



មជ្ឈមណ្ឌលជាតិគាំពារមាតា និងទារក
National Maternal and Child Health Center

ទិវាសល្យសាស្ត្រ សម្ភព និងរោគគ្រុន្ត លើកទី៤

ប្រធានបទ៖ «រួមគ្នាបង្កើនគុណភាពសេវាព្យាបាល ថែទាំ និងសង្គ្រោះមាតា និងទារក »

Screening of Gestational Diabetes Mellitus (GDM)
at NMCHC (May 2025 – May 2026)



001654

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Objectives

Purpose of this study

Objectives:

1. Determine the risk factors and incidence of Gestational Diabetes Mellitus (GDM) among pregnant women with risk factors of GDM attending NMCHC.
2. Describe the sociodemographic and obstetric profile of screened women
3. Identify the prevalence of known GDM risk factors in the screened cohort
4. Analyze OGTT results and classify outcomes (GDM, Type 2 DM, Negative)
- 5 Provide evidence-based recommendations for GDM screening at NMCHC

Definition of Gestational Diabetes Mellitus

WHO & IADPSG criteria

"Hyperglycaemia first detected at any time during pregnancy that does not meet diagnostic thresholds for diabetes mellitus."

— WHO, 2013

WHO/IADPSG Diagnostic Criteria (75g OGTT): One step screening approach

OGTT Timepoint	Normal	GDM	Overt Diabetes
Fasting (mg/dL)	< 92	92 – 125	≥ 126
1-hour (mg/dL)	< 180	≥ 180	—
2-hour (mg/dL)	< 153	153 – 199	≥ 200

GDM diagnosis: ≥1 value meets or exceeds threshold | Overt DM: any single threshold met for diabetes

Global & Cambodia Incidence of GDM

Epidemiology and Southeast Asia context

~14%

Global GDM
Prevalence

IDF 2021 estimate

1 in 6

Pregnancies
Affected

Worldwide

8–10%

SE Asia
Prevalence

Including Cambodia

↑ 30%

Increase in
Last Decade

Driven by obesity & diet

Global Context

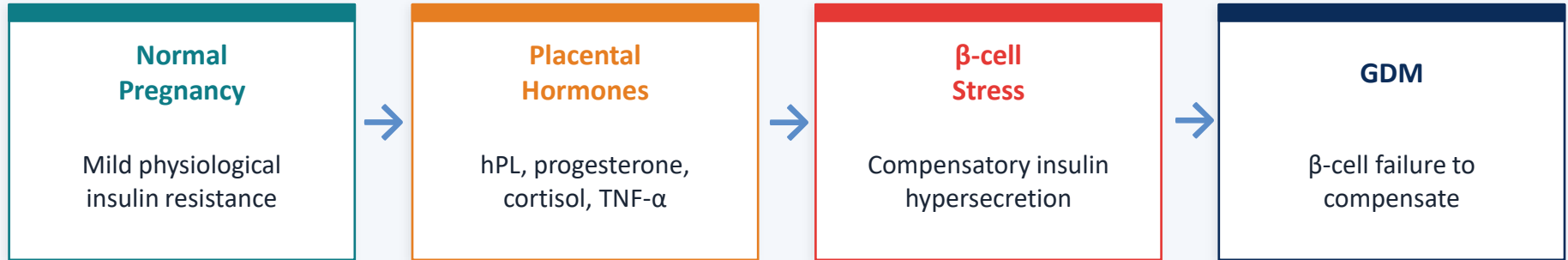
- GDM affects ~14% of pregnancies globally (IDF 2021)
- Highest rates in SE Asia, Middle East, and Sub-Saharan Africa
- Associated with macrosomia, pre-eclampsia, future T2DM
- Mother has 7× higher lifetime risk of Type 2 DM
- Offspring at higher risk of obesity and metabolic disease

Cambodia Context

- GDM prevalence estimated 8–10% in SE Asia
- Rising rates linked to urbanisation & dietary change
- Limited national screening programme
- NMCHC serves as a key tertiary referral centre
- This study: 66.1% abnormal OGTT in high-risk women

Pathophysiology of GDM

Insulin resistance and placental hormone dysregulation



Maternal Consequences

- Pre-eclampsia & gestational hypertension
- Higher risk of operative delivery
- Postpartum progression to T2DM (30–50%)
- Recurrence in future pregnancies (~50%)
- Metabolic syndrome long-term

Fetal & Neonatal Consequences

- Macrosomia (fetal weight >4 kg)
- Shoulder dystocia & birth trauma
- Neonatal hypoglycaemia
- Stillbirth in poorly controlled cases
- Child at risk of obesity & T2DM

Risk Factors for GDM

Evidence-based maternal and obstetric predictors

Advanced Maternal Age

Age ≥ 35 years — most consistent predictor

Obesity / BMI > 30

Increased insulin resistance pre-pregnancy

Family History DM2

First-degree relative with Type 2 diabetes

Previous GDM

50% recurrence risk in subsequent pregnancies

Previous Macrosomia

Prior delivery of infant >4 kg

Glucosuria

Glucose in urine — low specificity but widely used

Polyhydramnios

Excess amniotic fluid — may indicate fetal hyperglycaemia

Hypertension

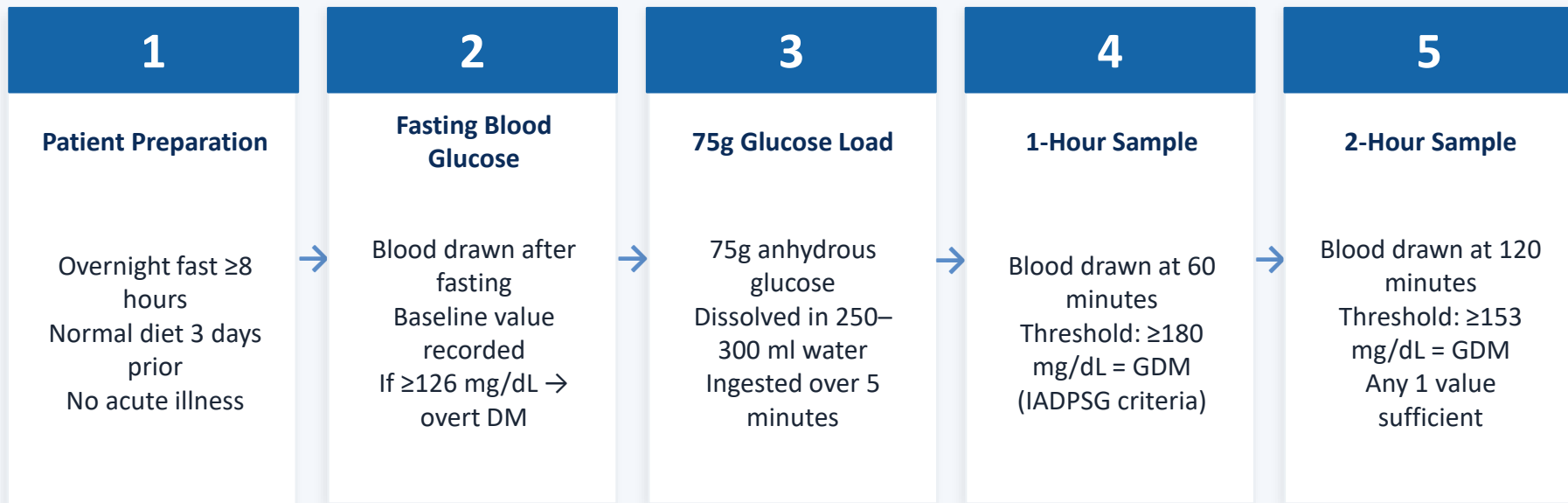
Chronic hypertension or gestational HTN

Multiple Gestation

Twin or multiple pregnancy

Screening of GDM — Oral Glucose Tolerance Test (OGTT)

Protocol and diagnostic approach



Recommended Screening Timing

Universal: 24–28 weeks of gestation | High-risk: First antenatal visit (1st trimester)

WHO Recommendation

One-step 75g OGTT for all pregnant women
or targeted screening in high-risk groups

Patient Demographics — NMCHC Study

Sociodemographic profile of 62 screened patients

62

Total Patients
Screened

33.5

Mean Age (years)
Range: 19–49

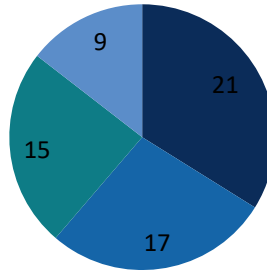
2.6

Mean Gravidity
Range: 1–7

11.3%

Obesity (BMI>30)
7 patients

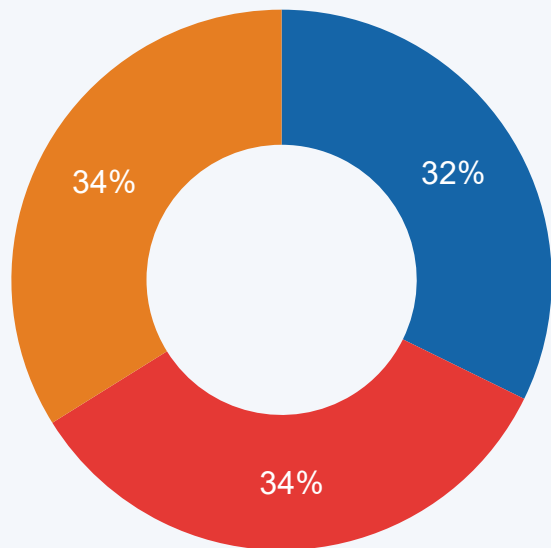
Occupation Distribution



■ Factory Worker (33.9%) ■ Housewife (27.4%) ■ Employed (24.2%) ■ Seller (14.5%)

GDM Screening Results — Diagnosis Outcomes

OGTT classification (n = 62), May 2025–May 2026, NMCHC



■ GDM ■ Type 2 DM ■ Negative

GDM (Gestational Onset) **n = 20**

Hyperglycaemia first identified in pregnancy 32%

Type 2 DM (Pre-existing) **n = 21**

Meets DM thresholds — likely undiagnosed prior 34%

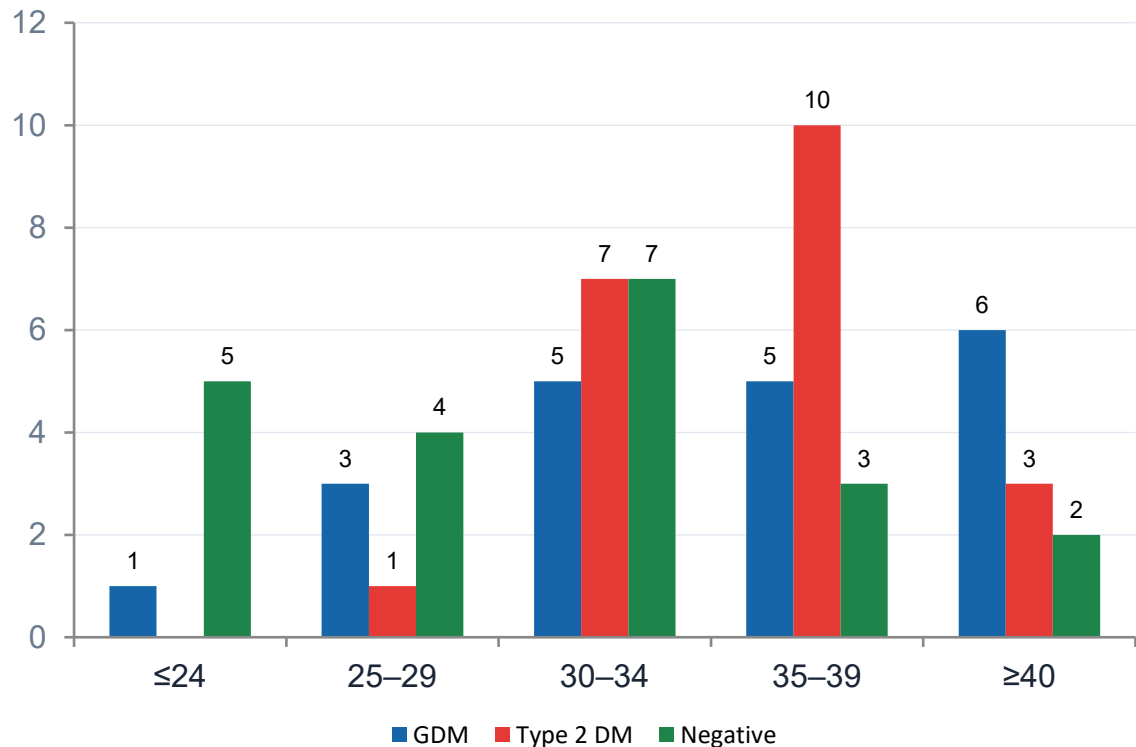
Negative **n = 21**

OGTT within normal limits 34%

TOTAL ABNORMAL: 41 patients (66%)

Maternal Age and Diagnosis Outcome

Age is the strongest predictor in this cohort



Age Statistics

Mean age — GDM

34.8 yrs

Mean age — DM2

35.4 yrs

Patients ≥35 years

29 (46.8%)

Abnormal in ≥35 group

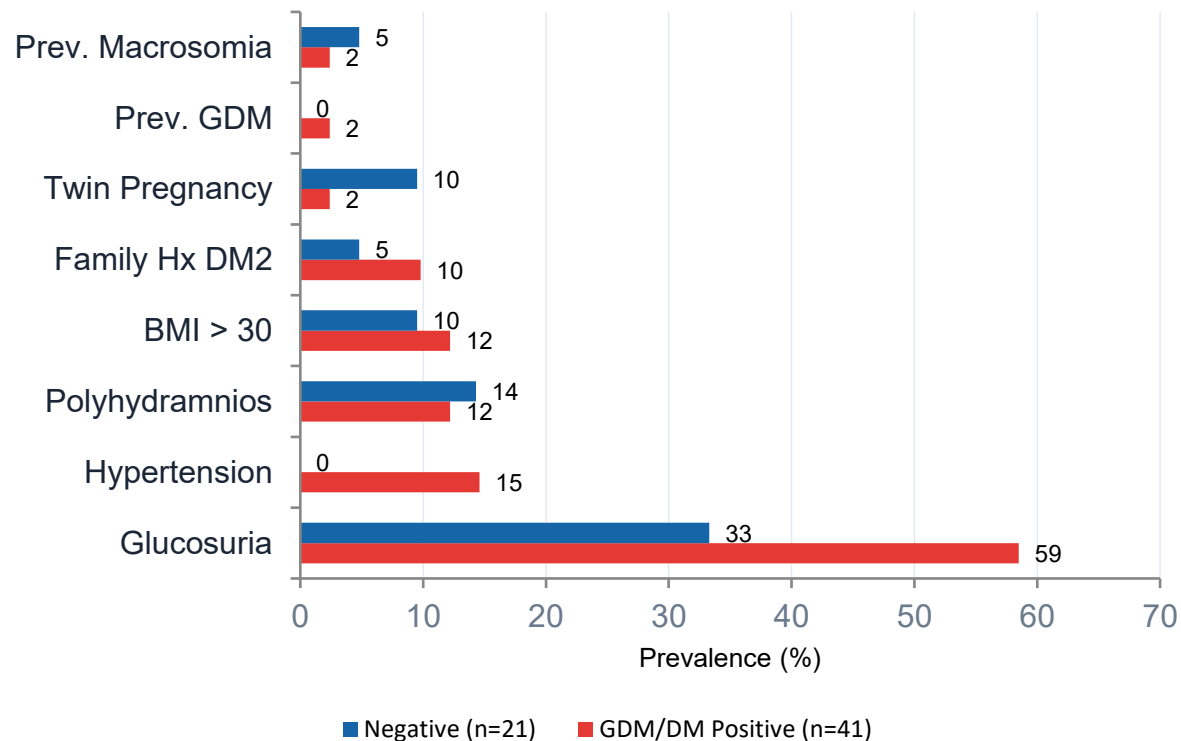
27/29 (93%)

Mean age overall

33.5 yrs

Risk Factor Prevalence in Study Population

Comparison between GDM/DM group and Negative group



Key Findings

Glucosuria present in 58.5% of GDM/DM vs 33.3% negative — most common finding

Hypertension exclusively in GDM/DM group (14.6% vs 0%)

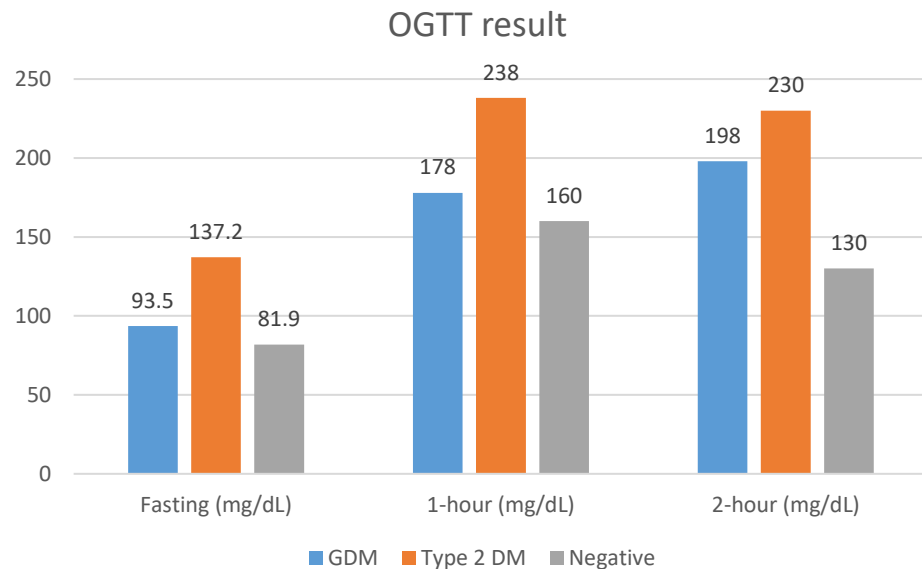
Family history DM2 higher in GDM/DM (9.8% vs 4.8%)

Previous GDM rarely documented — under-reporting likely

Glucosuria: 1+(19.4%) 2+(17.7%)
3+(11.3%) 4+(1.6%)

OGTT Laboratory Results

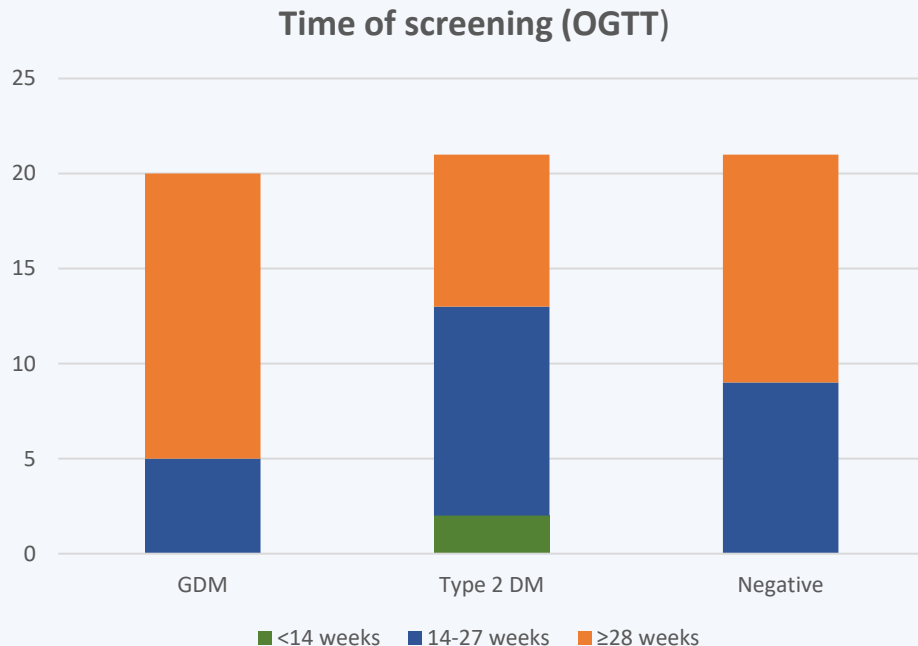
Fasting, 1-hour and 2-hour glucose values by diagnosis group



Measure	GDM (n=20)	DM2 (n=21)	Negative (n=21)
Fasting — Mean	93.5 mg/dL	137.2 mg/dL	81.9 mg/dL
Fasting — SD	±22.2	±43.5	±7.1
Fasting — Range	69–203	69–222	69–114
1-hr — Mean	178mg/dL	238mg/dL	160mg/dL
2-hr — Mean	~198 mg/dl	~230 mg/dl	~130 mg/dl

Gestational Age at Screening

Distribution of OGTT timing across trimesters



1st Trimester

n=2

3.2%

Early detection — high risk patients

2nd Trimester

n=30

48.4%

Guideline-recommended window (24–28w)

3rd Trimester

n=30

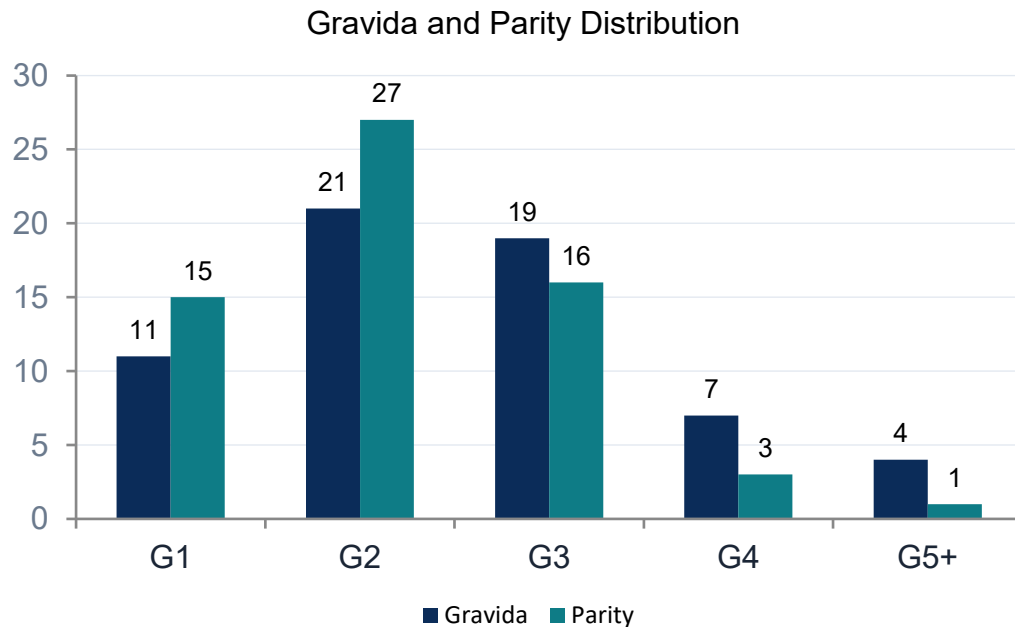
48.4%

Late — still beneficial, not ideal

Mean GA at screening: 27.6 wks (SD ±5.4)

Obstetric History — Gravidity & Parity

Reproductive history of the study cohort



Obstetric Indicators

Primigravida (G1) **11 (17.7%)**

Multigravida (G $\geq$ 2) **51 (82.3%)**

Nulliparous (P0) **15 (24.2%)**

Primiparous (P1) **27 (43.54%)**

Multiparous (P $\geq$ 2) **20 (32.3%)**

Grand multipara (P $\geq$ 4) **1 (1.6%)**

Note: Low documentation of previous GDM/macrosomia may reflect incomplete antenatal records or new diagnoses.

Discussion

Interpreting the NMCHC GDM screening data

Very High Rate of Abnormal Glucose Tolerance

66% of screened patients had GDM or Type 2 DM. This reflects a high-risk referral population but also suggests significant undiagnosed diabetes burden among Cambodian women of reproductive age.

Advanced Age as a Dominant Risk Factor

Mean age was 33.5 years; 93% of patients aged ≥ 35 had abnormal OGTT. This aligns with international evidence that AMA significantly increases insulin resistance and β -cell stress.

High Proportion of Type 2 DM Detected

17 patients (27.4%) met DM thresholds — suggesting pre-existing undiagnosed T2DM. Fasting glucose was markedly elevated (mean 137 mg/dL). These patients need prompt diabetes management, not just GDM care.

Glucosuria as Primary Screening Trigger

Glucosuria was the most frequently documented risk factor. While it has low specificity (~50%), it remains a practical and accessible trigger in resource-limited settings. Standardised multi-factor screening is recommended.

Late Screening — a Missed Opportunity

Only 3.2% were screened in the 1st trimester. With 27.4% having probable pre-existing DM, earlier screening could allow timelier intervention and reduce complications.

Discussion — Regional & International Comparison

Benchmarking NMCHC findings against Iraq, Asian and European studies

Study / Setting	Design (n)	GDM Prevalence	Significant Risk Factors (adjusted)
NMCHC, Cambodia (this study)	High-risk referral cohort (n=62)	66.1% abnormal (32.3% GDM + 33.9% T2DM)	Age ≥35y (93% abnormal); glucosuria (58.5%); hypertension
Majeed et al. 2025, Iraq (attached study)	Cross-sectional, universal OGTT (n=741)	21.1%	Age >35y, aOR 4.77; obesity BMI≥30, aOR 2.23; overweight, aOR 1.6; prior macrosomia, aOR 2.41
Asia pooled meta-analysis (84 studies, BMC 2018)	Systematic review / meta-analysis	11.5% pooled (range 1.5–38.6% by country)	Previous GDM, OR 8.42; macrosomia, OR 4.41; BMI≥25, OR 3.27; family history DM, OR 2.77
Malaysia, national survey (NHMS 2022)	Population-based (2016 vs 2022)	27.1% in 2022 (up from 12.5% in 2016)	Advanced maternal age; high BMI; hypertension
Tokyo, Japan (Sanno Hospital, 2015–2024)	Retrospective cohort (3,177 screened / 11,694 total)	32.3% of screened women	Advanced age; prior GDM; family history DM; higher BMI; elevated HbA1c
Multiethnic European cohort (Austria / Switzerland / Germany)	Prospective cohort	Higher in Asian/MENA-origin women (OR 1.87 vs Caucasian)	Early fasting glucose & insulin resistance; BMI especially significant in Asian-origin mothers

Take-away: Advanced maternal age and elevated BMI are the most reproducible GDM risk factors across Iraqi, Asian, Southeast Asian and European cohorts, despite prevalence ranging 8-fold (11.5% Asia pooled to 66.1% at NMCHC). NMCHC’s high rate reflects a selected high-risk referral population rather than the true community prevalence — consistent with the Iraqi study’s finding that universal OGTT screening is needed because ≈20% of GDM cases have no traditional risk factors.

Take-Home Messages

Clinical recommendations from GDM screening at NMCHC

01 GDM and T2DM are highly prevalent (61%) in high-risk women at NMCHC — universal screening is justified.

02 Advanced maternal age (≥ 35 yrs) is the most significant risk factor: 93% had abnormal OGTT. Prioritise early screening in this group.

03 Over 1 in 4 screened women had pre-existing undiagnosed Type 2 DM. OGTT screening detects beyond GDM — critical for population health.

04 Screening must move earlier: only 3.2% screened before 14 weeks. Guidelines recommend 24–28 wks; high-risk patients should be screened at first visit.

05 Strengthen documentation of risk factors — previous GDM and macrosomia are under-recorded. Better data drives better screening decisions.

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Key guidelines and literature

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THANK YOU FOR YOUR ATTENTION!