

# Quaternary prevention and gestational diabetes mellitus

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## INTRODUCTION

Maintenance of health and prevention of ill-health is the core aim of medicine. Equally integral to the philosophy of healthcare is the concept of “*primum non nocere*” or “first do no harm.” To achieve these laudable goals, the World Health Organization provides a comprehensive definition of health, which has remained unchanged for three-quarters of a century.<sup>[1]</sup>

What has changed dramatically, however, over the past few decades, is the profile of disease, and along with it, the structure and style of medical care delivery. One of the major shifts has been the emergence of diabetes mellitus as a global pandemic.<sup>[2]</sup> Within the field of diabetology, gestational diabetes mellitus (GDM) has become a focus of attention.<sup>[3]</sup>

This is attributed to the rapidly increasing prevalence, long-term implications, transgenerational impact, and public health importance of this condition.

## CONCEPT OF QUATERNARY PREVENTION

While this attention is both justified and welcome, it may lead to over enthusiastic screening, unnecessary diagnosis, and unwarranted treatment. Such diagnostic and therapeutic “errors of commission,” or misadventures, are especially of risk in an antenatal setting, where both mother and fetus are exposed to any intervention. These risks can be biomedical or psychosocial in nature. Unwanted hypoglycemia, for example, is a biomedical risk of over-aggressive therapy.<sup>[4]</sup> Anxiety, diabetes distress, social stigma, and financial ill-health are psychosocial adverse effects which may occur unnecessarily.<sup>[5]</sup>

It is to avoid such iatrogenic dangers that the term “quaternary prevention” has been proposed. Also used

to mean “rehabilitation or restoration of function,”<sup>[6]</sup> quaternary prevention (P4) is defined as “action taken to identify patient at risk of over medicalization, to protect him from new medical invasion and to suggest to him interventions, which are ethically acceptable.”<sup>[7]</sup>

Quaternary prevention, in the context of GDM, includes action taken (or action that should be taken) to avoid unnecessary screening, overdiagnosis, inappropriate investigations, and unwarranted therapeutic measures in a healthy antenatal woman. Unfortunately, the GDM landscape, crowded with confusion and conflict in both diagnosis and management,<sup>[8]</sup> is fertile ground for these very phenomena.

Much of this doubt was created by findings of the Hyperglycemia and Adverse Pregnancy Outcome (HAPO) study, which led to formulation of the International Association of Diabetes and Pregnancy Study Groups recommendations on the diagnosis and classification of hyperglycemia in pregnancy. These guidelines were extrapolated to women with gestation <24 weeks, who were not included in HAPO. This led to a tendency to overdiagnose and over-label healthy women with GDM during the first half of pregnancy. Hence, it becomes imperative to analyze current management practices in GDM from a quaternary prevention perspective [Table 1].

## PRAGMATIC APPROACH FOR QUATERNARY PREVENTION

### Frequency of screening

Over-screening is one of the cardinal targets of quaternary prevention. Although universal screening of GDM is widely accepted in India and other high-risk settings, the timing, frequency, and mode of testing is still open to debate.<sup>[8,9]</sup> While glucose estimations are suggested in every trimester, it must be made clear that the first-trimester test is not to screen for GDM every trimester, it must be made clear that the first-trimester test is not to screen for GDM, but to detect preexisting diabetes. At the same time, repeated glucose determinations may be required in select

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**Table 1: Quaternary prevention in gestational diabetes mellitus**

Domain	Issue	Aim of P4
Screening	Method of screening Frequency of screening	Ally apprehension minimize discomfort
Diagnosis	Diagnostic threshold Diagnostic confirmation	Diagnosis should be linked to outcomes
Treatment	Therapeutic threshold Therapeutic intensity	Treatment should not be worse than disease
Follow-up	Frequency of follow-up Duration of follow-up	Balance Life and health care

patients, such as those with unexplained hydramnios or on antenatal corticosteroid therapy.<sup>[10]</sup>

### Mode of screening

The mode of screening is also a matter of controversy. One-step and two-step procedure, 1 h and 2 h postchallenge test, following glucose loads of either 50 g or 75 g, with or without fasting blood glucose estimation, in fasting or nonfasting state:<sup>[11]</sup> various options cause lack of consensus among GDM care providers, and can prevent effective quaternary prevention.

The need for HbA1c as a diagnostic test for GDM, although not endorsed by major opinion-making organizations, has been proposed by commentators as a means of identifying high-risk patients.<sup>[12]</sup> Its use (or misuse), too, must be addressed by quaternary prevention.

### Diagnosis

The diagnostic cutoffs for GDM differ from those of diabetes mellitus and varies according to the screening method used. Use of lower cutoffs has been shown to increase the number of women labeled as having GDM, without causing a meaningful improvement or change in outcomes. On the other hand, use of higher cut-offs may increase specificity while lowering sensitivity to unacceptably low levels.<sup>[8]</sup>

The issue is complicated by discussion surrounding relevance of data from global trials, and single country studies, to multiethnic groups.<sup>[12]</sup> Here, too, the concept of quaternary preventions needs to be invoked to protect patient well-being and outcomes.

### Investigations

A label of GDM is accompanied by the prescription of more frequent health-care visits and investigations, including self-monitoring of blood glucose ultrasonography and cardiotocography, among others.<sup>[13,14]</sup> All these interventions incur a cost, which is financial, physical, and emotional in nature. Visits to the antenatal care provider, diabetes

specialist, and allied medical professionals cost time and money and may necessitate time off from work for both the patient and her attendant. Investigations impose a financial burden and may cause physical discomfort as well, for example, the finger pricks required for glucose monitoring.

### Management

Diagnosis of GDM entails intensive management, which may include lifestyle modification, oral glucose lowering drugs, insulin, and obstetrics-related intervention.<sup>[15]</sup> Such medical “invasion” has the potential for side effects and may sometimes lead to a negative risk: benefit ratio. Management strategies are not limited to the antenatal period; they include care of the neonate, postpartum follow-up of the GDM mother, and long-term surveillance of the child born of a GDM-complicated pregnancy.<sup>[16,17]</sup>

### The ethical tightrope

The concept of quaternary prevention rightly brings focus on a clinical, ethical, and medicolegal dilemma for GDM care providers. What definition of health should be followed while addressing GDM? Should a GDM caregiver hasten to help (*Primum succurrere*) by screening, diagnosing, labeling, and treating as many women as possible, or should she follow the dictum of *primum non nocere* and keep medical intervention (or invasion) to a minimum?<sup>[18]</sup> Should GDM management focus on biomedical attributes such as glucose levels, and exclude psychosocial aspects such as the stress associated with a GDM label? Should short-term maternofetal outcomes take precedence over remotely potential long-term metabolic complications?

## PRAGMATIC APPROACH

There is no single answer to these questions. The GDM care provider shoulders the challenging responsibility of helping the women with GDM decide the optimal course of action though a sensitive phase of life.<sup>[19]</sup> Such a responsibility is best discharged by a process of shared and informed decision-making in a patient centered, family centered, community-oriented, and culturally sensitive manner. This should simultaneously be supported by shared responsibility, including peers from the same specialty, and colleagues from complementary disciplines, including obstetrics, medicine, endocrinology, mental health, and social health.

While medical decisions should be data driven or evidence based. They should be open to modulation by psychological circumstances and sociophysical reality.<sup>[19]</sup> A patient who has a biomedical history suggestive of high risk of GDM, lives within accessible distance of health care, and has no financial constraints, should certainly undergo frequent

screening, as suggested by guidelines. On the other hand, a relatively lower risk subject, who finds it difficult to avail of access, or afford modern health care, may be managed with less frequent investigations.

Once the patient crosses the therapeutic threshold of GDM, a management strategy has to be planned. The initial therapy (medical nutrition therapy [MNT] vs. MNT + oral antidiabetic drugs vs. MNT + insulin) has to be decided, along with the frequency of follow-up and expected line of intensification.

Ideally, these decisions should match pharmacology to pathophysiology while keeping sight of psychosocial limitations and strengths. A medically high-risk patient, who can willingly, and easily, return for frequent antenatal care visits, may be managed with relatively frequent visits and rapid intensification of pharmacological therapy. At the other end of the spectrum, a low risk patient, with weak risk of GDM according to history, low baseline HbA1c/fasting glycemia, inability, or lack of motivation to self-monitoring glucose and/or self-titrate therapy dose, and poor physical, financial, or socially approved access to the health-care system should be prescribed relatively less aggressive therapy with less frequent follow-up.

## SUMMARY

Any “medical invasion,” whether labeling, diagnostic, or therapeutic, should be performed only if the cost-benefit ratio appears favorable. Such action should contribute to achieving better outcomes, both short-term and long-term, in the mother as well as offspring.

If we can ensure this, we will have ensured what we described as the core aim of medicine: Maintenance of health, and prevention of ill-health, in women with GDM.

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Access this article online	
Quick Response Code:	Website: www.ijem.in
	DOI: 10.4103/2230-8210.196021

Cite this article as: Kalra S, Gupta Y, Kalra B. Quaternary prevention and gestational diabetes mellitus. *Indian J Endocr Metab* 2017;21:1-3.