

# VENEZOLAN MANUAL OF GESTATIONAL DIABETES

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## ABSTRACT

*Gestational diabetes mellitus (GDM) is one of the most common metabolic disorders that can affect pregnancy. Its prevalence increases in the same proportion as the obesity and overweight epidemic. Recognizing and treating any degree of glucose alteration that affects pregnancy leads to a decrease in immediate and long-term maternal and fetal complications. Despite a wealth of basic and clinical research, there is still no single approach to diagnosing and treating diabetes during pregnancy. What is desirable for our country is to seek uniform criteria in the investigation and diagnosis of DMG, and in this way, to be able to have our own casuistry. That is why the Venezuelan Society of Endocrinology and Metabolism has conceived the idea of preparing this Gestational Diabetes Manual, with the collaboration of the Society of Obstetrics and Gynecology of Venezuela, the Venezuelan Society of Internal Medicine and Specialists who make up the multidisciplinary team of care for high-risk pregnant women made up of endocrinologists, internists, obstetricians, nutritionists, sports scientists and / or exercise biologists and neonatologists, so that it can be used both at the primary level and in areas of specialization. This manual will focus on the prevention, research, diagnosis, treatment and monitoring of Gestational Diabetes Mellitus, and may serve as the basis for the integration of the health team that is established to care for our patient.*

## INTRODUCTION

Gestational diabetes mellitus (GDM) is one of the most common metabolic disorders that can affect pregnancy.

It increases in the same proportion as the obesity and overweight epidemic that affects the world. Recognizing and treating any degree of glucose alteration that affects pregnancy leads to a decrease in immediate and long-term maternal and fetal complications. These patients face an increased risk of pre eclampsia, premature delivery, fetal malformations, and caesarean sections.

In the future they may present type 2 DM and cardiovascular disease. For their part, children born to these mothers suffer macrosomia and obstetric trauma more frequently, and during birth these infants face an increased risk of hypoglycemia, hypocalcemia, hyperbilirubinemia, respiratory failure, polycythemia and later in adulthood, obesity, DM type 2 heart disease and some cancers 1,2.

Despite a wealth of basic and clinical research, there is still no single approach to diagnosing and treating diabetes during pregnancy. Who, how, and when to screen for and treat diabetes during pregnancy has been debated in the medical literature for decades, and this debate seems endless. Multinational clinical trials that have recruited thousands of patients such as

HAPO (Hyperglycemia Adverse Pregnancy Outcome) have shown how harmful minor changes in blood glucose can be in pregnancy, but still the adoption of new criteria that have emerged from this and others. Similar studies have found resistance. Those who oppose the adoption of these criteria argue that they will increase the incidence of diabetes in pregnancy, which would lead to longer follow-up, and that the cost of healthcare would be higher. 2. What is desirable for our country, it seems that we are seeking uniformity and generalization in the investigation and diagnosis of GDM with criteria based on evidence and not by consensus of experts.

That is why the Venezuelan Society of Endocrinology and Metabolism has conceived the idea of preparing a Gestational Diabetes Manual in collaboration with the Venezuelan Society of Obstetrics and Gynecology, the Venezuelan Society of Internal Medicine and Specialists who make up the multidisciplinary team of care for the high-risk pregnant woman (Endocrinologists, Internists, Obstetricians, Nutritionists, Sports Scientists or Biologists and / or exercise technicians and Neonatologists), so that it can be used both at the primary level and in areas of specialization. This manual will focus on prevention, research, diagnosis and treatment of GDM, as well as immediate and late postpartum follow-up, and may serve as a basis for the integration of the health team that is established to attend to our patient.

## OBJECTIVES

- 1) Promote pre-conception consultation to evaluate and treat the patient's risk factors and thus decrease the morbidity of the future pregnancy of that fetal-maternal union.
- 2) Prepare a survey of risk factors in order to have our own casuistry.
- 3) Support the primary care physician in evaluating his patient, promoting the need for joint work through the patient's timely referral to the multidisciplinary team of specialists.
- 4) Form multidisciplinary teams in outpatients and hospitals to guarantee the best care for

our patients, made up of the internist, the endocrinologist, the nutritionist and the obstetrician, and the neonatologist.

- 5) Promote social awareness of the need for lifestyle changes for the prevention and proper treatment of gestational diabetes and associated diseases in our country.

## DEFINITION OF GESTATIONAL DIABETES

It is an alteration in glucose tolerance of variable severity that begins or is recognized for the first time during an ongoing pregnancy.

## CHANGES IN PREGNANCY

Normal pregnancy is accompanied by significant changes in the mother's energy homeostasis. At the beginning of pregnancy, there is a tendency to increase insulin sensitivity, with decreased fasting plasma glucose levels and a slight decrease in hepatic glucose production. At the end of the first trimester, insulin sensitivity begins to decrease and by the third trimester it is accompanied by a 30% rise in liver secretion of basal glucose and a 40 to 50% decrease in insulin-mediated glucose disposition, which which translates into: lower insulin sensitivity, predisposition to accelerated fasting ketosis and fasting increase in glycemia and maternal free fatty acids. For its part, the beta cells of the pancreas increase its insulin secretion by up to 200%, in order to keep the mother in euglycemia 18. These physiological changes are potentiated by the elevation of various pro diabetogenic and lipolytic hormones such as hormones: Lactogen Placental, Chorionic Gonadotropin, Estradiol, Progesterone, Cortisol, Leptin and Glucagon, together with inflammatory cytokines such as tumor necrosis factor alpha, which change in pregnancy.

Insulin resistance is more pronounced after food intake, in order to guarantee energy supply to the fetus, which favors predisposition to fasting hypoglycemia and ketosis, postprandial hyperglycemia, hyperinsulinemia and insulin resistance in the mother 19. All these physiological changes may not be adequately compensated in some specific groups of women, which translates into

increased risk of developing gestational diabetes 19,20.

It is known today that women who develop GDM have pancreatic beta cells with a defective response in insulin production to hyperglycemia, in addition to having greater insulin resistance than those who do not develop GDM.

Any impediment to insulin sensitivity before pregnancy, added to the physiological adaptation to pregnancy, exerts a significant burden on the  $\beta$  cells of the pancreas, which can promote a serious deterioration of the metabolic situation and therefore cause alterations in the early stages of pregnancy in glucose metabolism. This implies that the severity and gestational week of onset of GDM may be related to a pre-existing background of chronic insulin resistance.

#### **IMPORTANCE OF METABOLIC DISEASES OF PREGNANCY IN FETAL PROGRAMMING**

It is currently known that the expression of inheritance does not depend only on the genetic structure that is inherited in fertilization, but it must be taken into account whether the expression of these genes are silenced (turned off) or activated (turned on), to express themselves in the functional genome of the individual. It has been proven that there are moments of susceptibility where the environment turns off or turns on genes that protect or predispose various metabolic or mental diseases to the future being.

Intrauterine life is a time of great plasticity and sensitivity to activate or deactivate the genes of the fetus, which will produce epigenetic changes that can negatively influence the future health of the individual. The metabolic dysfunctions of women caused during pregnancy such as: diabetes, obesity, malnutrition and / or malnutrition, hypertension, hypothyroidism, alcoholism, smoking, drug abuse and other metabolic, inflammatory and autoimmune diseases, as well as situations of extreme stress, produce epigenetic modifications in fetal life that are expressed late, in childhood or with much greater frequency in adulthood or old age.

This inherited genetic predisposition, associated with the acquired excesses of the environment, has been related to obesity, diabetes, cardiovascular diseases, some cancers of metabolic predisposition such as: breast, prostate, kidney, pancreas, stomach and colon, among others, and produce alterations in the nervous system such as: impaired learning, autism, schizophrenia and early Alzheimer's disease, among others.

In this new context, for the obstetrician and for the team of professionals involved in prenatal and perinatal health, it is a must to think about long-term prevention, achieving as much as possible the best metabolic balance for the mother and fetus during pregnancy; On this, not only the health of the mother and the product at birth depends, but also the genetic susceptibility of the future adult to multiple diseases modulated by the environment. The obstetrician and pediatrician should guide mothers, especially those of these products who have suffered metabolic risks in pregnancy, to avoid environmental damage. It is of great importance to teach these children to eat in a healthy way, to avoid overweight and obesity, and to promote sport and physical activity, to avoid unfavorable interaction: Environment / Heredity / Epigenetics .

Another factor to consider in recent research is the existence of dysbiosis or dysbacteriosis, which are irregularities in the intestinal microbiota, with the consequent low-grade inflammation as an element of obesity and its comorbidities. Gut microbes play an important role in immune and metabolic regulation, which could be used in the nutritional management of pregnant women by probiotic bacteria, modulating specific functions.

Dietary intervention with probiotics can exert clinical effects beyond the nutritional effects of food, and during pregnancy, they can provide an opportunity to promote the health not only of the mother but also of the child.

## PRECONCEPTIONAL CONSULTATION AND MONITORING

Current knowledge justifies carrying out a preconception consultation in order to identify and prevent risk factors related to metabolic complications of pregnancy and its product. It is estimated three months before the pregnancy search with a comprehensive evaluation of the couple. In this consultation, a complete medical history must be made that includes the assessment of risks: demographic, previous gestational history, family history, history of chronic diseases and infections and medications (Annex 1). The importance of prevention and adequate treatment to avoid fetal maternal complications and the future of the new baby should be discussed very carefully with the patient.

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## CONCLUSION

With the increase in obesity, a preconception evaluation is essential to prevent GDM. If this has not been possible, an evaluation should be carried out for its early detection, and in the event of GDM, the patient must be evaluated by a multidisciplinary team with the aim of reducing all maternal-fetal comorbidities. A community education program on lifestyle changes is necessary, based on a healthy diet and exercise. The annexes that we present are in order to facilitate the work of this team and try to have a better casuistry of our population.