

Pregnancy and the implications for eye health

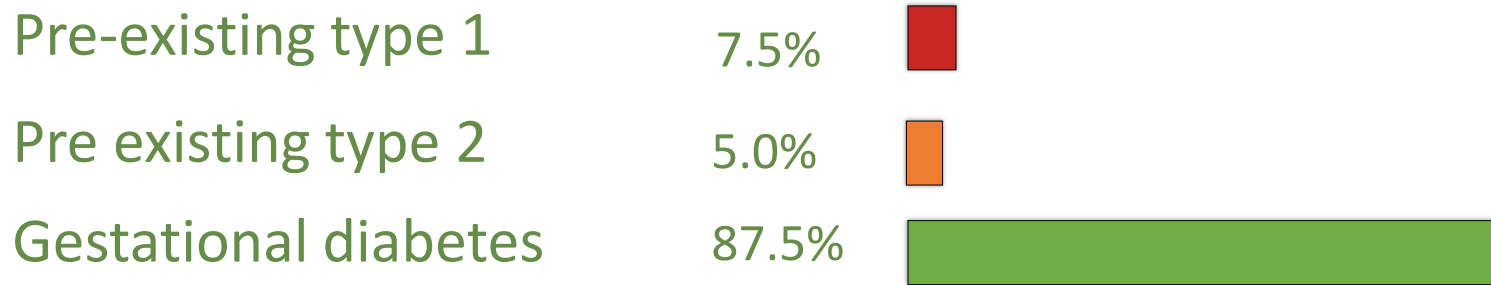
Su Down

Somerset Partnership NHS Foundation Trust

- Need to add....
 - Effect of placental hormones and VEGf
 - Retinal screening recommendations pre and ant partum
 - Challenges for those at transition lost to follow up, type 2 etc.
 - Risk of sudden decline in A1c outside of preg....more so in preg
 - Need to raise awareness to be able to have these discussions with our women of child bearing age...
 - Huge emotional impact on these women once pregnant...see case study

Background

35,000 women with either pre-existing or gestational diabetes give birth each year in the UK



The number of pregnancies complicated by diabetes increased significantly, by 44% in T1D and 90% in T2D over the 15 year period 1998-2013*

Women with T2D are likely to be managed solely in primary care.

*<https://link.springer.com/article/10.1007/s00125-017-4529-3>

Challenges

1

Increasing numbers of women with type 1 diabetes are not attending secondary care.

2

Increasing numbers of women of childbearing age have type 2 diabetes.

3

There is an increasing range of newer therapies to treat type 2 diabetes that are contraindicated for use in pregnancy.

The issues of diabetes and the effect on the baby are well known...

Unless well managed, women with diabetes face an increased risk of adverse outcomes, including:

- Miscarriage
- Congenital abnormalities
- Macrosomia
- Acceleration in present diabetes complications
- Pre-eclampsia
- Still birth
- Post natal adaptation problems

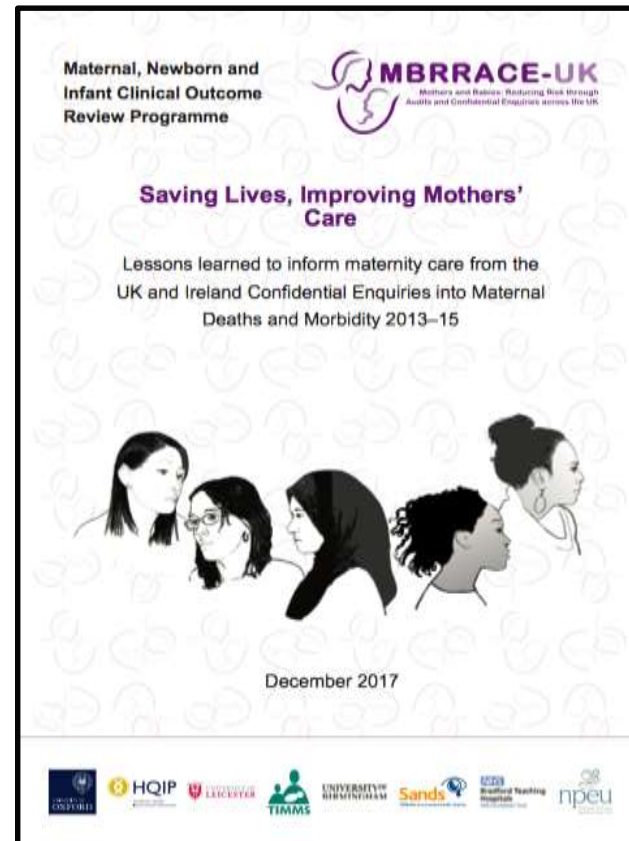


However the challenges for the mother during pregnancy are less appreciated...

- Challenges of sudden glycaemic improvement
 - Retinopathy
 - Nephropathy
- Pre eclampsia
- Ketosis
- Loss of hypo warnings
- Many clinic attendances

Who's responsibility?

“It is the responsibility of all professionals involved in the care of women of reproductive age with co-existing medical problems, whatever their professional background and medical specialty, to provide pre- or post-pregnancy advice and contraception”.



Duration of diabetes and its association with risk of retinopathy in pregnancy

- Duration of diabetes can be associated with more severe retinopathy during pregnancy
- Women with Type 1 are at higher risk of progression than those with Type 2
- Women diagnosed with gestational diabetes are not at risk of diabetic retinopathy progression

But are these changes permanent?

- Women with diabetes who develop diabetic retinopathy during pregnancy (but had no documented evidence of diabetic retinopathy prior to pregnancy) have a high rate of spontaneous postpartum regression.
- Patients with severe proliferative or non-proliferative diabetic retinopathy prior to conception have a higher risk of progression of disease during pregnancy;
- however, some cases of severe proliferative disease progression may eventually show signs of regression in the postpartum period

Cheung A, Scott I, Fekrat S. Ocular Changes During Pregnancy. *American Academy of Ophthalmology EyeNet*. 2013

Mackensen F, Wolfgang P, Max R, Ness T. Ocular Changes During Pregnancy. *Deutsches Arzteblatt International*. 2014; 111(33-34): 567-76

Treloar M, Roybal CN, Niles PI, Russell, SR. Progression of Proliferative Diabetic Retinopathy During Pregnancy. *EyeRounds.org*. Posted September 1, 2015; Available from: <http://EyeRounds.org/cases/219-Gestational-Diabetic-Retinopathy.htm>

Pathophysiology

The exact mechanism underlying the worsening of proliferative diabetic retinopathy during pregnancy is unknown

Human placental lactogen may have the largest impact on progression of disease as it is massively produced and has functions similar to growth hormone.

Believed to accelerate new vessel formation in retina

Mallika P, Tan A, Aziz T, Syed Alwi S, Intan G. Diabetic Retinopathy and the Effect of Pregnancy. *Malaysian Family Physician*. 2010; 5(1): 2-5

Chen H, Newsom R, Patel V, Cassar J, Mather H, Kohner E. Retinal blood flow changes during pregnancy in women with diabetes. *Investigative Ophthalmology & Visual Science*. 1994; 35: 3199-208.

Chew E, Mills J, Metzger B, Remaley N, Jovanovic-Peterson L, Knopp R, et al. Metabolic control and progression of retinopathy. The Diabetes in Early Pregnancy Study. National Institute of Child Health and Human Development, Diabetes in Early Pregnancy Study. *Diabetes Care*. 1995; 18: 631-7

The Diabetic Retinopathy Study Research Group. Four risk factors for severe visual loss in diabetic retinopathy. The third report from the Diabetic Retinopathy Study. *Archives of Ophthalmology*. 1979; 97: 654-5

Hypertension can also cause additional concerns through the pregnancy

- Known risk factor for retinopathy progression
- Particularly hazardous during pregnancy
- 50% of women with hypertension developed diabetic retinopathy progression vs 25% without hypertension

This is a particular concern for those with type 2 diabetes as many have hypertension.

This hypertension is particularly challenging to treat during pregnancy given the limited use of medications.

Treatments available are: Methyldopa, Labetolol.



NICE clinical guideline 63

- Pregnant women with pre-existing diabetes should be offered retinal assessment by digital imaging following their first antenatal clinic appointment and again at **28 weeks** if the first assessment is normal
- If any diabetic retinopathy is present, an additional retinal assessment should be performed at **16–20 weeks**
- Women with Gestational diabetes are not at risk
- Diabetic retinopathy should not be considered a contraindication to rapid optimisation of glycaemic control in women who present with a high HbA1c in early pregnancy.
- Women who have preproliferative diabetic retinopathy diagnosed during pregnancy should have ophthalmological follow-up for at least 6 months following the birth of the baby
- Diabetic retinopathy should not be considered a contraindication to vaginal birth**

Reassuringly the risk of visual loss is low with no pre-existing retinopathy

- Severe proliferative or non-proliferative diabetic retinopathy prior to conception equals a higher risk of progression of disease during pregnancy
- Diabetes in Early Pregnancy Study-
 - 29% of women with moderate diabetic retinopathy prior to conception developed proliferative changes*
 - 6.3% with minimal diabetic retinopathy prior to conception progressed to proliferative retinopathy*
- Even severe proliferative disease may regress postpartum

Pregnancy planning and pre-conception advice



Retinal screening

Retinopathy could develop or accelerate in pregnancy.

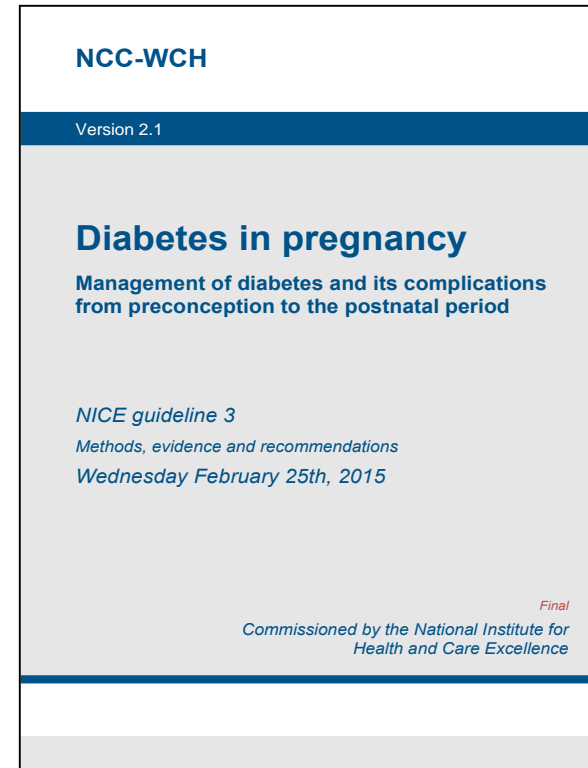
- Retinal screening before and during pregnancy is recommended.



Renal assessment

Refer to nephrologist if:

- Serum creatinine is $\geq 120 \mu\text{mol/L}$.
- Urinary albumin:creatinine ratio (ACR) is $>30 \text{ mg/mmol}$.
- Estimated glomerular filtration rate (eGFR) is $<45 \text{ mL/min/1.73 m}^2$.

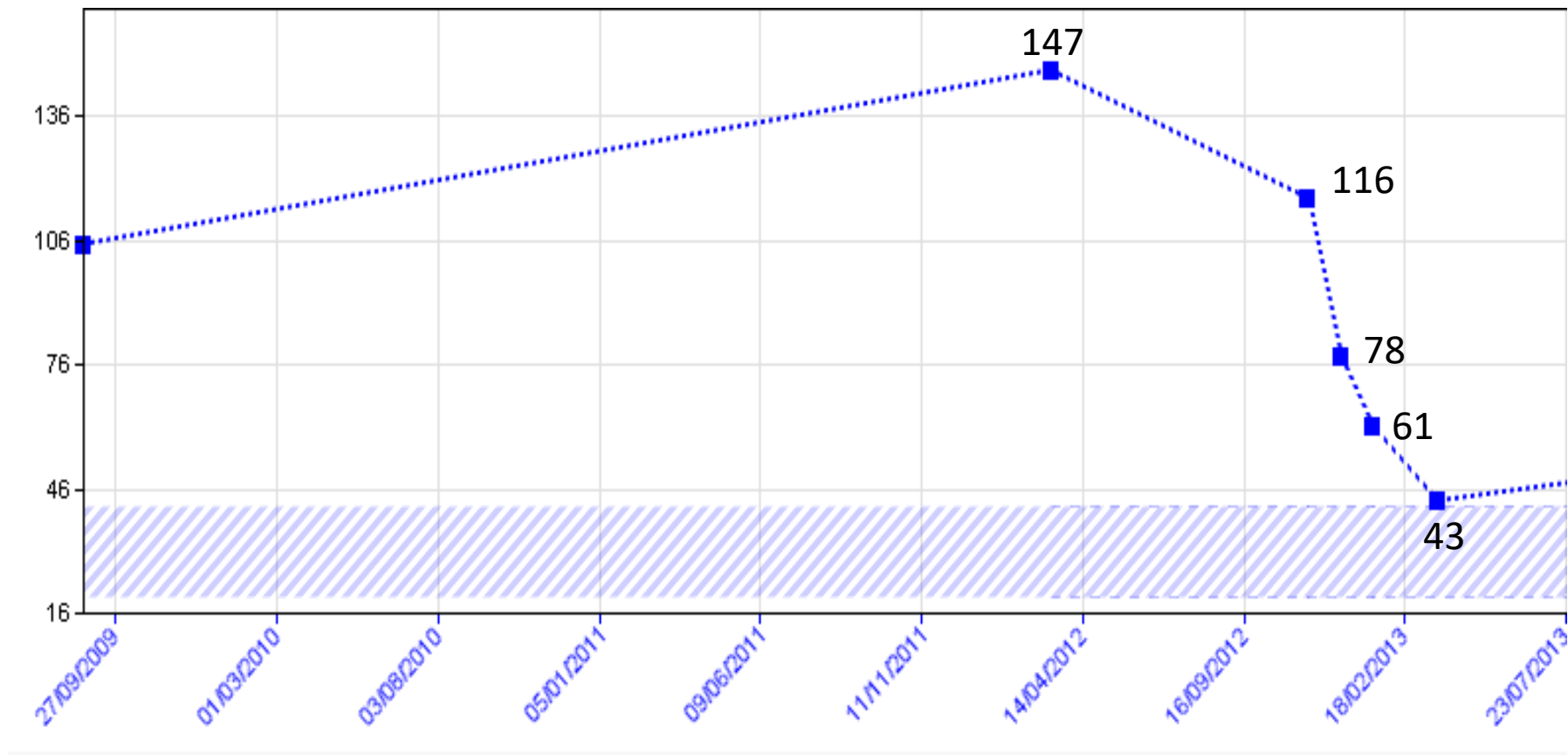


Why we need to encourage attendance to regular retinal screening....

- *Pre Pregnancy advice....* defer rapid optimisation of blood glucose control until after retinal assessment and treatment have been completed. [2008]
- *Ante natal advice...*retinopathy should not be considered a contraindication to rapid optimisation of blood glucose control in women who present with a high HbA1c [2008]

First contact with ante natal service at 5 weeks gestation

- HbA1c graph



Result...

- During pregnancy with rapid improvement of HbA1c developed macular oedema
- Pre-eclampsia
- Emergency caesarean section performed at 35/40
- Bilateral vitreous haemorrhages - temporary blindness
- Post natal urgent bilateral vitrectomy performed and some sight restored

Summary...

- Pregnancy can have major implications for any pre existing retinopathy
- Pre-conception planning is important for all women, however, if there are any diabetes complications present then it is crucial these women are aware of the risks of an unplanned pregnancy
- With careful planning these risks can be minimised

- Thank you for listening