Government of the Republic of Trinidad and Tobago

Ministry of Health

Women's Health

Diabetes Mellitus and Pregnancy:

Clinical Guideline

Directorate of Women's Health
Ministry of Health

Trinidad and Tobago

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Accountability of this Document

This Clinical Guideline was developed by the Directorate of Women's Health, Ministry of Health, Trinidad and Tobago. The Directorate is a unit in the office of the Chief Medical Officer. This guideline seeks to standardize the delivery of Obstetric services at both public and private health care facilities. It was developed based on the Ministry's principles of accessibility, equity, affordability, efficiency, effectiveness and safety.

This Guideline provides updated information which supersedes the advice provided under the heading "Laboratory Investigations- OGTT" in the Ministry of Health's Maternal and Child Health Manual (2015), Page 4.

Control

The senior management including the Chief Executive Officers of the RHAs, Executive Medical Directors, Medical Directors, County Medical Officers of Health, Medical Chiefs of Staff, General Managers of Nursing, Primary Care Managers, and Heads of Departments have the overall responsibility for the dissemination, staff education, implementation of and compliance with this guideline.

Distribution

The guideline is to be distributed to all relevant health facilities where obstetric and midwifery services are provided.

Review Cycle

The Guideline will be reviewed on a three-year cycle and updated where necessary, including at earlier intervals if warranted. Unless recalled by the Ministry of Health, the Guideline will remain in force however.

Earlier versions

Any earlier version of this document should be archived for use by the health facility as a reference document.

Clinical disclaimer

The recommendations in this guideline were arrived at after consideration of the existing evidence available. When exercising their clinical judgement, professionals are expected to take this guideline fully into account, along with the individual needs, preferences and values of their patients or service users. The application of the recommendations in this guideline do not dictate an exclusive course of action as we recognize that individual clinical circumstances may require an individualized approach at times. Major deviations from these recommendations however, are to be documented in the patient's case records including the reason(s) for doing so.

Approval date _____

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Director, Women's Health

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Chief Medical Officer

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Permanent Secretary

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Hon. Minister of Health

Message from the Directorate

The Directorate of Women's Health has been charged with providing a co-ordinated national health team response to issues related to women's health. A standardized clinical management strategy that is based on our experiences and clinical context, is one area that needs further development.

Type 2 Diabetes Mellitus (T2DM) is a major contributor to morbidity and mortality in Trinidad and Tobago. This is linked directly to high rates of obesity in our resident population. Obesity also predisposes to Hyperglycaemia in Pregnancy (HIP) and it is estimated as high as 1 in 5 in the pregnant populace. Hyperglycaemia in pregnancy increases risks to both fetus and mother in short as well as long term.

Early diagnosis and interventions are anticipated to result in significant improvement in these outcomes. Additional benefits include reduced hospitalization, early recognition of chronic diseases and management strategies to reduce complications, less neonatal admissions, greater population awareness of the need for lifestyle modification, and significant economic benefits as the burden of the disease reduces.

New evidence-based guidelines and definitions have been produced based on immediate maternal and fetal outcomes. As new data emerge, criteria for diagnosis and treatment may yet change. This document aims to capture present international recommendations.

All routine antenatal care management guidelines apply including the Maternal and Child Health Manual (MoH, 2015) and the SOP Obstetric and Midwifery Services (MoH, 2011) unless specifically updated in this guideline. These areas are not repeated in this guideline.

Acknowledgements

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The contribution and recommendations from all the other stakeholders are also recognised as well as the professional staff of the Corporate Communications Department of the Ministry of Health.

Dr. Adesh Sirjusingh
Director, Women's Health
October 2018

List of Abbreviations

ASA	Aspirin/Acetylsalicylic acid
BMI	Body Mass Index
CBC	Complete Blood Count
CDAP	Chronic Disease Assistance Program
CTG	Cardiotocograph(y)
DM	Diabetes Mellitus
DIP	Diabetes in Pregnancy
EFW	Estimated Fetal Weight
FIGO	International Federation of Gynecology and Obstetrics
GDM	Gestational Diabetes Mellitus
GFR	Glomerular Filtration Rate
HIP	Hyperglycaemia in Pregnancy
IADPSG	International Association of Diabetes and Pregnancy Study Groups
IDF	International Diabetes Federation
IUCD	Intrauterine Contraceptive Device
LARC	Long Acting Reversible Contraceptive
MoH	Ministry of Health
NICE	National Institute for Health and Care Excellence
OGTT	Oral Glucose Tolerance Test
PAHO	Pan American Health Organization
PPH	Postpartum Haemorrhage
RHA	Regional Health Authority
SMO	Specialist Medical Officer
SOP	Standard Operating Procedure
T1DM	Type 1 Diabetes mellitus
T2DM	Type 2 Diabetes Mellitus
USS	Ultrasound Scan
WHO	World Health Organization

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1.0 Introduction

Hyperglycaemia is likely the most common medical condition women encounter during pregnancy in Trinidad and Tobago. Worldwide, the International Diabetes Federation (IDF) estimates that one in six live births (16.8%) are to women with some form of hyperglycaemia in pregnancy. The majority (84%) is due to gestational diabetes mellitus (GDM) with 16% of these cases due to diabetes in pregnancy (either pre-existing diabetes—type 1 or type 2—which antedates pregnancy or is first identified during testing in the index pregnancy). Estimates of GDM in Trinidad and Tobago are expected to be even higher given the high prevalence of obesity and other susceptibility characteristics of our population.

GDM is associated with a higher incidence of maternal morbidity including caesarean deliveries, shoulder dystocia, birth trauma, hypertensive disorders of pregnancy (including preeclampsia) in the short term as well as development of T2DM and cardiovascular disease for mother in later life. In like manner, perinatal and neonatal morbidities (e.g. macrosomia, birth injury, hypoglycaemia, polycythaemia, and hyperbilirubinemia) also increase. Long-term sequelae in offspring include higher risks for obesity, diabetes and cardiovascular disease later in life.

Medical litigation adds to the economic burden faced by the management of the complications that can arise from DM and pregnancy.

This clinical guideline has been developed as many women are either not screened or improperly screened for diabetes during pregnancy. The Ministry of Health seeks to formalize universal screening for hyperglycaemia in pregnancy as a routine component of the current panel of investigations that is currently offered to our population. The MoH also seeks to introduce screening at the first opportunity regardless of gestation, rather than in the late second trimester based on risk factors, as is currently the practice.

2.0 Summary of recommendations

The Ministry of Health recommends the following strategies:

2.1 Public health priority: The MoH recognizes the links between maternal health and non-communicable diseases on the sustainable developmental goals (SDGs) agenda. Public health measures to increase awareness, access, affordability, and acceptance of preconception counselling, and antenatal and postnatal services for women of reproductive age must be prioritized.

2.2 Universal testing: All pregnant women should be tested for hyperglycaemia during pregnancy using a one-step procedure.

2.3 Criteria for diagnosis: The WHO criteria for diagnosis of diabetes mellitus in pregnancy [1] and the WHO and the International Association of Diabetes in Pregnancy Study Groups (IADPSG) criteria for diagnosis of GDM [1,2] should be used.

2.4 Diagnosis of GDM: Diagnosis should ideally be based on laboratory results of venous serum or plasma samples that are properly collected, transported, and tested. Though plasma calibrated handheld glucometers offer results that are less accurate and precise than those from quality-controlled laboratories, it is acceptable to use such devices for the diagnosis of glucose intolerance in pregnancy in locations only where laboratory support is either unavailable or at a site remote to the point of care.

2.5 Management of GDM: Management should be in accordance with our available national resources and infrastructure.

2.6 Lifestyle management: Nutrition counselling and physical activity should be the primary tools in the management of GDM. Women with GDM must receive practical nutritional education and counselling that will empower them to choose the right quantity and quality of food and level of physical activity. They should be advised repeatedly during pregnancy to continue the same healthy lifestyle after delivery to reduce the risk of future obesity, T2DM, and cardiovascular diseases.

2.7 Pharmacological management: If lifestyle modification alone fails to achieve glucose control, metformin and/or insulin should be considered as treatment options for GDM.

2.8 Postpartum follow-up and linkage to care: Following a pregnancy complicated by GDM, the postpartum period provides an important platform to initiate beneficial health practices for both mother and child to reduce the future burden of several non-communicable diseases. Secondary care teams at the RHAs should establish links with primary care teams, family physicians, internists, pediatricians, and other healthcare providers to support postpartum follow-up of GDM mothers and their children. A follow-up program incorporated into existing child's vaccination and regular health check-up visits provides an opportunity for continued engagement with the high-risk mother and child pair.

2.9 Audit and research: There is need for locally based research on the effects of DM in pregnancy and its short and long term sequelae. The MoH recommends the strengthening of Audit and Research teams at the RHAs and at the Tertiary institutions. Students in these areas should place this area of research on the forefront of their activities. Primary and Secondary Care teams should be actively involved in audit of their clinical practice.

3.0 Preconception care

At every opportunity (e.g. Primary Health Care, Family Planning Clinic, Chronic Disease Clinic) potentially at-risk women should be screened for diabetes, offered contraceptive options and **if a known diabetic, women should be counselled as follows:**

3.1 The need for good glycaemic control prior to conceiving to reduce maternal and fetal complications (though this does not eliminate the chances of these occurring) e.g. miscarriage, congenital malformation, stillbirth, neonatal death.

3.2 Provide education for women and their family members, as well as the public, about diabetes and pregnancy e.g.

- Lifestyle management including diet, body weight and exercise
- Advise weight loss especially in patients with BMI of above 27 kg/m² before conception
- Awareness of hypoglycaemia in pregnancy
- Nausea and vomiting affect blood sugar control
- Risks for large babies, birth trauma, shoulder dystocia and caesarean section
- Recommend diabetic retinopathy assessment before and during pregnancy (see below)
- Recommend diabetic nephropathy assessment before pregnancy
- The importance of maternal blood glucose control during labour and birth and early feeding of the baby, to reduce the risk of neonatal hypoglycaemia
- The possibility of temporary health problems in the baby during the neonatal period, which may require admission to the neonatal unit
- The risk of the baby developing obesity and/or diabetes in later life
- That risks increase with the duration of DM
- Recommend the use of safer medications pre-conception or early conversion to alternatives (e.g. insulin) in the first trimester
- That more health visits and interactions will be required
- Recommend folic acid 5 mg/daily before conceiving and continuing until 12 weeks' gestation
- Recommend calcium and vitamin D supplementation
- Recommend ASA 81 mg from 12 weeks (see below)

3.3 Contraception and planning of pregnancy in patients with DM:

- Avoid unplanned pregnancy
- Use the Medical Eligibility Criteria (2018 Update), for Contraceptive use including the oral contraceptive pill

3.4 Blood sugar control advice:

- Keep HbA1c levels below 6.5%
- Advise against pregnancy if HbA1c above 10%
- Consider metformin as an adjunct or alternative to insulin
- See below for blood sugar control recommendations during pregnancy

3.5 Retinal assessment

- Perform if not done within the past six (6) months
- Use existing imaging methods with mydriasis using tropicamide
- Defer rapid optimisation of blood glucose control until after the retinal assessment

3.6 All women should be offered sexual and reproductive health care counselling e.g. contraceptive options, Pap smears, consider HPV vaccine if eligible, postpartum LARC

4.0 Hyperglycaemia in pregnancy

4.1 Screening and diagnosis:

- Universal screening is recommended
- Screening should NOT be based on risk factors (can miss 50% of cases)
- Glycosuria is not to be used as a screening test
- Screening should be considered at first opportunity (e.g. first trimester when booking blood tests are being done) and repeated at 24-28 weeks if initially normal
- FIGO/IADPSG/WHO/IDF support a one-step approach to test for hyperglycaemia rather than a separate screening test followed by a diagnostic test
- There are accepted alternative screening strategies worldwide including a Fasting Blood sugar in the first trimester, or a full 75 g-OGTT for patients who can tolerate the glucose challenge. Research is ongoing on this topic.
- If diagnosed in the first trimester, it is likely to represent Type 1 or Type 2 diabetes
- The table below shows the reference values for the diagnosis of Diabetes in Pregnancy (DIP) and for Gestational Diabetes (GDM). Once one result is abnormal, the diagnosis can be made.

Table. OGTT criteria for diagnosis of Diabetes Mellitus (WHO, FIGO, IADPSG)

75 G - OGTT	NORMAL	GESTATIONAL DIABETES MELLITUS (GDM)	DIABETES MELLITUS IN PREGNANCY (DIP)
FBS	< 92 mg/dl (5.1 mmol/l)	92 - 125 mg/dl (5.1 - 6.9 mmol/l)	≥126 mg/d (7.0 mmol/l)l
1hr post	<180 mg/dl (10 mmol/l)	≥ 10 mmol/l	
2hr post	<153 mg/dl (8.5 mmol/l)	153 to 199 (8.5 - 11.0 mmol/l)mg/dl	≥ 200 mg/dl (11.1 mmol/l)

4.2 General management plan:

- The role of a multi-disciplinary team approach including the dietitian, diabetes educator, pharmacist and others is recognised where available to assist with management and compliance
- An endocrinologist can be consulted especially for difficult to control cases
- Admit to the Ward if severely elevated blood sugars and /or ketoacidosis symptoms

- Patients suspected of having ketoacidosis should be managed by both medical and obstetric teams
- Lifestyle modification: exercise and dietary counselling
    - Referral to dietitian
    - Women should be advised to choose where possible carbohydrates from low glycaemic index sources, lean protein and polyunsaturated fats
    - Women who are diagnosed with GDM who have pre-pregnancy BMI of >27 kg/m² should be advised on moderate exercise. (NICE, 2015)
    - Advise that regular exercise (e.g. walking for 30 minutes, after meals) helps improve glucose control
    - In-patients should be encouraged to ambulate and exercise as far as possible
- Blood sugar profiles
- Teach woman to do self-testing of capillary glucose and charting
- T1DM and T2DM- baseline HBA1c, and repeat every three months
- T1DM and T2DM- Renal assessment should be done on first contact, once not done in the preceding 12 months, checking creatinine levels/ e-GFR
- Patients are encouraged to chart their meals and blood sugars and share the results and concerns with the healthcare team
- Consider anti-diabetic therapy
    - Metformin can be considered as first-line medical therapy prior to or in conjunction with insulin (see below)

4.3 Oral therapy e.g. Metformin

- Women with GDM should be started on a low dose of metformin initially
- They should use it with meals
- Counselled that it does not cause hypoglycaemia.
- If significantly elevated blood glucose, if metformin is unacceptable or contraindicated, offer insulin
- Other oral antidiabetic is currently not advocated by this guideline

4.4 Insulin Therapy

- There are a variety of insulin options available: choose that which will suit the patient's ability and resources
- Embark on insulin therapy under the supervision of the physician. This can be at the primary care level depending on the patient and the resources available
- Teach woman/partner/family members to administer and store insulin
- Educate family members about treatment and monitor for hypoglycaemia symptoms

The starting dose of insulin is measured based on the patient's pre-pregnant weight. Pre-pregnant weight x 0.6 -0.8 =insulin requirement for that person

5.0 Target blood glucose levels

Women should aim to keep:

- Fasting blood sugar between 65- 95 mg/dl (3.6 mmol/l-5.3 mmol/l)
- 1-hour postprandial below 140 mg/dl (7.8 mmol/l)
- 2-hour postprandial below 120 mg/dl (6.7 mmol/l)
- T1DM should be advised on the risk of hypoglycaemia particularly in the first trimester

6.0 Antenatal

- All routine antenatal care guidelines also apply including the Maternal and Child Health Manual (MoH, 2015) and the SOP Obstetric and Midwifery Services (MoH, 2011) unless specifically updated in this guideline
- Diabetic patients should be managed in conjunction with the Specialist Medical Officer
- Unless contraindicated, T1DM and T2DM should be started on low dose aspirin from 12 weeks e.g. 81 mg daily. Other women with risk factors for development of pre-eclampsia can also be prescribed ASA
- Women with diabetes should be offered a first trimester scan and second trimester anomaly (see USS in Pregnancy Clinical Guideline, MoH draft 2017)
- Include Sexual and Reproductive Health discussion during antenatal period including contraception
- Discuss issues of caesarean section and shoulder dystocia in the antenatal period
- Consider blood sugar profiling. This can be done by a combination of in-patient and out-patient testing
- Women with T1DM are advised to test their blood glucose daily during pregnancy e.g. fasting, pre-meals, 1-hour post meal and bedtime as directed by their healthcare professional
- Diabetic patients can be advised to speak with antenatal nurse or midwife to obtain blood sugar monitor if available through loan program or the CDAP
- T1DM should be offered urinalysis to test for ketonuria if hyperglycaemic or unwell
- Women with T1DM and T2DM should be offered retinal assessment if no assessment is done within the last 12 months. One should be done at first contact with patient during the pregnancy, then at 28 weeks, once normal. If any diabetic retinopathy, repeat assessment should be done at 16-20 weeks
- Diabetic retinopathy should not be considered a contraindication for rapid optimisation of glycaemic control in clinical DM with high HbA1c in early pregnancy
- Diabetic retinopathy should not be considered a contraindication to vaginal birth
- If creatinine is abnormal (>120 mmol/l) or if total protein is >2 g/day, patient should be referred to a nephrologist
- Thromboprophylaxis should be considered in a patient with macro albuminemia (Proteinuria > 5 g/dl)
- Monitor fetal growth and wellbeing. Consider ultrasound for growth in third trimester.

- Consider caesarean section in diabetics with history of shoulder dystocia in previous delivery
- Consider CS if EFW is more than 4 kg
- At weights > 3750 g, the risk of shoulder dystocia increases
- All obstetric teams should be well versed in the management of shoulder dystocia
- Documented team-drills should be conducted at all maternity units every three months
- Consider early delivery in a controlled manner versus allowing to go into spontaneous labour
- Induction of labour if indicated, as per clinical guidelines
- Induction of labour can be planned at 38-39 weeks in well-controlled patients
- Neonatal consultation is recommended during the antenatal period especially if neonatal admission is anticipated
- The use of antenatal steroids, if clinically indicated, is appropriate. This will likely lead to hyperglycaemia, so intensive blood glucose monitoring is required as well as adjustment of medication/insulin dose
- Early delivery may be warranted if clinically indicated but there is an increased risk of respiratory complications

7.0 Intra-partum

- Delivery planning under the guidance of the SMO/Specialist Ob/Gyn
- Delivery planning along with neonatal team
- CTG monitoring during labour
- Adequate hydration
- Large bore cannula
- CBC, Group and cross matching
- Blood sugar monitoring testing and charting every hour
- Maintain steady blood sugars 72-126 mg/dl (4-7 mmol/l)
- Team prepared for possible shoulder dystocia
- Paediatrician alerted beforehand and present at delivery
- Be alert for the potential risk of postpartum haemorrhage (PPH) e.g. polyhydramnios, fetal macrosomia

8.0 Post-partum

- Reduced need for medication, to be done on a phased basis depending on blood sugar monitoring
- Possible increased risk of puerperal sepsis
- Contraceptive advice (effective family planning)
- Consider long acting reversible contraception
- Consider insertion of IUCD within 48 hours of delivery or at Caesarean section (pre-counselled)
- OGTT, 6- 8 weeks post-partum
- Consider annual diabetes screening afterwards
- Continue lifestyle management
- Advise on pre-pregnancy and early antenatal care in future pregnancy.

REFERENCES

[1] World Health Organization. Diagnostic criteria and classification of hyperglycaemia first detected in pregnancy. WHO/NMH/MND/13.2. Geneva: WHO; 2013. http://apps.who.int/iris/bitstream/10665/85975/1/WHO_NMH MND_13.2_eng.pdf

[2] International Association of Diabetes and Pregnancy Study Groups Consensus Panel, Metzger BE, Gabbe SG, Persson B, Buchanan TA, Catalano PA, et al. International association of diabetes and pregnancy study groups recommendations on the diagnosis and classification of hyperglycemia in pregnancy. Diabetes Care 2010;33(3):676–82.

[3] The International Federation of Gynecology and Obstetrics (FIGO) Initiative on gestational diabetes mellitus: A pragmatic guide for diagnosis, management, and care Moshe Hod, Anil Kapur, David A. Sacks, Eran Hadar, Mukesh Agarwal, Gian Carlo Di Renzo, Luis Cabero Roura, Harold David McIntyre, Jessica L. Morris, Hema Divakar. International Journal of Gynecology and Obstetrics 131 S3 (2015) S173–S211

[4] Diabetes in Pregnancy: management from preconception to the postnatal period. NICE guideline [NG3], Updated August 2015. Available from https://www.nice.org.uk/guidance/ng3 , retrieved July 15, 2018.

[5] Medical Eligibility Criteria for Contraceptive Use: A Global Handbook for Providers 2018 Update. Joint Publication of The USAID, johns Hopkins and the WHO. Available from http://fphandbook.org/sites/default/files/global handbook-2018-full-web_0.pdf, retrieved September 9, 2018.

[6] Final Evidence Summary: Other Supporting Document for Low-Dose Aspirin Use for the Prevention of Morbidity and Mortality From Preeclampsia: Preventive Medication. US Preventive Services Task Force. June 30, 2017 update. Available from https://www.uspreventiveservicestaskforce.org/Page/SupportingDoc/low-dose-aspirin-use-for-the prevention-of-morbidity-and-mortality-from-preeclampsia-preventive-medication/final-evidence-summary51 retrieved July 21, 2017.