

THE USE OF PLACENTAL GROWTH FACTOR TESTING TO DIAGNOSE PRETERM PRE-ECLAMPSIA

Dr Tamsin Mantel-Cooper, Dr Sameera Gunarathna, Dr Surbhi Sharma, Dr Lynda Verghese

Wrexham Maelor Hospital, North Wales



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Introduction

Placental Growth Factor (PIGF) plays a crucial role in managing preterm pre-eclampsia. During 6 to 18 weeks of pregnancy remodelling of the uterine spiral arteries occurs. Failure of this remodelling leads to pre-eclampsia. This remodelling of the spiral arteries is mediated by angiogenic growth factors such as PIGF. In women who develop pre-eclampsia, PIGF levels are found to be decreased. It is the level of this chemical which helps risk stratify women to appropriately direct surveillance and care provided and optimize the pregnancy outcome.

NICE recommends the use of PIGF testing in the following indications:

- Presentation between 20 – 34+6 weeks
- Isolated new hypertension (>140/90 mmHg)
- Borderline proteinuria (30-50mg/mmol)
- Worsening chronic hypertension /proteinuria in preexisting renal disease/diabetes
- Adjunct to cases with preeclampsia to decide who is likely to need delivery within next two weeks.

Methods

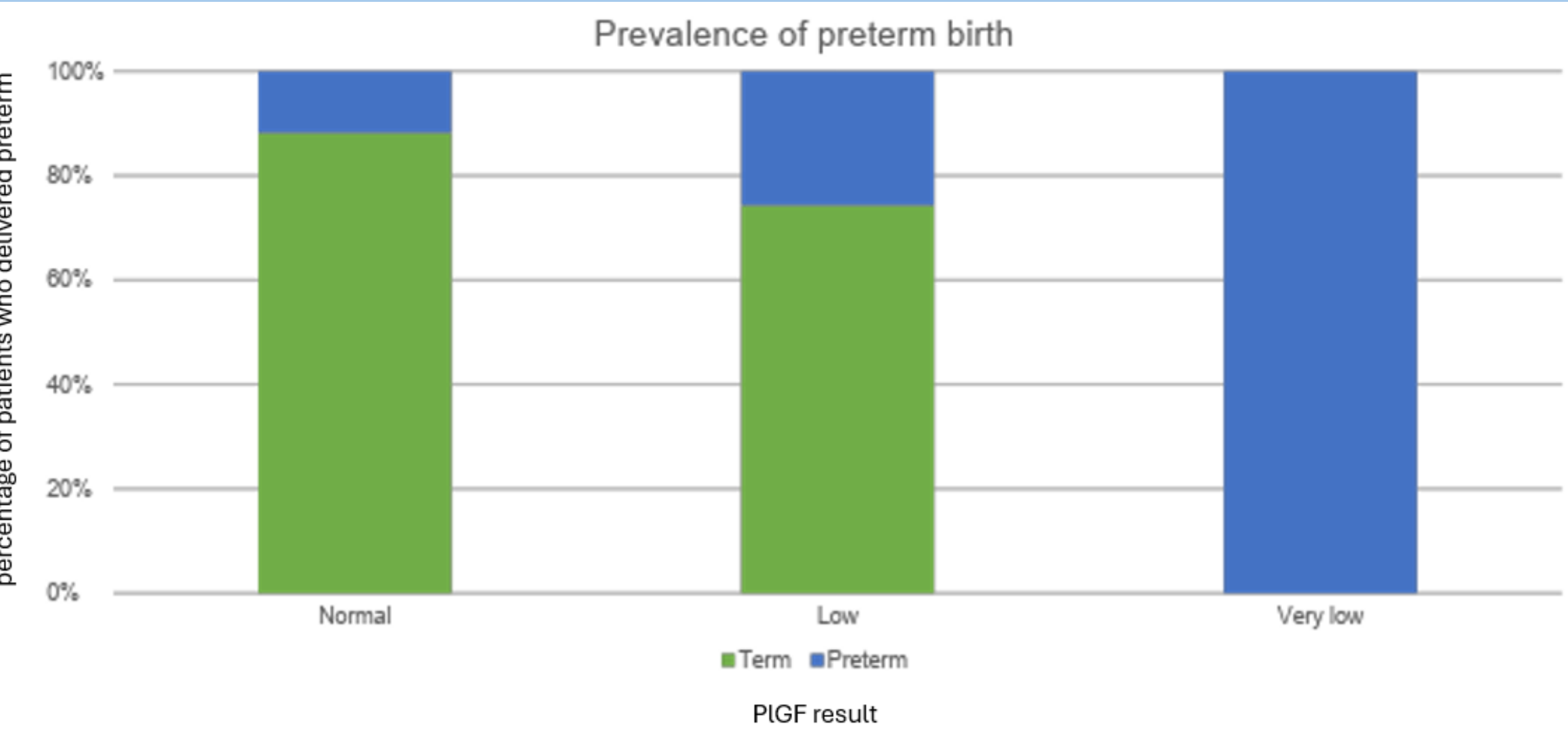
This study followed an initial pilot study in 2021 which included 34 cases. Cross-sectional observational study using data from a single centre. A total of 77 cases were analysed. The outcome of the PIGF test for each case was recorded. The outcome of the PLGF readings are as follows: high (normal), low (abnormal), very low (abnormal). Indications for testing and risk factors were identified in each case. Complications, including severe pre-eclampsia, HELLP syndrome, pre-term birth, severe fetal growth restriction, abnormal dopplers or pathological CTG during delivery were recorded.

Aims

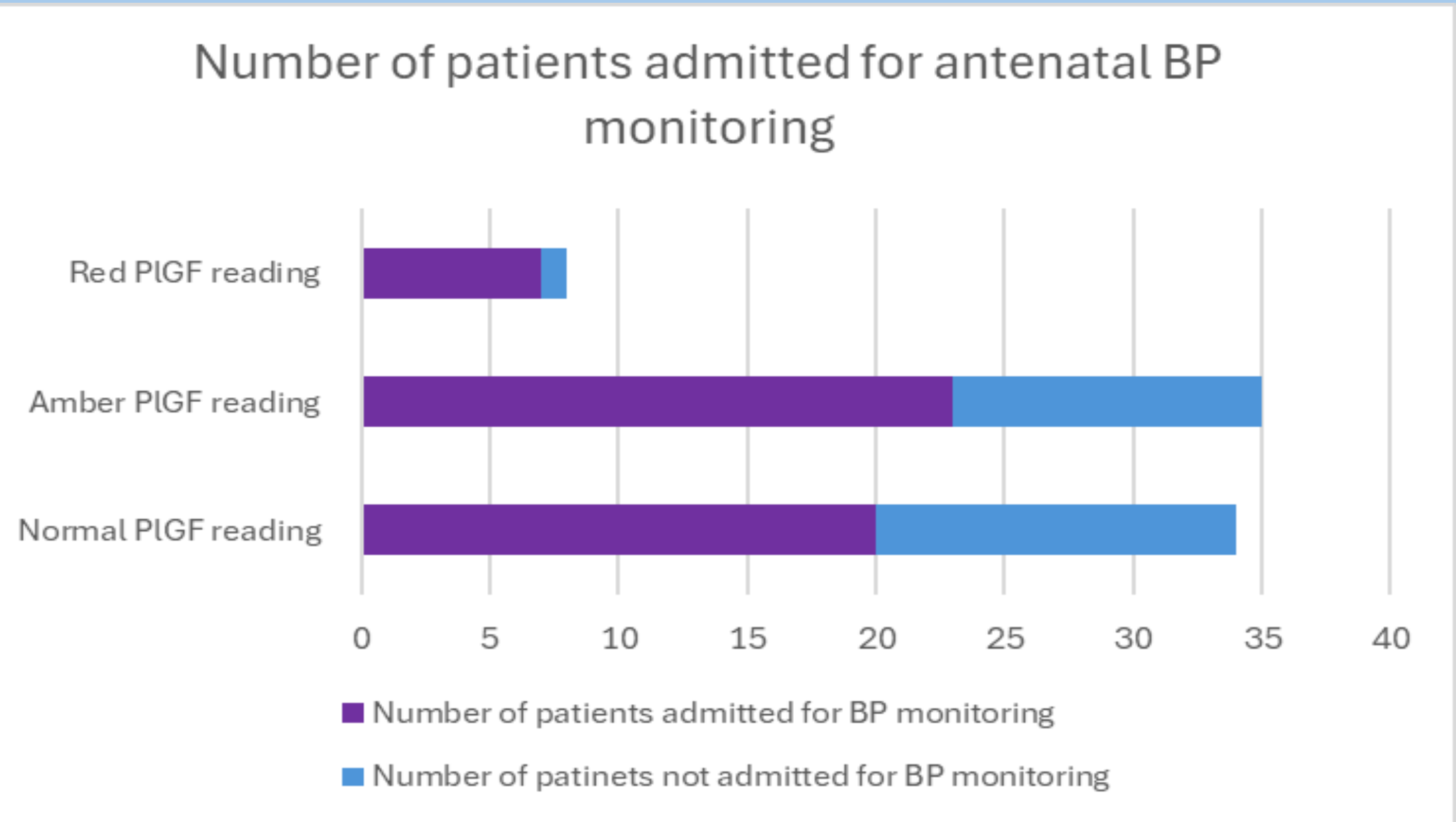
The primary objective of this study is to test the clinical utility of Placental Growth Factor (PIGF) point of care blood testing in the management of suspected preterm pre-eclampsia. Hypothesis: A lower PIGF reading indicates a greater incidence rate of pre-eclampsia and its complications, including preterm birth.

65% (50) of all patients included in the audit were admitted for BP monitoring prior to delivery. 59% (20) of patients with a normal PIGF reading were admitted. 66% (23) of the patients with a low PIGF reading were admitted for BP monitoring. 88% (7) of the patients with a very low PIGF reading were admitted.

All patients with a very low PIGF reading delivered preterm (less than 37 weeks), while 57% of patients with low results delivered preterm. Meanwhile, 9% of patients with normal PIGF results delivered preterm. There were no stillbirths, and preterm births were optimised with steroids before delivery.



57% (4) of the patients with very low PIGF results developed HELLP syndrome, and 100% (8) of the patients with very low PIGF results had complications of pregnancy including: HELLP syndrome, severe pre-eclampsia, severe fetal growth restriction, abnormal dopplers or pathological CTG during delivery. The outcome for each patient with a very low PIGF result has been summarised below.



PRETERM DELIVERY AMONG PATIENTS WHO HAD GREEN PLGF RESULTS

Gestation at Delivery	Indication for the delivery
36 weeks	Severe PET not controlled with oral medications. Who needed IV Hydralazine, subsequently MgSO4 Had an EMCS.
33 weeks	Persistent headache, multiple mental health issues, Normal APGARS at birth, BWT – 1.54kg on 1 st centile.
35 weeks	G6P3, previous abruption, previous CS, Essential HTN, Hypothyroidism, Anxiety, severe HTN on multiple medications, CS, BWT – 2.54kg on 44 th centile.
34 weeks	G1P0, Hypothyroidism, Growth <3 rd with absent EDF, EL/CS, BW centile 0.

OUTCOMES FOR PATIENTS WITH RED PLGF RESULTS

Parity	Risk factors	PLGF	Outcome
G3P1	BMI>35	<12	HELLP syndrome, Growth <3 rd , Delivery at 33 weeks
G1P0	Primi	<12	Severe PET, HELLP, Growth <3 rd , Delivery at 32 weeks
G2P1	BMI – 50, Essential HTN, previous PIH	<12	Growth <3 rd , Delivery at 31 weeks
G4P3	Previous SGA	<12	HELLP syndrome, Growth <3 rd , Delivery at 33 weeks
G8P1	42 years, Previous SGA	<12	Growth < 3 rd , Delivery at 36 weeks
G1P0	Primi	<12	Abnormal Doppler, Growth <3 rd , Delivery at 36 weeks
G1P0	Family History of pre-eclampsia	<12	Delivery at 36+5, Growth at 26 th centile
G1P0	Primi	<12	Abnormal Doppler, Growth at 6 th centile, Severe PET, Delivery at 30+4 weeks

Conclusions

All the patients who had red results had preterm deliveries due to various complications. Patients with very low (red) PIGF results are more likely to develop complications such as HELLP syndrome, severe pre-eclampsia, severe fetal growth restriction, abnormal dopplers, or pathological CTG during delivery.

Nearly 90% of patients with green results had term deliveries. About 75% of patient with amber results were delivered at term.

Overall, PIGF is an excellent supportive tool in managing suspected preterm pre-eclampsia, providing reassurance for outpatient surveillance, alleviating maternal anxiety, and allowing patients to safely go home. Therefore, reducing unnecessary inpatient admissions, and optimising staff utilisation and saving hospital beds.

77 cases were included in the study, 34 (44%) had a normal PIGF reading, 35 (45%) had a low (abnormal) PIGF reading and eight (10%) had a very low (abnormal) reading. The most common indication for testing PIGF was an isolated episode of new hypertension. Patients who had PIGF testing commonly had risk factors including hypertension in previous pregnancy and a BMI greater than 35.

