bilaterally despite the presence of a dense pre-retinal haemorrhage partially involving the fovea, in association with florid disc neovascularisation which corresponded to PDR with high risk characteristics (Figure 2i). Examination of the left eye revealed dot and flame shaped haemorrhages

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(Figure 2ii) and intraretinal microvascular abnormalities (IRMA) corresponding to severe DR. Arteriovenous ratios were 1:2 bilaterally with peripapillary cotton wool spots.

Her blood pressure was 150/90 mmHg. On review of her records, several pressure spikes were noted. Diabetic control had improved with HbA1c of 8.3%. Urgent PRP was performed in the right eye on the same day and at subsequent weekly visits according to guidelines of the Early Treatment Diabetic Retinopathy Study (ETDRS)[3]. Subsequently PRP was also performed in the left eye in anticipation of similar progression.

Evidence of regression was seen as early as two weeks after PRP. Following delivery of a normal sized infant by caesarean section for failed induction of labour at 38 weeks' gestation, her visual acuity decreased to count fingers at one foot in the right eye due to diffuse breakthrough vitreous haemorrhage. Visual acuity was 6/9, N5 in the left eye with no further progression of diabetic retinopathy post delivery.

The right vitreous haemorrhage did not resolve spontaneously and at five months post-partum, she underwent trans-pars planar vitrectomy with membrane peeling. Post-operative visual acuity was 6/9, N5.

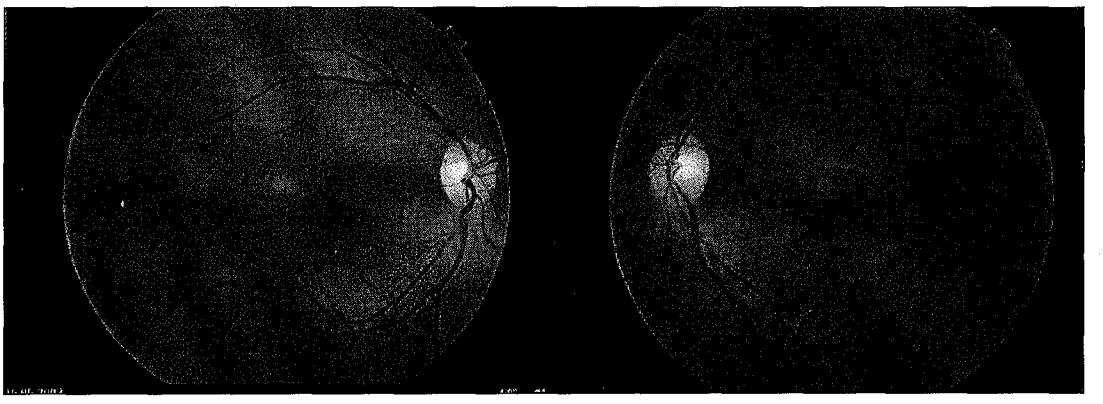

Fig. 1: Dilated retinal examinations at presentation (12 weeks' gestation) revealed normal fundi with no diabetic or hypertensive retinopathy. Right fundus is shown in the picture on the left and left fundus is shown on the right.

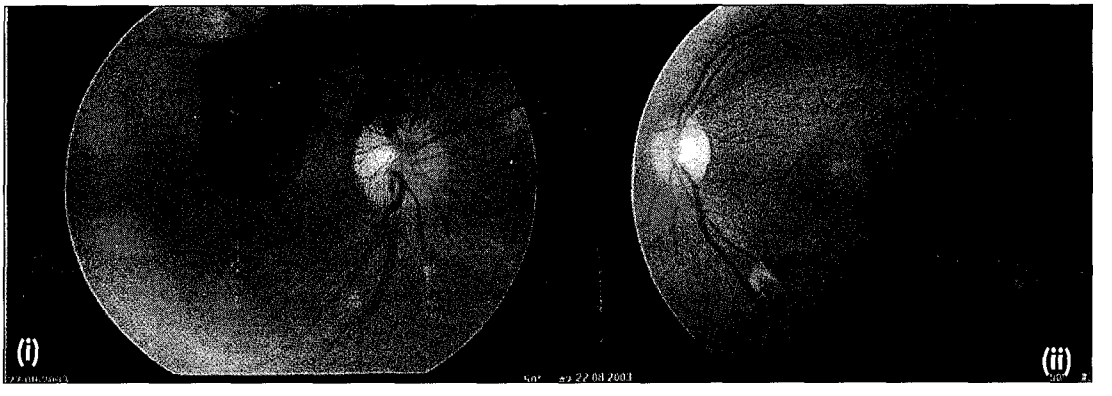

Fig. 2: Dilated retinal examination at 25 weeks' gestation showing i. Dense pre-retinal haemorrhage superior to a hyperaemic optic disc in association with florid neovascularisation at the disc in the right eye and ii. dot haemorrhages and flame shaped haemorrhages in the left eye. Both photographs show peripapillary cotton wool spots and arteriovenous ratios of 1:2.

Discussion

GDM is defined as impaired glucose tolerance of onset in pregnancy with normoglycaemia in the non-pregnant state. GDM is a risk factor for subsequent development of DM. Early pregnancy glucose levels in GDM may be low or normal. Due to stringent antenatal check-ups, an individual may discover she is a diabetic during pregnancy as illustrated here. Newly diagnosed DM in pregnancy is characterized by abnormally high glucose levels in early pregnancy with glycosuria and hyperglycaemia.

Diabetics who become pregnant need more frequent eye examinations. Those with DR and poor glucose control should be managed with a team approach that requires cooperation of the patient's physician and obstetrician[3]. The pathogenesis of accelerated DR in pregnancy is attributed to a hyperdynamic circulation with loss of healthy autoregulation involving compensatory retinal vessel constriction.

Poorly controlled hypertension is an established risk factor for DR in both pregnant and non-pregnant diabetics[1]. Peripapillary cotton wool spots, evidence of poorly controlled hypertension, were noted bilaterally during ocular examination at 25 weeks (Figure 2).

Poor glycaemic control as reflected in elevated HbA1c levels is another risk factor[1]. Interestingly, abrupt institution of metabolic control is correlated with deterioration of DR. Over sixteen weeks, this patient's HbA1c decreased by 22%, reflecting rapid control of blood glucose achieved with insulin therapy. Deterioration of DR was found to correlate significantly with the initial level of plasma glucose and magnitude of improvement during the first 6-14 weeks of pregnancy. Progression occurs in up to 55% of individuals with improved diabetic control[4].

A review of screening and follow-up guidelines is thus needed. In general, one full eye examination per trimester (3 months) and within 3 months postpartum is performed for pregnant diabetics[2]. A common perception is that patients without DR do not undergo significant progression;[1,2] an assumption disproved by this case. Early identification and closer follow-up of subjects at increased risk will help to reduce morbidity.

This disease has significant impact on young mothers who lead productive lives. Pregnant diabetics should be educated on the influence of pregnancy on diabetic control and retinopathy. They should be advised to seek early treatment when symptomatic, even in the absence of retinopathy at first examination. The role of a thorough history including review of risk factors cannot be over-emphasised. Ideally, counselling and patient education should help young diabetics to achieve normoglycaemia 6-8 months prior to becoming pregnant.

A lower threshold for PRP is needed to include fellow eyes that do not meet ETDRS criteria[3] for PRP, when PDR is seen in one eye, with evidence of rapid progression. PRP is able to retard progression of DR and may have preserved vision in the patient's left eye.

The learning points from this case are:

- Pregnant diabetics should be referred to an ophthalmologist for dilated retinal examinations from first trimester.
- Individuals at risk of progression to PDR include those with no DR at presentation, particularly if other risk factors such as hypertension are present.
- Thorough history of potential risk factors should be taken from pregnant diabetics.
- PRP should be given early if there is evidence of rapid progression of DR in pregnancy.

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