A SYNTHESIZED HANDBOOK ON GESTATIONAL DIABETES
Dear reader,

This is a synthesized handbook conceived to serve as a tool to health personnel in the screening, proper diagnosis and orientation on the management of gestational diabetes.

The different algorithms used in this handbook are recommendations of the International Association of Diabetes and Pregnancy Study Groups (IADPSG) and are recognized internationally.

We are thankful to the Ministry of health and its experts, the World Diabetes Foundation (WDF), the University of Newcastle for their active involvement in the screening and prevention of gestational diabetes in Cameroon.

Dr. Eugene Sobngwi

Supervisor: Pr. Jean Claude Mbanya

Author: Dr. Eugene Sobngwi

Co-Authors: Dr. Joelle Sobngwi, Dr. Serge Limen, Dr. Jean-Louis Nguewa
### TABLE OF CONTENTS

- Definition of gestational diabetes mellitus ........................................................................... 4
- Prevalence .................................................................................................................................. 4
- What are the problems caused by Gestational Diabetes? (Consequences of gestational diabetes) .................................................................................................................. 4
  - On the mother ......................................................................................................................... 4
  - Step 1 ....................................................................................................................................... 5
  - Step 2 ....................................................................................................................................... 6
- Therapeutic procedures ............................................................................................................. 7
  - Management of diabetes ......................................................................................................... 7
  - Obstetrical management .......................................................................................................... 8
  - Monitoring procedures ........................................................................................................... 8
  - The conduct of delivery .......................................................................................................... 8
  - Anesthesia ............................................................................................................................... 9
- Appendix ..................................................................................................................................... 11
  - Screening procedure of gestational diabetes ........................................................................ 11
  - Oral glucose tolerance test (OGTT) ...................................................................................... 12
**DEFINITION OF GESTATIONAL DIABETES MELLITUS.**

Gestational diabetes mellitus (GDM) is a disorder of glucose tolerance occurring or diagnosed for the first time during pregnancy, irrespective of the required treatment and its outcome after birth.

**PREVALENCE**

The prevalence of GDM varies by population studied. In Cameroon, it varies from 5 to 17% according to a study carried out in 2009.

**WHAT ARE THE PROBLEMS CAUSED BY GESTATIONAL DIABETES? (CONSEQUENCES OF GESTATIONAL DIABETES)**

Gestational diabetes has short and long term consequences on both the mother and child.

**ON THE CHILD**

Short term consequences are macrosomia, intrauterine death, shoulder dystocia, respiratory distress and neonatal metabolic complications (hypoglycemia, hypocalcemia and hyperbilirubinemia in particular).

Long term complications are increased risk of obesity and type 2 diabetes in the absence of preventive measures.

**ON THE MOTHER**

Short term consequences are increased prevalence of high blood pressure during pregnancy and caesarean delivery (NB Diabetes diagnosed in the mother is not in itself an indication for caesarean section).

Mid and long term consequences include the occurrence of type 2 diabetes in 15 to 60% of women who had gestational diabetes; hence the need for these women to be closely monitored six weeks after delivery, then annually, and the early onset of dietary and hygienic guidelines for prevention.
Screening and treating gestational diabetes, monitoring short and long term effects on mothers and children enables early and effective prevention of complications.

**SCREENING STRATEGY**

The diagnosis of gestational diabetes requires fasting blood sugar measurement and if necessary an oral glucose tolerance test according to the algorithm found in the appendix.

*All women should be screened*, not only those with risk factors (age> 35 years, obesity, obstetric history of pre-eclampsia, family history of diabetes, foetal death, macrosomia, malformation). In effect these risk factors are absent in 30-40% of women with gestational diabetes.

*Screening should be conducted between the 24th and 28th week of pregnancy*. Even if the first antenatal consultation is done after the 28th week, screening should still be done. For women who have had gestational diabetes before or a malformed baby or one that exceeded 4kg at birth in a previous pregnancy, *screening should be done during the first antenatal consultation* and should be repeated between the 24th and 28th weeks if negative.

The screening procedure proposed in Cameroon is based on the recommendations of [IADPSG](#)(*,International Association of Diabetes and Pregnancy Study Groups*). It is made up of two steps.

**STEP 1**

- **If fasting blood sugar is <0.80g/l (4.4 mmol/L)**
  - Gestational diabetes is unlikely
  - No specific action to be taken
  - Continue normal monitoring of pregnancy

- **If fasting blood sugar is between 0.80g/l and 0.90g/l (4.4mmol/L and 5.1mmol/L)**
  - It is not possible to conclude at this stage
  - Oral glucose tolerance test (OGTT) or at least a second fasting blood sugar on a different occasion are necessary to decide
  - Begin immediately with dietary and hygienic measures

- **If fasting blood sugar is >0.92g/L**
  - Begin treatment with dietary and hygienic measures and refer to the medical doctor
    - The medical doctor will decide if medication is necessary or not

---

1 Diabetes Care, 2010;33:676–682
**STEP 2**

This step is carried out if fasting blood sugar is between 0.80g/l and 0.92g/l. This relies on the oral glucose tolerance test using 75g of glucose over a period of 2 hours (according to WHO). To maximise proper treatment, it is desirable that the time between screening and OGTT should not exceed 7 days.

**OGTT should be performed in the morning, in a woman who is fasting,** who has not changed her usual eating habits and who is at rest throughout the test period. Fasting blood glucose should be measured just before the beginning of the test, at 60 minutes and 120 minutes after taking 75g of oral glucose. This 75g of glucose corresponds to 250ml of 30% glucose solution.

**NB.** Screening and diagnosis of GDM should not be based on glucose in urine (see algorithm in appendix).
THERAPEUTIC PROCEDURES

MANAGEMENT OF DIABETES.

Prompt management, early and effective treatment with regular monitoring reduces significantly the complications of GDM.

The diagnosis of gestational diabetes should lead to:

- Fasting blood glucose measurements in the morning and 2 h after the beginning of main meals (at least once a week). Any modification in management is based on blood glucose values.
- Regular consultations (initially every week until normalisation of blood glucose, and then every 15 days).
- Glycaemic targets are:
  - Fasting blood glucose <0.95 g/l
  - Blood glucose 2 hours after meals between <1.20 - 1.40 g/l
  - Glycated haemoglobin (HbA1c) ≤ 6.5%

Treatment should always comprise a dietetic prescription for each case after inquiry into the person’s eating habits, taking into consideration the pre-gestational weight, weight gain and abiding to the following principles:

- Availability and accessibility of the recommended food;
- Food should contain 50% of carbohydrates, with preference given to low glycemic index carbohydrates and fibres;
- The total caloric intake should be divided into three meals and two or three snacks;
- The daily caloric intake should depend on targeted weight balance (for instance, it should be reduced in the case of obesity or when weight gain exceeds 1.8kg/month in women of normal weight).
- Emphasis should be laid on reduction in consumption of fats and refined or simple sugar with increase in the consumption of fibres (vegetables).

Treatment with medication should begin:

- Immediately if FBG is greater than 1.30 g/l (7.2 mmol);
- A week or two after proper submission to dietetic prescriptions, confirmed by dietetic investigations and if fasting blood sugar are >0.95g/l and/or blood glucose measured 2 hours after a meal is > 1.40g/l
- And monitored by health personnel qualified for the management of patients with diabetes

The patient must receive adequate therapeutic education to at least achieve the following objectives:

- Proper insulin administration
- Glucose monitoring

- Recognition and correction of hypoglycemia

**NB1.** Insulin therapy should be discontinued at the time of birth. As soon as child birth begins, capillary glucose will be monitored every hour in order to adjust blood sugar levels if necessary.

**NB2.** Patients on insulin should be able to get in touch with the medical team round the clock.

**NB3.** Physical exercise compatible with pregnancy should be encouraged as much as possible. Ideally 3 sessions per week for an average duration of 30 minutes each. It can be swimming and walking.

---

**OBSTETRICAL MANAGEMENT**

---

**MONITORING PROCEDURES**

When glycemic targets are achieved and in the absence of complications, monitoring and delivery require no particular measures.

In other cases monitoring is directly related to the degree of glycemic control and the occurrence of complications. The degree of severity will be evaluated by clinicians and this will determine the frequency of investigations. If complications occur (hypertension, preterm labor, low birth weight), monitoring will be identical to that of complicated pregnancies.

In case of poor glycemic control or suspicion of foetal or maternal complications, it is important to refer the patient to a specialist. It is advisable not to go beyond the **40th week of pregnancy before delivery.**

---

**THE CONDUCT OF DELIVERY**

It is not necessary to alter obstetric procedures if blood sugar is properly controlled and in the absence of complications. **Instant caesarian section because of gestational diabetes is unjustified** (no neonatal benefits, and increased material morbidity).

Preterm delivery is not indicated unless there are additional complications (pre-eclampsia, delayed intrauterine growth, fetal vitality abnormalities). However delivery should take place before the 40th week of pregnancy.
In cases of uncontrolled diabetes and fetal complications (macrosomia), monitoring should be intense and established in a specialized centre. When the baby is due, the delivery procedure depends on the degree of fetal macrosomia:
• The choice of the route of delivery depends on foetal-pelvic confrontation.
• Caution when descent is obstructed at the level of the pelvis major
• Expert obstetrical personnel, presence of a pediatric and anesthesiology team

---

**ANESTHESIA**

---

An anaesthetic consultation should be systematically carried out during the third trimester of pregnancy especially in case of risk of complications. Epidural anesthesia does not present any risk in terms of its technique and indications.

**POSTNATAL MANAGEMENT**

**The newborn**

It is not necessary to automatically transfer these babies to a neonatal unit, except for those with complications such as prematurity, intrauterine growth retardation or very poorly controlled diabetes in the mother.
Feeding should begin as soon as the child is born and if necessary with sugary water. Close monitoring should be done for at least the first 24 hours (risk of Hypoglycemia). In the case of macrosomia or at the appearance of clinical signs, it will be necessary to envisage complementary investigations (serum calcium, whole blood counts, bilirubin).

**The mother**

Breastfeeding should be recommended. It contributes to the restoration of normal glucose tolerance. **Blood glucose monitoring should be maintained for a few days** to ensure restoration to normal glucose levels. In case of persistent hyperglycemia, the possibility of a pre-gestational diabetes revealed by the pregnancy should be stated and appropriate management should be continued or re-established quickly.
It is important to monitor glucose tolerance using oral glucose tolerance test three to six months after childbirth using 75g of glucose.

**Long-term monitoring**

- Annual blood sugar monitoring should be conducted on the mother as well as early screening and treatment in case of future pregnancies.
- Regular monitoring should be done on children and nutritional education given to prevent obesity.
Consultation of a specialist for proper contraception and planification of eventual pregnancies under optimal conditions.
ORAL GLUCOSE TOLERANCE TEST (OGTT)