

# Screening for gestational diabetes: Comparing NICE criteria vs. RCOG criteria recommended during the Covid pandemic – role of HbA<sub>1c</sub> in GDM screening

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## INTRODUCTION

- Diabetes during pregnancy, including Gestational diabetes mellitus (GDM) is associated with significant risk of adverse perinatal outcomes.
- NICE recommends targeted screening for women at-risk with a 75g oral glucose tolerance test (OGTT) to identify women with GDM, based on evidence from studies confirming correlation of blood glucose level (OGTT) with outcomes.
- During the Covid-19 pandemic the RCOG suggested alternatives to OGTT to reduce risk of Covid-19 transmission and suggested HbA<sub>1c</sub> ≥ 39 mmol/mol OR fasting plasma glucose ≥ 5.6 mmol/l OR random plasma glucose ≥ 9 mmol/l to diagnose GDM.
- We aimed to examine the disparity in identification of GDM using the RCOG criteria (HbA<sub>1c</sub> ≥ 39mmol/mol or FBG ≥ 5.6mmol/l) during COVID-19 pandemic, from the conventional NICE guidelines.

## METHODS

- Of all deliveries between 2009–2013 (n=40,740), excluding women with pre-existing diabetes, utilising NICE recommended risk stratification, 8,542 were categorised as “high risk” for GDM who had simultaneous OGTT and HbA<sub>1c</sub> estimations for GDM screening.
- Locally HbA<sub>1c</sub> is routinely undertaken along with OGTT as a standard practice
- Data was analysed to explore the disparity in proportion of women diagnosed a GDM using the traditional NICE criteria and the RCOG criteria suggested during the pandemic
- Binary logistic regression was used to determine the association correcting for significant demographic and biochemical factors. The differences between frequencies/proportions were analysed by Chi-square test. P-value of <0.05 was used for statistical significance.

## RESULTS

- Of the 8,542 women deemed ‘high risk’ who had GDM screening the proportion diagnosed as GDM were:
  - NICE (OGTT) criteria: 965 (11.3%)
  - RCOG criteria: 1,307 (15.3%)
- HbA<sub>1c</sub> ≥ 39 mmol/mol was observed in 13.5% of women and FBG ≥ 5.6 mmol/L in 4.5%.
- Table 1** compares the two criteria in diagnosing GDM
- The two criteria would identify different cohorts as gestational diabetes
- RCOG criteria if used alone would have diagnosed more women as GDM, though missing the diagnosis in 43.5% of women diagnosed with NICE (OGTT) criteria i.e. 4.9% of the ‘high risk’ cohort who had the GDM screening, suggesting different cohorts diagnosed GDM using the two criteria

## RESULTS (continued)

**Table 1 – Comparing the NICE and RCOG criteria**

NICE criteria	RCOG criteria		
	No GDM	GDM	Total
No GDM	6815 (79.8%)	762 (8.9%)	
GDM	420 (4.9%)	545 (6.4%)	965 (11.3%)
Total		1307 (15.3%)	

- The demographics and glycaemic parameters in the cohorts diagnosed GDM by the two criteria are tabulated in **table 2**.
- Proportion of Asians were higher in the cohort with HbA<sub>1c</sub> ≥39 mmol/mol compared to GDM diagnosed with NICE criteria

TABLE 2	NICE (OGTT) criteria				RCOG criteria			
	Non GDM	GDM	Total	P	Non GDM	GDM	Total	P
Age (years)	28.3±5.8	30.4±5.6	28.5±5.8	P<0.001	28.2±5.7	30.15±5.8	28.5±5.8	P<0.001
Proportion Caucasians, Asians	74%, 13%	66%, 21%	-	P<0.001	75%, 12%	60%, 27%		P<0.001
(FPG (mmol/l))	4.4±0.41	5.3±1.0	4.5±0.6	P<0.001	4.4±0.4	5.1±1.0	4.5±0.6	P=0.001
2-hr BG (mmol/l)	5.3±1.1	8.6±1.9	5.7±1.6	P<0.001	5.5±1.3	7.0±2.3	5.7±1.6	P<0.001
HbA <sub>1c</sub> (mmol/mol)	33.6±3.8	37.9±5.9	34.1±4.3	P<0.001	32.9±3.1	40.6±4.6	34.1±4.3	P<0.001

- The key pregnancy outcomes in the cohorts diagnosed GDM with the two criteria are tabulated in **table 3**.
- With the retrospective design of the study, the cohort diagnosed GDM with NICE had antenatal care and had better outcomes (still-birth and macrosomia) compared to non-GDM, apart from preterm delivery which was associated with higher HbA<sub>1c</sub> as suggested in the RCOG cohort who did not have the intensive antenatal care
- On logistic regression HbA<sub>1c</sub> independently predicted preterm delivery and still-birth, independent of OGTT.

TABLE 3	NICE (OGTT) criteria			RCOG criteria		
	Non GDM	GDM	P	Non GDM	GDM	P
Pre-term delivery	6.7%	9.4%	P=0.002	6.6%	9.5%	P<0.001
Still birth	0.3%	0.3%	NS	0.3%	0.7%	P=0.018
Birth weight (g)	3396	3267	P<0.001	3389	3336	P0.019
Birth weight >4500g	2.7%	1.2%	P=0.026	2.5%	2.6%	NS

ns- not significant (P≥0.05)

## CONCLUSIONS

- The RCOG and NICE criteria when utilised in isolation for GDM screening identify different populations, with a risk of missing GDM-diagnosis in a proportion of women when RCOG criteria is solely applied.
- HbA<sub>1c</sub> could have a supplementary role when used in addition to OGTT in ‘high-risk’ women to identify and to potentially reduce maternal-fetal complications (especially pre-term delivery) through intensive antenatal management.