

Guideline

Guideline for Screening and Diagnosing Gestational Diabetes Mellitus

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Abstract

Gestational diabetes mellitus (GDM) is on the rise, especially with the increase in obesity in childbearing women as well as the rising prevalence of diabetes mellitus type 2. The Maltese gestational women are of no exception especially with an established link to intra-uterine nutritional environment adverse effects as well as to genetic factors.

There is no set international screening strategy for GDM and so diagnosis differs between countries. The most common diagnostic test for GDM is by performing a 75g oral glucose tolerance test (oGTT). Most countries and organizations including the World Health Organization have adopted the International Association of Diabetes and Pregnancy Study Groups (IADPSG) criteria for diagnosing GDM.

Performing a 75g OGTT on all women at risk of GDM is expensive as well as unpleasant for the women. A combination of risk criteria including pre-pregnancy body mass index with random plasma glucose and/or fasting plasma glucose based on Maltese and Mediterranean population studies have shown to be a useful screening tool. This tool would help identify women likely to have an abnormal or normal oGTT without the need to perform an oGTT.

A screening GDM protocol is essential to pick up and manage at an early stage those that are at risk to develop GDM without the need to have an oGTT performed in every pregnant woman. This would result in better perinatal and maternal outcomes.

Keywords

Diabetes, Gestational, guideline, risk factors, diagnosis

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Introduction

Gestational diabetes mellitus (GDM) is defined as either diabetes or glucose intolerance, which is initially recognized during pregnancy.¹

The prevalence of gestational diabetes is on the rise and has been greatly associated with the two current epidemics of type 2 diabetes mellitus and obesity in childbearing women.² Cross-sectional studies conducted on Maltese population suggested that the prevalence based on the WHO criteria was 11.5% in 1983.³⁻⁴ This rate appears to have risen to 15.5% in 2010 using the same diagnostic criteria. This latter rate actually translates to 16.5% using the newly proposed IADPSG diagnostic criteria.⁵

The Mediterranean population has been found to be susceptible to adiposity, making pregnant women more prone to hyperglycemia and development of insulin resistance leading to GDM.⁵ In Malta, GDM prevalence is on the rise especially with the high prevalence of obesity as well as Type 2 Diabetes mellitus.⁴ The high prevalence of obesity and diabetes mellitus in the Maltese population have been linked to intra-uterine nutritional environment adverse effects though genetic factors may also play a part.⁶

Screening for GDM

Screening for gestational diabetes has long become a common investigation performed by obstetricians during pregnancy. Using a risk based screening approach on “historic” and clinical criteria to identify risk pregnant women for GDM has been shown to be inappropriate. Studies performed on Maltese population using a risk factor screening criteria have shown a high specificity and negative predictive value with an overall moderate to low sensitivity and positive predictive value.⁷⁻⁸

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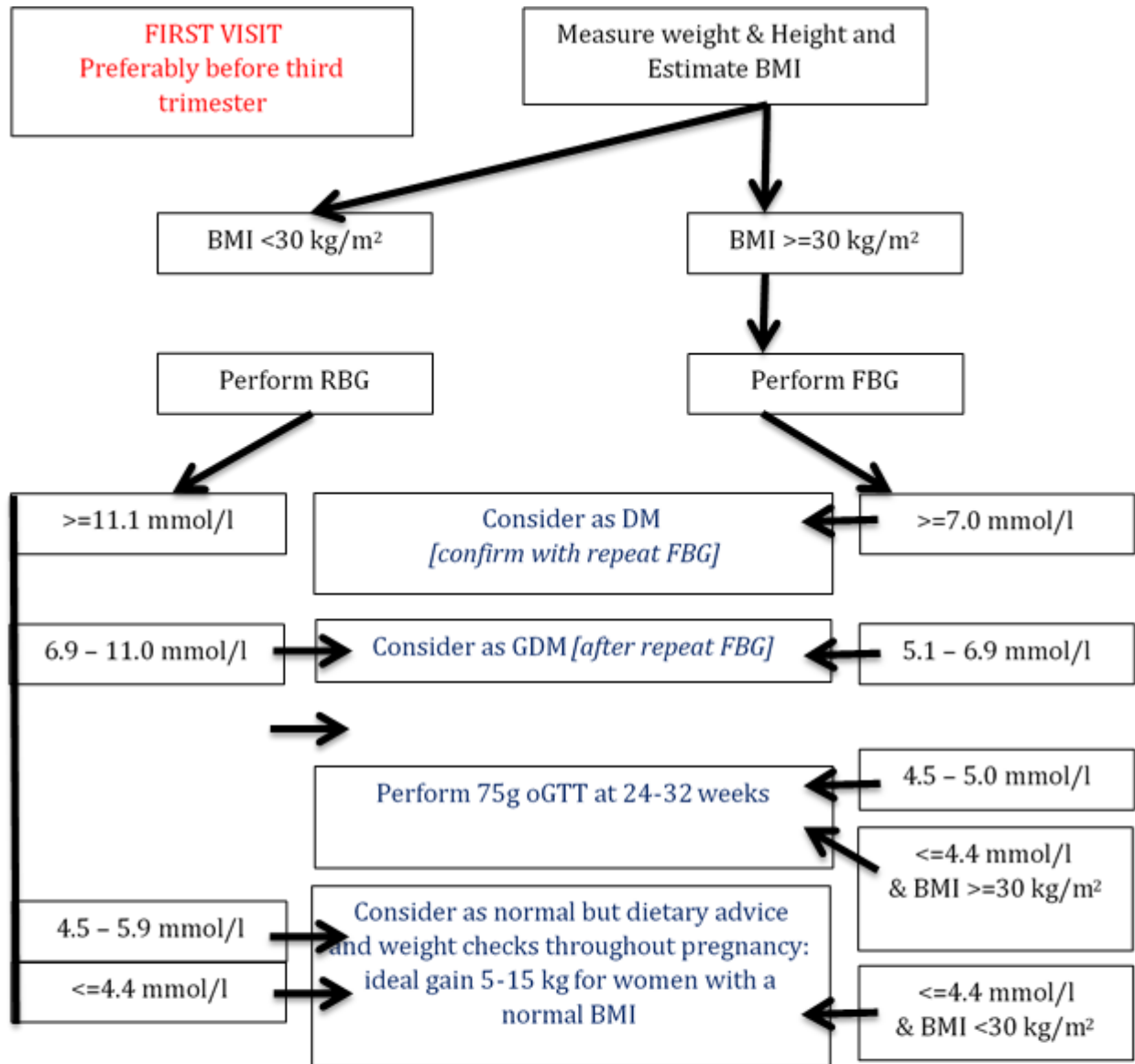
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Figure 1: Screening for diabetes during pregnancy Flow Chart



75gm oGTT diagnostic criteria

	Normal	GDM
Fasting:	≤5.0	≥5.1 mmol/l
1 hour	≤9.9	≥10.0mmol/l
2 hours:	≤8.4	≥8.5 mmol/l

Any one abnormal result

** pre-existing T1DM, T2DM & IGT or women with a past history of GDM should not have an oGTT repeated during pregnancy.*

Diagnostic classification

DM in pregnancy - known cases or elevated RBG ≥11.1 or FBG ≥7.0 mmol/l values

GDM - cases with past history of GDM, FBG ≥5.1 mmol/l; or two abnormal values on oGTT

Gestational Hyperglycaemia - one elevated plasma glucose level on oGTT at 1 hour or two hour endpoints

This was in keeping with other international studies.⁹⁻¹⁰ Therefore, since using risk factor criteria is not an ideal screening tool to identify GDM women, it has been recommended that universal screening with 75g- oral glucose tolerance test (oGTT) should ideally be performed. This may not however be the most cost-effective course of management.⁸ There is no set international screening strategy, so that screening programmes for GDM varies from one country to another.¹¹ In a Mediterranean population, the Mediterranean Group for the Study of Diabetes (MGSD) GDM study has identified that risk criteria showing a huge specificity and specificity and thus useful for screening include an elevated pre-pregnancy or third trimester maternal BMI (>25 and >30 kg/m² respectively), a maternal age greater than 30 years, and a fasting plasma glucose [FBG] ≥ 5.1 mmol/l. All other previously described risk factors were found to be unsuitable with very low sensitivity values.¹² An untimed plasma glucose value of >6.8 mmol/l or <4.5mmol/L may also be a useful screening tool to identify women likely to have an abnormal or normal oGTT.¹³ A proposed screening flowchart is outlined below (Figure 1). This proposed screening programme is based on the IADSG and WHO-2013 proposed cut-off criteria for the oGTT in pregnancy^{1,14} supplemented by the MGSD epidemiological studies related to GDM¹² and studies relating to the use of random plasma glucose [RBG] screening in the Maltese population.¹³ An arbitrary RBG cut-off point of >6.0 mmol/l has been adopted to reduce the number of patients being inconvenienced by being recalled for an FBG.

Diagnostic criteria for GDM

As there is no set international screening strategy, likewise the criteria used to diagnose GDM and the interpretation of the 75g oGTT varies from one country to another.¹¹

The most common GDM diagnostic test to be performed is the oral glucose tolerance test (oGTT), usually performed during the 24 – 28 weeks of gestation.¹⁵ If the mother is considered to be at a high risk to develop GDM, this test may be done much earlier in her pregnancy. Stratification whether the mother is at high risk or not, comes from the first antenatal visit to the obstetrician, where a detailed medical, family and past obstetric history and a physical examination would be performed.¹⁷ A fasting or untimed plasma glucose with or without a glycosated haemoglobin estimation may also be performed to identify early pre-pregnancy undiagnosed diabetic women.

Over the years, different oGTT approaches and thresholds had been established. The 2-step approach takes its origin back to the 1964 O' Sullivan et al. study which has been adapted over the years by different

groups accordingly.¹⁸ This was subsequently adopted and modified by the American Diabetes Association (ADA).¹⁹ Many of the cut-off levels used to define GDM were based on 95% centile values of plasma glucose measures during an oGTT. The HAPO study carried out by the International Association of Diabetes and Pregnancy Study Groups (IADPSG) identified the cut-off criteria by looking at neonatal outcome by glucose values.²⁰ Similar observations have been made in a Mediterranean population. The World Health Organization has now adopted the IADPSG criteria.¹⁴

Conclusions

Screening for GDM is essential since the management of these women has been shown to result in better perinatal and maternal outcomes. Two large randomized interventional trials have confirmed that intervention may reduce the risk for developing fetal overgrowth, shoulder dystocia, hypertensive disorders and caesarean delivery was established.²¹⁻²²

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