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Incidence of Gestational Diabetes in General Population

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ABSTRACT A retrospective study of possible risk factors associated with Gestational Diabetes creening was under taken for on 980 mothers between the age group of 20 to and 30 years**.** Women who delivered their babies at the Government Maternity Hospital, Nayapul, and Nilofer Hospital, Red hills, Hyderabad were included in this study. Personal information, medical histories and socio-economic status were examined to identify factors which could increase the risk of GDM. We discovered influencing genetic factors in 2 out of 7patients had genetic factors influencing the cause for GDM women with GDM. All the affected women showed history of intrauterine abnormalities. Interestingly, the predominant Blood Group B in the area was associated with lower risk of GDM. This data conflicts with previous suggestions of higher incidence of Gestational Diabetes in ethnic South Asian populations. A prevalence of 0.71% of GDM in a time period of 7 days, small population size and covering single area is substantially significant. This significant and small-scale study *could* be further validated by a broader study covering a wider ethnic milieu. These seven affected women were also having back ground of lack of education and economic security. The results obtained during the investigation establish the theory which heightens concern that women in developing countries are lacking balanced diet, health and education standards. However, early detection methods may show a higher frequency of GDM. Addressing these issues will be a major step in improving the maternal and fetal outcome for pregnant diabetics in India.

INTRODUCTION

Diabetes mellitus popularly known as Sugar or Type II Diabetes is a disorder that prevents the body from correctly managing blood sugar levels. Gestational diabetes mellitus (GDM) is defined as 'glucose intolerance of variable severity with onset or first recognition during pregnancy' (Metzger, 1991). Normally, the body gets its major source of energy from glucose, a simple sugar that comes from food, high in simple carbohydrates or from breaking down of complex Carbohydrates such as Starches. After sugar and starches are digested in the stomach, they enter the blood stream in the form of glucose. The glucose in the blood stream becomes a potential source of energy for the entire body. But it has to be pumped from the blood into tissues by means of a hormone called *insulin.* The pancreas, a gland that lies behind the stomach, manufactures insulin. Without insulin, glucose cannot get into cells, which is a fuel for the cell and the body. Instead, glucose accumulates in the blood to high levels and is excreted or "spilled" into the urine through kidneys (Henci, 1996; Anne, 1995, 1997).

Gestational diabetes is a high blood sugar condition that some women get during pregnancy. Usually it goes away after the baby is born, unlike other types of diabetes. Gestational diabetes generally starts when the baby is not able to make use of all the required quantity of Insulin needed. Therefore, enough insulin is not consumed by the baby resulting in sugar builds up in the blood to higher level. This phenomena is called hyperglycemia (Henci, 1996; Anne, 1995, 1997).

Gestational diabetes is associated with important prenatal and long-term health risks and many of the risks increases in relation to the severity of maternal hyperglycemia. Women with impaired glucose tolerance in the first few months postpartum are particularly at high risk for diabetes. In some populations, women who have had GDM, comprise a substantial proportion of the over all women population who ultimately develops diabetes. Effective measures to prevent women with GDM from progressing to diabetes could therefore have a significant population health impact (Wah and Byth, 2003)**.** Offspring of women with GDM are at an increased risk for obesity and have unexpectedly high prevalence of elevated glucose levels during childhood and adolescence (Metzger, 199; King, 1998). Both pedigree and intrauterine environmental/ hormonal influences are likely to contribute to these abnormalities (King, 1998; Kuhl, 1998).

The available data suggest that the frequency of diabetes during pregnancy is highly variable and generally reflecting the underlying pattern of NIDDM in the particular population. Different ethnic groups in the same environmental setting, experiences widely variable risk. This includes women of Latino, African American, Native American, Asian, or Pacific Islands, etc descent (Beisher et al., 1991; King, 1998; American Diabetes Association, 2002; Ferrara et al., 2004; Shaat et al., 2004). The worldwide epidemic of glucose intolerance predicted by the latest World Health Organization studies will undoubtedly increase the incidence of GDM, especially in the developing countries.

The purpose of our study was to determine the prevalence of GDM in South Indian population. It is an ethnic group that has been proved to be at larger risk for GDM like South Asian population

MATERIAL AND METHODS

A week's Study at the Antenatal Clinic at The Government Maternity Hospital, Nayapul, Hyderabad and Nilofer Hospital, Red hills, Hyderabad, nine hundred and eighty patients were screened In general the data collected for study were from the women having pregnancy period between 24 and 28 weeks. The information collected for study was: 1. Age 2. Previous history of GDM, 3. History of baby weighing more than 3 kgs, 4. Previous history of foetal death, 5. Family history of Type - II diabetes, 6. Obesity, 7. Hypertension, 8. Dyslipidemia and 9. Consanguinity. All the patients fell between the age group of 20 to 30 years.

RESULTS AND DISCUSSIONS

Worldwide, the incidence of gestational diabetes mellitus is approximately 4% of mothers (Beisher et al., 1991; King, 1998). Approximately 40% of women with GDM during their pregnancy will go on to develop Type II diabetes (Conway, 1999; Schaefer-Graf, 2002). The purpose of this case-study was to determine the prevalence and identify risk factors of GDM in the South Indian population, a subset of the South Asian ethnic group which have been shown to be at high risk (Beisher et al., 1991; King, 1998; American Diabetes Association, 2002).

Among the 980 mothers studied only 7 were diagnosed with GDM (0.71%) and the rate of GDM detected in worldwide women population is 4% every year. Studies conducted by *WHO* and other organizations like *American Diabetes Association Inc* are large scale in terms of number of patients, area covered and the time period. The present study is comparatively smaller. But a prevalence of 0.71% of GDM in a time period of 7 days, in a small population size and covering single area is substantially signi-

Table 1: Information about the patients

Name	*Age (year)*	*Maternal weight (kg)*	*No. of children delivered*	*Age of child at time of study*	*Sex of body*	*No. of previous miscarriages*	*Family history of G.D.M*	*History consanguinity*
Saritha	20	55	1	9-10 days	F	One, 17 weeks	No. couple are HIV +ve	No
Jayalakshmi	22	70	-	-	-	One, 32 weeks	Father, sister, Husband	No
Habeebu-nnisa	30	55	2	20 months 8 months	M F	I. 29 weeks II. 18 weeks	Father, Brother	Yes
Ifakaru-Nnisa	30	65	1	2. ½ years	F	1. 21 weeks	Father, his sisters, Brother	No
Jyothi	26	59	1	3 years	F	1. Trimester II. 25 weeks	No	No
Sara-swathi	32	64	2	7 years 3 years	F F	One,	Father 28 weeks	No
Rajini	28	58	1	5 years	F	One, 28 weeks	Father, sisters, brother	Yes

ficant. This study thus heightens the need for larger population studies in India. It also suggests there might be increasing risk. This case study also helped us to identify the causes of GDM is related with family history (genetic), socio-economic or dietary as opposed to infections, age or weight. 2 out of the 7 affected women (28.6%) had a family history of GDM, which may have influenced their susceptibility (Table 1). Interestingly, all the patients had undergone at least one stillbirth and two of the patients had two stillbirths (Table 1). This shows there was consistent pattern of previous history of miscarriage or stillbirths. This is in agreement with the results of Hedderson et al. (2003) and Wood and Sauve (2003).

This is also in agreement with the two major suggested risk factors (:) viz. family history and previous fetal death, from the WHO (1998) data on GDM. But then none of the patients had any problem of obesity or maternal age. The average age of the women with GDM is 28.85 and the rest of the mothers in this study ranged in between 20 and 30 years of age. When compared to study by Weerasekera (2003) in developing countries, age of mothers did not influence their susceptibility. Obesity or increasing weight has been found to be one of the main reasons for developing GDM in developed or Western countries (Cedergren, 2004). The average weight of the mothers with GDM is 60.85 and of the rest of the mothers taken under this study ranged between 55-65 kg. This suggest both age and weight do not have any influence in developing GDM

A significant observation during the study was the distribution of A, B, 0 and AB blood groupings (O=28.5; A=28.5%, B=14.3, AB= 28.5) in GDM patients. All 7 patients were Rh positive and the least affected group was with blood group B, which is the most prevalent blood group among the South Indian (Asian) population (Garratty et al., 2004).

The results of this study are significant with the frequency of GDM among a small population but contradictory to the blood group analysis data. As the present study was conducted in a small population of South India, further studies with larger populations will provide important validation to these results. All the seven women who were suffering with GDM had very low educational levels and fairly poor economic status. The results obtained during the investigation heightens the theory that women in developing countries are lacking balanced diets, health and education standards. However, early detection methods may show a higher frequency of GDM. (Begum et al., 2002; Ozumba et al., 2004; Samad et al, 1996). However, this indicates that health education and provision of modern affordable methods of management of diagnosed cases, will improve maternal and fetal outcome in pregnant diabetics in India.

GDM not only leads to abnormal glucose tolerance during gestation, but it also means that women later in life are predisposed to develop Type II diabetes (Ben-Haroush et al., 2004). Comparative studies between different racial groups have shown that Indo-Asians show greater intolerance to glucose postpartum. This suggests that Indo-Asian women with GDM should undergo postpartum screening for persistent glucose intolerance (Sinha et al., 2002). Seshiah et al. (2003) in their study in the South Indian population, proposed proper management of diabetes in pregnancy can arrest foetal mortality and morbidity and also better postpartum lifestyle for women.

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