

Miscarriage Rates and Diabetic Retinopathy Outcomes in Pregnant Women with Pre-existing Diabetes in Birmingham & Solihull

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Introduction

Women with pre-existing diabetes have a higher risk of pregnancy complications, including miscarriage. Earlier studies reported a 2–3-fold higher miscarriage rate compared with general population. However, more recent evidence indicates that the risk only a modest increase.

Diabetic retinopathy (DR) is a marker of chronic hyperglycaemia and microvascular disease. The relationship between DR status and miscarriage risk however, remains unclear.

Aims

To evaluate miscarriage rates among pregnant women with pre-existing diabetes across Birmingham and Solihull and assess whether DR status influences miscarriage risk.

Methods

We reviewed Diabetic Eye Screening Programme (DESP) data from 1 September 2022 to 31 August 2023.

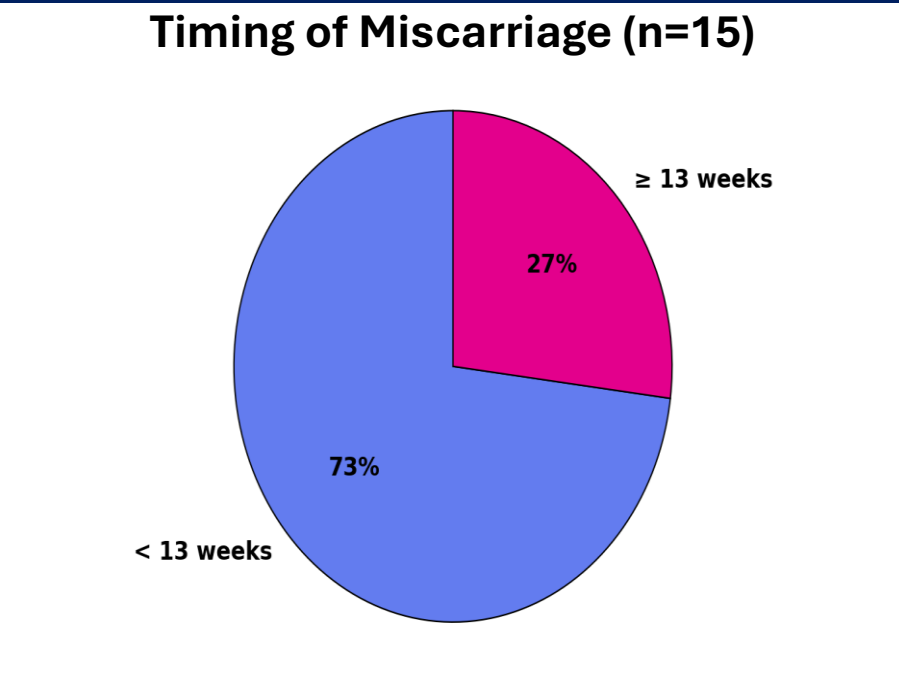
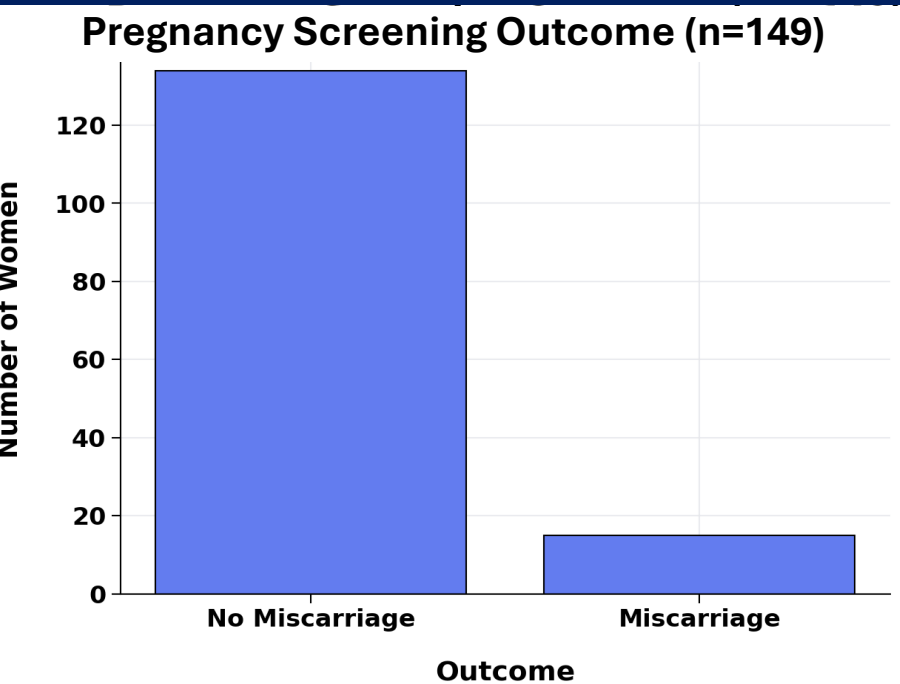
Pregnant women with pre-existing diabetes receiving maternity care at University Hospitals Birmingham were included.

DESP and electronic health records were reviewed.

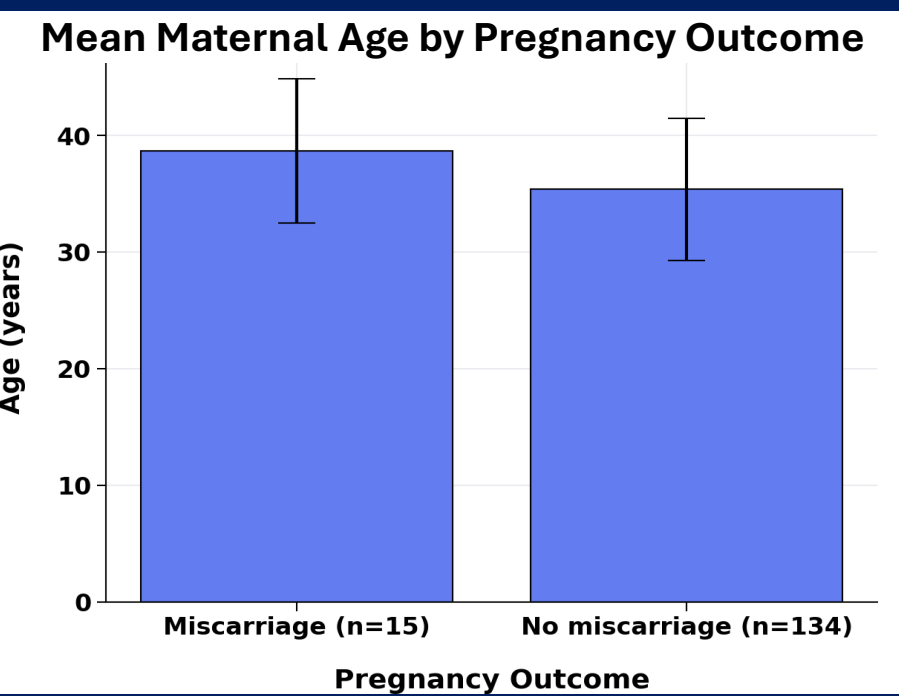
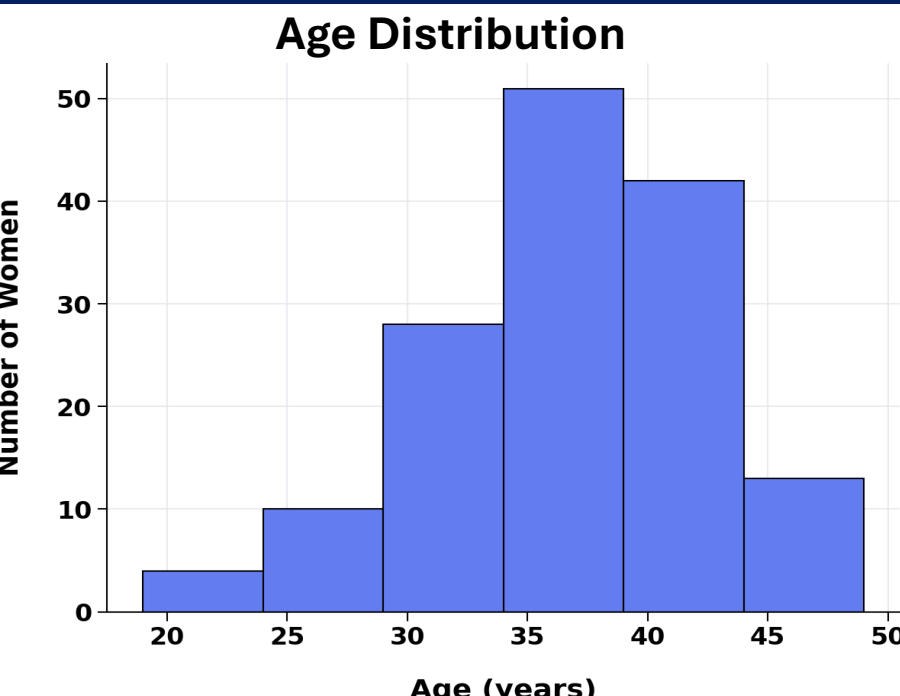
Statistical Analysis: Fisher’s exact test was used to evaluate the association between DR status and miscarriage.

Results

- (1) Of 149 pregnant women invited for screening, 15 experienced miscarriage (10.1%), with 73% (n=11) occurring before 13 weeks’ gestation, and 27% (n=4) before 16 weeks.



- (2) All miscarriages occurred in women with DR R0M0 or R1M0; none required HES referral or ophthalmic treatment.



- (3) Women who experienced miscarriage had a higher mean age compared with those without miscarriage (38.7 ± 6.2 vs 35.4 ± 6.1 years); however, this difference did not reach statistical significance (t-test, $p = 0.06$).
- (4) Miscarriage occurred in 10.9% (15/137) of pregnancies with non-referrable DR and 0% (0/12) with refrerrable DR. There is no statistically significant association between DR severity and miscarriage ($p = 0.61$, Fisher’s exact test).

Results

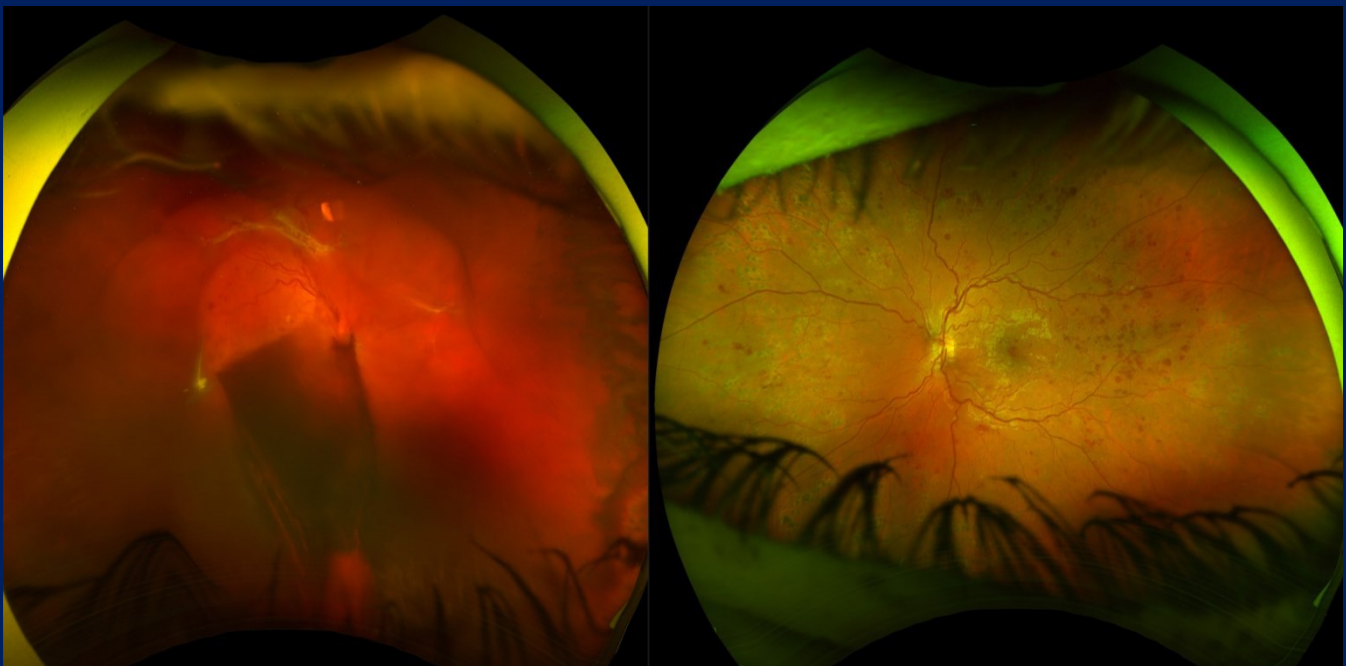
(5) Miscarriage by Diabetic Retinopathy (DR) Status

DR status	Miscarriage (n)	No miscarriage (n)	Total (n)
Non-referrable DR	15	122	137
Refrerrable DR	0	12	12
Total	15	134	149

Analysis was restricted to pregnancies with available diabetic retinopathy grading. Referrable DR: R2+ and/or M1+; Non-referrable DR: R0M0 and R1M0. Fisher’s exact test $p = 0.61$, corrected odds ratio 3.16 (95% CI 0.18–56.1).

- (6) Progression to proliferative diabetic retinopathy (PDR) occurred in 2 women (1.3%).
- (7) The incidence of diabetic macular oedema (DMO) during pregnancy was 7% (8 cases). Of these, 13% (1 case) progressed to bilateral severe DMO requiring steroid implants.

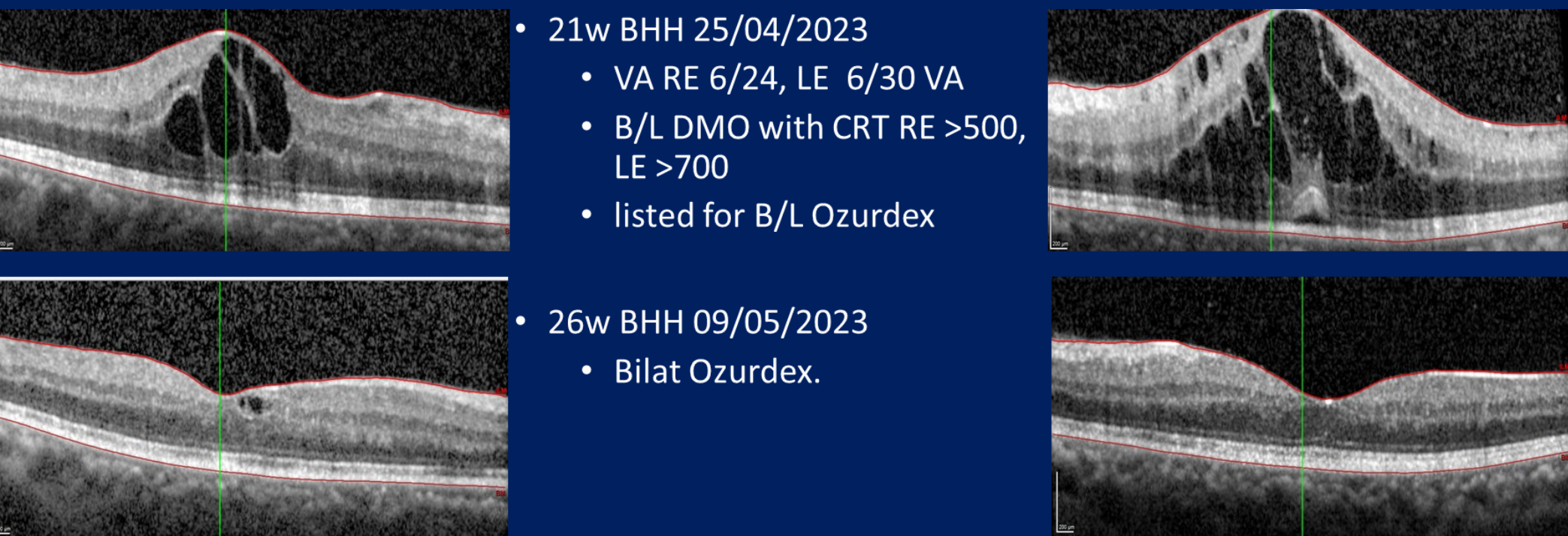
Case 1



A 28-year-old patient with pre-existing type 1 diabetes. High-risk PDR developed during pregnancy. Multiple times DNA for clinic appointments and PRP laser sessions. Right eye had dense vitreous haemorrhage at 23-week pregnancy with bilateral NVE. (NVE, new vessels elsewhere in retina)

Results

Case 2



A 40-year-old patient with pre-existing type 2 diabetes developed severe bilateral diabetic macular oedema during pregnancy. Her vision reduced significantly at 21 weeks of pregnancy. The central retinal thickness measured $>500 \mu\text{m}$ in the right eye and $>700 \mu\text{m}$ in the left eye on OCT. She responded well to steroid implants with complete resolution of the macular oedema.

Discussion

In our cohort, miscarriage rates in women with pre-existing diabetes were comparable to the general population (10–15%), suggesting that miscarriage risk may be lower than historically reported in well-monitored populations.

This study suggests that DR is unlikely to be a major predictor of early pregnancy loss.

Limitation

The study includes a relatively small sample size. Larger studies are needed to confirm these findings and to further evaluate DR progression during pregnancy.