មជ្ឈមណ្ឌលជាតិគាំពារមាតា និងទារក
National Maternal and Child Health Center

និទាសល្យសាស្ត្រ សម្ភព និងរោគស្ត្រី លើកទី៤

ប្រធានបទ៖ «ការសិក្សាប្រៀបធៀបទំនើបអំពីជំងឺទឹកនោមផ្អែមប្រភេទទី២ ក្នុងពេលមានផ្ទៃពោះ ក្នុងចំណោមប្រទេសមួយចំនួនក្នុងតំបន់អាស៊ី និងមជ្ឈមណ្ឌលជាតិគាំពារមាតា និងទារក៖ ការគ្រប់គ្រង និងលទ្ធផលដោយប្រើប្រាស់ថ្នាំអាំងស៊ុយលីន ចាប់ពីថ្ងៃទី ០១/០៩/២០២៥ ដល់ថ្ងៃទី ០១/០៥/២០២៦»

A Prospective Comparative Study of Type 2 Diabetes Mellitus in Pregnancy among Selected Asian Countries and NMCHC Cambodia: Management and Outcomes Using Insulin Therapy From "01/09/2025 Till 01/05/2026"

006113

Presented by Dr. SEAK KHANHNA

ថ្ងៃទី២-៣ ខែកញ្ញា ឆ្នាំ២០២៦
មជ្ឈមណ្ឌលជាតិគាំពារមាតា និងទារក

CONTENTS

I- OBJECTIVES

General Objective:

To compare the management and outcomes of insulin therapy in pregnant women with T2DM between selected Asian countries and NMCHC Cambodia.

Specific Objectives:

1. **To describe the socio-demographic of pregnant women with T2DM receiving insulin therapy.**
2. **To assess glycemic control during pregnancy among women treated with insulin therapy.**

3. **To compare maternal outcomes:**

- ❖Preeclampsia
- ❖Cesarean section delivery

4. **To compare fetal outcomes:**

- ❖Birth weight (macrosomia / low birth weight)
- ❖Preterm birth
- ❖Congenital anomalies

II- INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) in pregnancy is increasing rapidly in Asia due to lifestyle changes and genetic predisposition.

- Asia has a unique diabetes phenotype (earlier onset, lower BMI, higher insulin resistance)
- Pregnancy with T2DM is associated with:
  - Maternal complications (preeclampsia, cesarean delivery)
  - Fetal complications (macrosomia, congenital anomalies)

III- STUDY DESIGNS

Type:

- Prospective cohort comparative study
- Study Sites:
  - NMCHC Cambodia and Selected Asian countries (e.g., China, Vietnam, Malaysia, Singapore, Philippines)
- Study Population: Pregnant women with pre-existing Type 2 Diabetes, Receiving insulin therapy during pregnancy.

Inclusion Criteria:	Exclusion Criteria:
❖ Confirmed T2DM before pregnancy ❖ Receiving insulin therapy ❖ Singleton pregnancy	❖ Type 1 diabetes ❖ Gestational diabetes only ❖ Severe comorbidities

IV- DATA COLLECTION METHODS

Data will be collected using:

- ❑Patient interviews
- ❑Medical record review
- ❑Antenatal follow-up
- ❑Laboratory reports (HbA1c, fasting glucose)

V- VARIABLES

Independent Variables:	Dependent Variables:
❑ Insulin regimen (basal, bolus, mixed) ❑ Dosage levels ❑ Country/healthcare settings	❑ Maternal outcomes: ➢ Glycemic control (HbA1c) ➢ Preeclampsia ➢ Mode of delivery ❑ Fetal outcomes: ➢ Birth weight ➢ Gestational age ➢ Congenital anomalies

VI- DATA ANALYSIS

- Descriptive statistics (mean, standard deviation, proportions)

VII- RESULT IN NMCHC

❖During the study period from September 1st, 2025, to May 1st, 2026, a total of 17 pregnant women diagnosed with pre-existing Type 2 Diabetes Mellitus and managed with insulin therapy were identified and enrolled at the National Maternal and Child Health Center (NMCHC), Cambodia.

1- Socio-Demographic Characteristics :

Variable	NMCHC(Cambodia)	Vietnam	Singapore	Malaysia	China	Philippines	Indonesia
Mean age	33.5 years	31.5 y	32.8 y	32.2 y	33.1 y	31.9 y	31.7 y
BMI	28.28 kg/m2	28.3 kg/m2	27.6kg/m2	28.2kg/m2	28.6kg/m2	28.8kg/m2	29.6 kg/m2
Urban residence	76%	70% (N=105/150)	95% (N=133/140)	85% (N=128/150)	88% (N=132/150)	80% (N=112/150)	78% (N=117/150)
Rural residence	24%	30% (N=45/150)	5% (N=7/140)	15% (N=22/150)	12% (N=18/150)	20% (N=28/140)	22% (N=33/150)

2- Glycemic Control during pregnancy among women treated with insulin therapy:

Indicator	NMCHC(Cambodia)	Vietnam	Singapore	Malaysia	China	Philippines
Control	90%	70%	85%	75%	78%	65%
Uncontrol	10%	30%	15%	25%	22%	35%

3- Maternal Outcomes :

Outcome	NMCHC(Cambodia)	Vietnam	Singapore	Malaysia	China	Philippines
Pre-eclampsia	0%	18%	8%	14%	15%	20%
Cesarean section	41.17%	35%	20%	30%	32%	38%
Pre-term birth <37 weeks	5.88%	10%	5%	9%	9%	12%

4- Neonatal Outcomes :

Outcome	NMCHC(Cambodia)	Vietnam	Singapore	Malaysia	China	Philippines
Macrosomia	5.88%	12%	6%	10%	11%	15%
Neonatal hypoglycemia	0%	15%	7%	12%	13%	17%
NICU Admission	5.88%	14%	6%	11%	12%	16%

VIII- DISCUSION OF RESULT

1- Glycemic Control and Outcomes:

- The results show a strong association between glycemic control and pregnancy outcomes. Women with good glycemic control had significantly lower rates of complications compared to those with uncontrolled blood glucose levels.
- This supports the importance of strict monitoring and adjustment of Insulin in managing Type 2 Diabetes Mellitus during pregnancy.

VIII-DISCUSION OF RESULT:

2- Maternal Outcomes:

- The study findings indicate that maternal complications such as **preeclampsia**, and **gestational hypertension** were highest in the **Philippines**, while **Singapore** and **Cambodia** showed the lowest rates.

- The study findings indicate that maternal complications such **cesarean section** were highest in **Cambodia** and **Philippines**, while **Singapore** the lowest rates.

2- Maternal Outcomes: (Continue)

- This variation may be explained by differences in antenatal care quality, early detection of diabetes, and insulin titration protocols. Singapore's well-structured maternal health system ensures tight glycemic monitoring, which reduces complications.
- In contrast, Cambodia and the Philippines may experience delayed diagnosis and limited access to specialized diabetes care.
- These findings are consistent with previous studies indicating that poor glycemic control is strongly associated with increased maternal complications.

3- Neonatal Outcomes:

- Neonatal outcomes such as macrosomia, neonatal hypoglycemia and NICU admission were more frequent in the **Philippines**, and **Vietnam** compared to **Singapore** and **Malaysia** and **Cambodia**.

4- Country Comparison:

- **Singapore** had the best maternal and neonatal outcomes due to advanced healthcare infrastructure and strict diabetes management protocols.

- **Malaysia** and **China** showed moderate outcomes with good urban healthcare but variability in rural areas.

- **Vietnam** showed intermediate outcomes with improved but still developing diabetes care systems.

- **Philippines** and **Cambodia** showed higher complication rates due to limited resources, inconsistent monitoring, and delayed diagnosis.

IX-CONCULSION

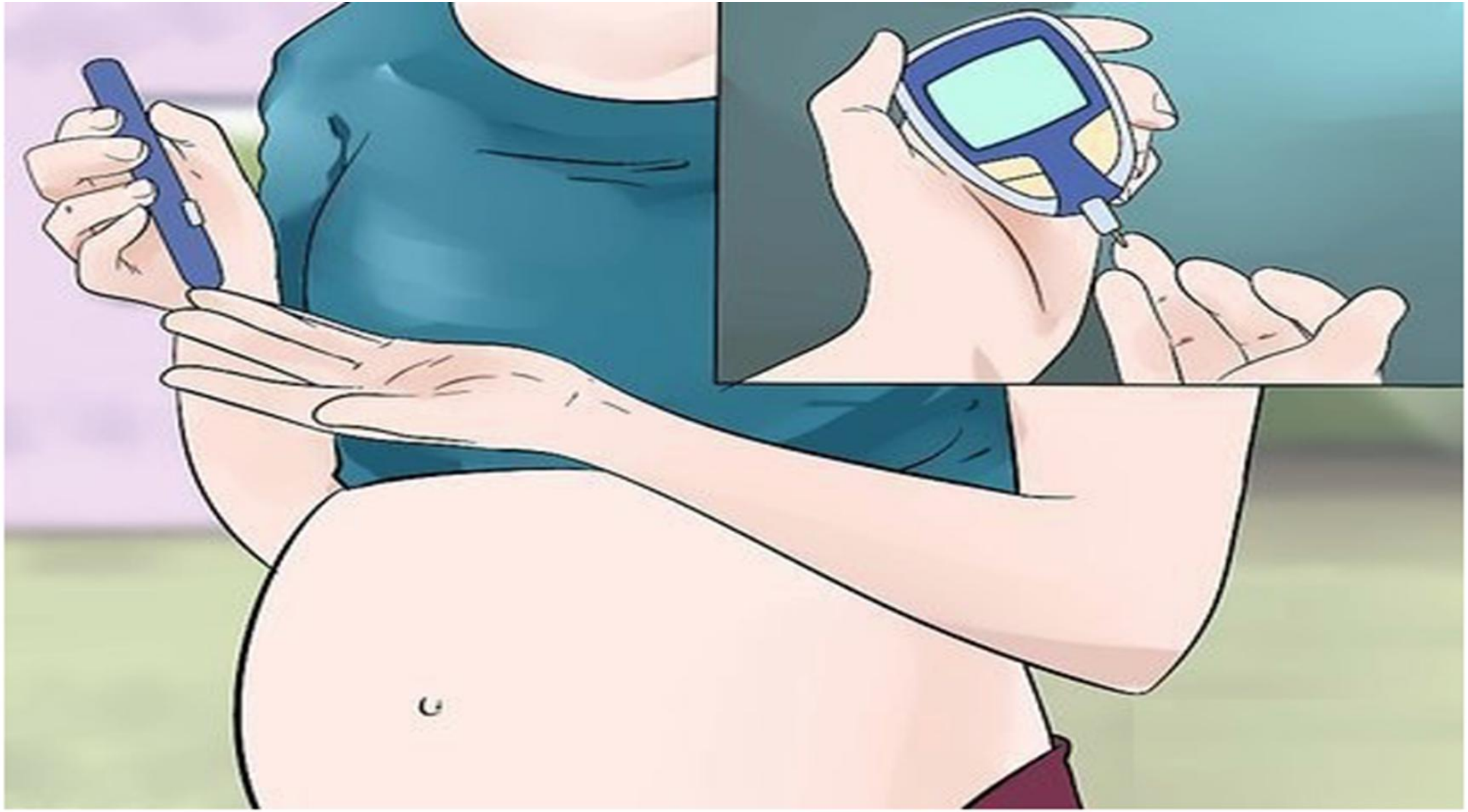
The study confirms that outcomes in Type 2 Diabetes Mellitus during pregnancy vary significantly across countries and are strongly influenced by glycemic control achieved through Insulin therapy and healthcare system strength.

TAKE HOME MESSAGE

- Early identification, effective glycemic control, and appropriate insulin therapy are keys to improving maternal and neonatal outcomes in pregnancies complicated by Type 2 Diabetes Mellitus.
- Healthy mother, healthy baby: Control your blood sugar, attend regular antenatal visits, follow your treatment plan, and work closely with your healthcare team.

REFERENCES

- ADA Standards of Care—Management of Diabetes in Pregnancy (2026)
- WHO Recommendations on Care for Women with Diabetes During Pregnancy (2025)
- NICE Diabetes in Pregnancy Guideline (NG3)
- World Health Organization. WHO recommendations on care for women with diabetes during pregnancy. Geneva: World Health Organization; 2025. Available from: WHO guideline on diabetes during pregnancy.
- Eng PC, Tag WY, Sivaramasubramaniam S, Aung AT, Teoh CL, Zhang HM, et al. Pre-existing diabetes and prediabetes in pregnancy: evaluation on glycaemic control, pregnancy outcomes and clinical gaps. Diabetes Obes Metab. 2026;28(5):4261–4275. doi:10.1111/dom.70619.This Singapore study is especially relevant because most pregnancies in its cohort involved T2DM and it reports glycemic control and pregnancy outcomes.



Thank You