Original research article

Prevalence of GDM in antenatal women attending tertiary care hospitals – a prospective study

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ABSTRACT

Introduction: It is clear that India has a very high prevalence of Gestational Diabetes Mellitus(GDM) It is estimated that about 4 million women are affected by GDM in India, at any given time point. the diagnosis of GDM is mainly based on an OGTT between 24 and 28 gestational weeks and therapy typically begins in the third trimester, which may not be early enough for prevention of complications.

Aim: To estimate the prevalence of Gestational Diabetes Mellitus in ante natal mothers attending tertiary care medical college hospitals in Tamilnadu and Pondicherry between January 2018-nov 2018.

Materials and methods: All the antenatal mothers attending ante natal clinics are screened in tertiary care medical colleges in Tamilnadu and Pondicherry between January 2018-nov 2018 are enrolled for the study. Blood sugar estimation on first visit, OGTT at 20 weeks and 24 weeks are tested prevalence calculated, diet and life style modification and importance of exercise emphasized.

Results & conclusion: In our study of 9333 ante natal mothers screened **718** were found having **GDM** prevalence is 7.7% we recommend the screening for GDM is to start with HBA1C test on first consultation or below 18 weeks, and if it is above 5.1, lifestyle modification and exercise and walking, proper, nutritional diet advice to be given and 20 th week non fasting blood sugar and 24 th-28th week OGTT and six weeks after delivery another OGTT will identify and EARLY INTERVENTION will save two generations from diabetes.

INTRODUCTION

Diabetes is a major public health problem in India with prevalence rates reported to be between 4.6% and 14% in urban areas, and 1.7% and 13.2% in rural areas. India has an estimated 62 million people with Type 2 diabetes mellitus (DM); this number is expected to go up to 79.4 million by 2025. Management of diabetes and its complications imposes a huge economic burden on the society; hence effective strategies are urgently needed to control this epidemic. Not surprisingly, in parallel with the increase in diabetes prevalence, there seems to be an increasing prevalence of gestational DM (GDM), that is, diabetes diagnosed during pregnancy. The prevalence of gestational diabetes has been reported to range from 3.8% in Kashmir, 6.2% in Mysore, 9.5% in Western India 17.9% in Tamil Nadu. In more recent studies, using different criteria, prevalence rates as high as 35% from Punjab 41% from Lucknow. The geographical differences in prevalence have been attributed to differences in age and/or socioeconomic status of pregnant women in these regions total number of government

institutional deliveries in Tamilnadu alone:1,81,329 Total number of GDM identified :11,319 PREVALENCE =6.2 % in government institutions alone.

Impact of gestational diabetes mellitus

GDM not only influences immediate maternal (preeclampsia, stillbirths, macrosomia, and need for cesarean section) and neonatal outcomes (hypoglycemia, respiratory distress), but also increases the risk of future Type 2 diabetes in mother as well as the baby.

A recent meta-analysis showed that women with gestational diabetes have a greatly increased risk of developing Type 2 diabetes . In a recent study from North India, women diagnosed to have GDM were subjected to an oral glucose tolerance test 6 weeks after delivery, as per standard recommendations. A disturbingly large proportion of GDM women had some persistent glucose abnormality after birth.

Impaired fasting glucose (IFG) was seen in 14.5% and impaired glucose tolerance (IGT) in 4.8%, 8% had both IFG and IGT, and 6.4% had overt Type 2 diabetes. These figures are a wake-up call to place GDM at the highest priority in our public health system. Global data show that children of mothers with uncontrolled diabetes – either pre existing or originating during pregnancy are four to eight times more likely to develop diabetes in later life compared to their siblings born to the same parents in a non-GDM pregnancy. Interventions during and immediately after pregnancy provide important opportunities to improve the lives of mothers and children today and reducing diabetes in future generations. Screening and appropriate management of diabetes during pregnancy provides a unique opportunity to prevent Type 2 diabetes in two generations. Lack of awareness in society is one of the reasons that GDM is given low priority in public health

delivery system in India.

Much needs to be done to deal with the epidemic of GDM and Type 2 diabetes in India. There is a need for studying outcomes as well as cost-effectiveness of different diagnostic criteria while simultaneously creating social awareness, training manpower, and sensitizing policymakers to make GDM testing and management mandatory during pregnancy It is well-established that treatment of GDM reduces the risk of serious perinatal complications.

In addition, clinical trials now provide evidence for the impact of multiple interventions in preventing the progression to Type 2 diabetes in women with a history of GDM. Both lifestyle modification and pharmacological therapies have been shown to reduce diabetes development by 50% or more. Breastfeeding can also reduce childhood obesity. Despite the widespread agreement among experts about the importance of diagnosing and treating GDM, the degree of glucose intolerance severe enough to warrant treatment in a pregnant woman is fraught with controversies worldwide. Leading international associations have recommended different criteria . The landmark trial hyper glycemia in pregnancy and adverse outcomes (HAPO) highlighted the continuous nature of the association between hyperglycemia and adverse fetal outcomes.

The International Association of Diabetes and Pregnancy Study Groups (IADPSG) decided that a consensus would be required to translate the results of HAPO study into clinical practice. The IADPSG consensus panel decided to use mean values of fasting, 1 h and 2 h blood glucose of all pregnant females as reference and chose to use odds ratio of 1.75 to define the diagnostic cut-offs for GDM, which led to the development of the widely used and accepted IADPSG criteria.

In India, pioneering work by Seshiah *et al*. lead to the adoption of Diabetes in Pregnancy Study Group in India (DIPSI) criteria as the norm to diagnose GDM, The DIPSI recommends a non fasting OGTT based on the belief that fasting OGTT would be logistically difficult in pregnant women in the community as it required them to return to the clinic on a separate day.

The need for a simple screening test for GDM, is undoubtedly important, considering its relevance for the population at large. The evidence base of the DIPSI criteria is a single-center study comparing non fasting OGTT with World Health Organization (WHO) 1999 criteria, showing 100% sensitivity and specificity. Recent studies have questioned the universal validity of DIPSI criteria. Mohan *et al*. compared DIPSI criteria with WHO criteria and IADPSG. Definitions of GDM used in the study are shown in The sensitivity of DIPSI criteria as compared to WHO 1999 and IADPSG criteria was very low and using non-fasting 2 h venous blood glucose more than 70% women with GDM would be misclassified as normal. The sensitivity improved on lowering the cut-offs, but the specificity would be lowered leading to several false positive anxious pregnant women. Another recent hospital-based study from New Delhi showed that using DIPSI criteria 22.36% women less were diagnosed with GDM than if IADPSG criteria were used.

The aforementioned studies emphasize the fact that prevalence data on GDM is profoundly influenced by the criteria used for the diagnosis. It is, therefore, crucial to define "when to treat" not just for clinic based practice, but even more so for facilitating public health policy. This is only possible by conducting a large outcome based study involving multiple centers across India.

Interventions during and immediately after pregnancy provide important opportunities to improve the lives of mothers and children today and reducing diabetes in future generations. Screening and appropriate management of diabetes during pregnancy provides a unique opportunity to prevent Type 2 diabetes in two generations. Lack of awareness in society is one of the reasons that GDM is given low priority in public health delivery system in India.

There is a clear recommendation to screen for GDM in high-risk pregnant women before 24 and 28 gestational weeks in many guidelines:

1. History of GDM or pre-existing diabetes mellitus (DM)
2. Family history of DM (first-degree relative with diabetes or a sister with GDM)
3. Body mass index (BMI) >30 kg/m^2
4. Previous macrosomia (baby with birth weight >4000 g) or a history of stillbirth
5. Polycystic ovary syndrome
6. Medications: corticosteroids, antipsychotics

Summary of information collected at every stage
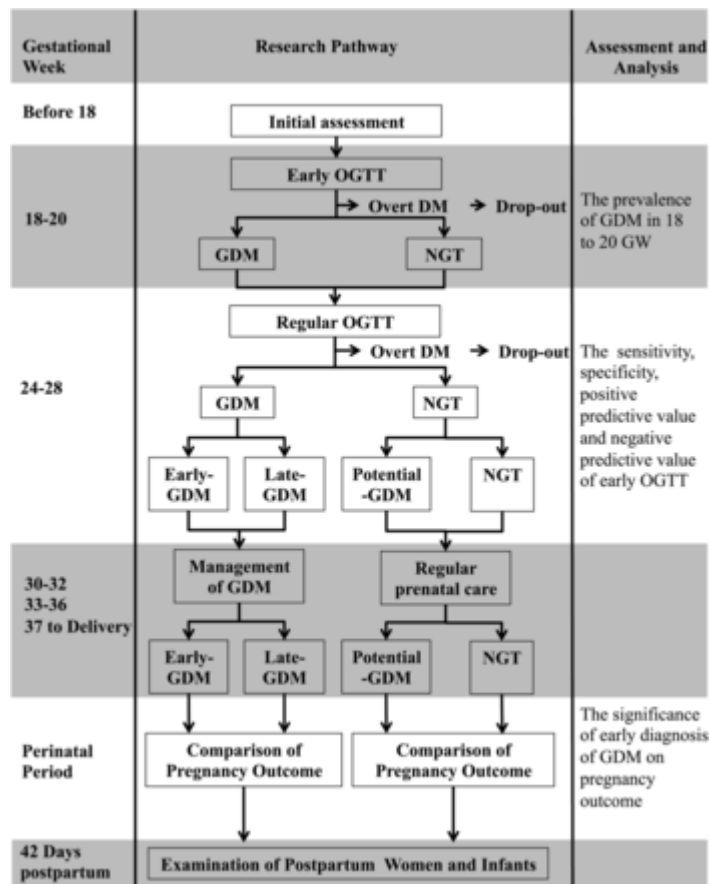
GDM now affects about 17.5% of pregnant women in the population in china and in some parts of India and the prevalence is also increasing in the global population.

Early diagnosis of GDM would play an important role in the prevention of short-term and long-term complications that affect both the mothers and their offspring. However, in current clinical practice, the diagnosis of GDM is mainly based on an OGTT between 24 and 28 gestational weeks and therapy typically begins in the third trimester, which may not be early enough for prevention of complications.

One of the study showed that about two-thirds of pregnant women whose FPG≥6.10 mmol/L at the first prenatal visit would develop GDM, but an OGTT was still recommended at 24–28 gestational weeks. Following this study, they found that the FPG level at the first prenatal visit was associated with neonatal birth weight Recently, they reported that FPG at the first prenatal visit was associated with neonatal birth head circumference and shoulder circumference, These studies demonstrate that although FPG is associated with maternal metabolic disorders and neonatal birth size, a single FPG test is not able to diagnose GDM.

The OGTT is a well-recognised method for the diagnosis of GDM that has been used for more than 50 years. Compared with the original method of O'Sullivan and Mahan, many details have been well investigated and changed to improve the quality of the test , including the use of plasma to replace whole blood, the application of the oxidase method to avoid sample contamination by other substances, a reduction in the amount of glucose required, and the application of 2 hour results to replace 3 hour test results However, the reason for the gestational time point of examination was not clarified.

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Recently, a substantial alteration of OGTT in many guidelines is the reduction of the cut-off value, following the HAPO study. This alteration is due to the consideration of adverse perinatal outcomes that are associated with hyperglycaemia. However, the suggested time point of OGTT in the guidelines has not been moved forward. Considering that hyperglycaemia may exist before 24–28 gestational weeks, and have an adverse impact on the developing fetus, so designed a study to investigate the diagnostic value of an OGTT earlier than the classically tested time period.

In the present protocol, the early OGTT will be performed between 18 and 20 gestational weeks. This selected time period is based on three factors. First, insulin resistance begins during the second trimester, so the time period should be chosen from 13 to 24 gestational weeks. Second, our recent study in a Chinese population showed that pregnant women with GDM had similar FPG between 16–20 and 20–24 gestational weeks. Moreover, a previous study found that only about one-third of mothers with GDM could be diagnosed by OGTT chosen of 16–20 gestational weeks. Third, the reproducibility of OGTT is increased at later gestational ages; thus, we chose 18–20 gestational weeks as the time period of the early OGTT, since it may provide 4–10 additional weeks for the management of GDM with considerable true-positive rate.

In many current guidelines, there is a clear recommendation to perform an OGTT in high-risk women during the first trimester, or as early as the first prenatal visit; therefore, pregnant women with one or more risk factors will be excluded in this study. Guidelines also revealed that there is not enough evidence to screen and treat GDM in low-risk women before 24 gestational weeks; thus, therapy for GDM will be based on the regular OGTT result between 24 and 28 gestational weeks.

In summary, there is currently limited evidence on the most appropriate gestational age for the OGTT. The purpose of this study is to investigate the diagnostic value of an OGTT performed at 18–20 gestational weeks. Pregnant women with GDM may potentially benefit from the result of the study by earlier diagnosis and management of GDM.

Results :

Baseline characteristics of study participants (9333).

Characteristics	Category	Frequency
Age (years)	Below 20	1123
	21-25	1481
	26-30	4388
	Above30	2341
Total deliveries (9333) previous LSCS out of (4653) 2114	Prim	4680
	Second	4329
	More than 2	324
Body Mass Index (kg/m^2)	19-25	4614
	>25	4719
Duration of gestation in weeks	0-12	1653
	12-18	3177

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Characteristics	Category	Frequency
	18-24	4111
	24 and above	392
Working	Yes	4834
	No	4499
Family Type	Nuclear	7699
	Joint	1634
Family Income in rupees	≤ 1,00,000	2859
	>1,00,000	6474
Other Health Problems	Yes	1230
	No	8103

The majority of the study population represents the age group of 26-30years and18-24 category of body mass index each. Likewise, majority 82% falls under nuclear family category . Most of the participants i.e., 69.4% had family income ≤ 1,00,000 and 87% had no other health problems**.**

CONCLUSIONS:

We recommend the screening for GDM is to start with HBA1C test on first consultation or below 18 weeks, and if it is above 5.1, lifestyle modification and exercise and walking, proper, nutritional diet advice to be given and 20th week non fasting blood sugar and 24 th-28th week OGTT will detect GDM in majority of the cases and six weeks after delivery another OGTT will identify any overt DM   and EARLY INTERVENTION will save two generations from diabetes.

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