

Incidence of Risk Factors on the Onset of Gestational Diabetes Mellitus: An Empirical Research in Southern Italy

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ABSTRACT

In this study the authors evaluated the prevalence of Gestational Diabetes Mellitus (GDM) and the incidence in determining the occurrence thereof, given by the following risk factors: age, family history for Diabetes Mellitus (DM), Body Mass Index (BMI), smoking, diet, macrosomia in previous pregnancies and physical activity. To this end, they investigated a cohort of 61 pregnant women, who had at least one risk factor; in a total period of nine months, during which women checked in the Clinic of Endocrinology and Diabetology of the Hospital "F. Ferrari" in Casarano (Lecce) Italy, and were subjected to an anamnestic investigation and then to a diagnostic test (Oral Glucose Tolerance Test, OGTT 75 g). The anamnesis has allowed to identify the type of risk factors that are present in the population, while the OGTT has allowed to diagnose gestational diabetes. Later, an analysis of the cross-collected data was performed in order to evaluate the percentage incidence of the disease, in relation to risk factors observed. The authors' results confirmed a prevalence of GDM of 26.23% and the existence of a close association between risk factors and GDM. In particular, the risk factors, macrosomia, $BMI \geq 25 \text{ kg/m}^2$, a hypercaloric diet, light physical activity, and age ≥ 35 years, seem to have more influence than smoking and family history for DM, inducing the onset of the illness.

Keywords: *Diabetes/Epidemiology, Gestational Diabetes Mellitus, Oral Glucose Tolerance Test, Pregnancy, Prevalence, Risk Factors, Screening*

DOI: 10.4018/ijmtie.2012070102

INTRODUCTION

Gestational Diabetes Mellitus (GDM) can be defined as a carbohydrate intolerance of variable severity with onset or first recognition during pregnancy (American Diabetes Association, 2002; Metzger et al., 1998; American College of Obstetricians and Gynecologists Committee, 2001; Reece et al., 2002).

This disease is the most common metabolic complication in pregnancy: its prevalence, in the world, is highly variable and depends on the diagnostic criteria used (King, 1998; Ben-Haroush et al., 2004), age of pregnant women, and the possible presence of risk factors before pregnancy.

In the last two decades, the prevalence of GDM has increased significantly (Dabelea et al., 2005; Ferrara, 2007), especially in developing countries and in immigrant populations coming from underdeveloped countries, with a doubling of the incidence rates in all ethnic groups, due to an increase in the sedentary lifestyle, obesity, and the average age of pregnant women (Singh & Rastogi, 2008; Pan et al., 1997).

The GDM is related to an increase in obstetric complications due to excessive fetal growth, such as macrosomia, shoulder dystocia, premature births, and an increased rate of Cesarean sections (Casey et al., 1997; Sendag et al., 2001; Fadl et al., 2010). In addition, this pathology puts women with previous gestational diabetes at high risk of developing Type 2 Diabetes Mellitus and other metabolic alterations, after a few months (Kjos et al., 1990) or a few years (Jovanovic & Pettitt, 2001; Kim et al., 2002; Ratner, 2007).

In this study, we determined the prevalence of GDM in a cohort of pregnant women, already screened by gynecologists and, therefore, with the indication to perform an OGTT (Oral Glucose Tolerance Test). The aim was to investigate the prevalence of risk factors predisposing to this disease and to understand how these factors affect the onset of the disease. In particular, we evaluated the contribution of the following risk factors: age, Diabetes Mellitus (DM) in first degree relatives, smoking, diet, macrosomia

in previous pregnancies, pre-pregnancy Body Mass Index (BMI) and physical activity. Our results could be useful to identify the risk factors on which prevention programs promotion can be based.

Epidemiology

GDM is one of the major complications appearing in pregnancy and occurs with a frequency that varies from country to country. This variability is due both to the different diagnostic criteria used, and the different populations examined. In fact, one of the risk factors that predispose the pregnant woman to the development of GDM is their provenance from certain ethnic groups, such as peoples of South Asia, the Caribbean, and the Middle East (American Diabetes Association, 2012; Bonora et al., 2004; Wong, 2012). However, regardless of ethnic background, GDM is uncommon under 25 years of age, as opposed to 10-20% of women over 35 years developing gestational diabetes. Also numerous epidemiological studies have been performed in Italy. One of the first studies conducted and published in medical literature is that of Scandiano (a small town in the Emilia Romagna region), performed from 1982 to 1991, in which GDM manifested itself with a frequency of 2.2% to 2.3% (Miselli et al., 1994), while in Umbria (Tardioli et al., 1993) and Lombardy (Bonomo et al., 1994), the prevalence was respectively 5.6 and 12.7%. Even in Padua a high prevalence of GDM of 10.8% was recorded (Fedele and Lapolla, 1997). Subsequently, a study was conducted in Tuscany, screening 2750 pregnant women, for which the incidence of GDM was found to be 6.3% (Di Cianni et al., 1998). Recently, a study carried out on the Sardinian population showed a very high prevalence of GDM, around 22.3%, and this figure could be justified by the fact that Sardinia presents a considerable incidence of T1DM (Type 1 Diabetes Mellitus) and T2DM (Type 2 Diabetes Mellitus) (Murgia et al., 2006).

The analysis of the studies reported in the literature, although characterized by a certain variability of the results (probably due to the

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