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Suresh Kanakannavar
Associate Professor, Dept. of Obg, Rajiv Gandhi University of Health Sciences, Bmcri, Bangalore, Karnataka, India

Umashankar KM
Assistant Professor, Dept. of Obg, Rajiv Gandhi University of Health Sciences, Bmcri, Bangalore, Karnataka, India

Manuja
Senior Resident, Dept. of Obg, Rajiv Gandhi University of Health Sciences, Bmcri, Bangalore, Karnataka, India

Spandana
Senior Resident, Dept. of Obg, Rajiv Gandhi University of Health Sciences, Bmcri, Bangalore, Karnataka, India

Corresponding Author:
Umashankar KM
Assistant Professor, Dept. of Obg, Rajiv Gandhi University of Health Sciences, Bmcri, Bangalore, Karnataka, India

Maternal and fetal outcome of gestational diabetes mellitus at tertiary care hospital

Suresh Kanakannavar, Umashankar KM, Manuja and Spandana

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Abstract
Introduction: Gestational diabetes mellitus is the development of symptoms and signs of diabetes mellitus during pregnancy and the glucose intolerance reverts to normal during puerperium. Depending on the type of population and the diagnostic criteria used, gestational diabetes is said to complicate 1–16% of all pregnancies.
Materials and Methods: Antenatal mothers both ip and op subjected to glucose tolerence tests between 24 to 32 wksm others with blood glucose greater than 140 mg are followed till delivery and feto maternal outcome analysed.
Aims and Objectives: To Study the Feto Maternal Out Come In Gestational Diaabetis Mellitus
Results: 65% are between 30-39 yrs, 54% were house wifes. 15% had candiadsis, 35% hypertension. Most common indication for caesarian is fetal distress, and second most common was big baby.

Keywords: gestational diabetis, fetal outcome, tertiary care hospital

Introduction

Gestational diabetes mellitus is the development of symptoms and signs of diabetes mellitus during pregnancy and the glucose intolerance reverts to normal during puerperium. Depending on the type of population and the diagnostic criteria used, gestational diabetes is said to complicate 1–16% of all pregnancies [1]. Many researchers in American, European and Asian settings have reported 3–6% prevalence [2, 3, 4]. Compared with white European women, the prevalence rate for GDM is increased approximately eleven fold in women from the Indian subcontinent, eightfold in South - East Asia; six fold and threefold in Arab and black Afro-Caribbean women respectively [5].

Impaired glucose tolerance is usually more prevalent than diabetes in women of child bearing age. Increasing maternal age, overweight, increasing parity and a family history of diabetes are all risk factors for gestational diabetes [6]. The incidence of gestational diabetes is low in absence of risk factors, suggesting that selective screening programs may be cost effective [6]. The worldwide epidemic of glucose intolerance predicted by the latest WHO studies will undoubtedly increase the burden of gestational diabetes, especially in the developing countries [6]. Advocates of universal screening claim that one third to one half of women with gestational diabetes will be missed if the traditional risk factors are used for screening [7].

The WHO expert group recommended that all pregnant women or those with risk factors should be screened at the beginning of third trimester of pregnancy using oral glucose tolerance test (OGTT), that is, blood glucose 2-hr after 75g oral glucose load. This is recommended both for screening and diagnosis [8]. The results are interpreted according to WHO criteria for diabetes.

Pregnancy related morbidity and mortality in gestational diabetes is less than that of overt diabetes mellitus however if not treated it is significantly higher than for non diabetic women [9, 10]. There remains a small increase in unexplained stillbirth in mothers with gestational diabetes. Unlike established diabetes there is no increase in congenital malformation rates since significant maternal hyperglycaemia occurs when organogenesis is complete [10]. There is increased Caesarian section rate because of macrosomic babies and obstructed labour especially in developing countries. There is also associated birth trauma especially when these babies are delivered vaginally [11]. Most studies have found that women with gestational diabetes who develop pregnancy-related hypertension tend to be older and heavier [12].

Glucose tolerance returns to normal in the majority of women with gestational diabetes but one-third to two-thirds of women will have glucose intolerance in subsequent pregnancies [5, 13].

All women with gestational diabetes should have their glucose tolerance reassessed after delivery, and should receive advice and counselling regarding future pregnancies [14]. Clinical features which should alert one to the possibility of type 1 diabetes include; age<30 years, no obesity, first pregnancy and no family history of diabetes [5].

Women with postpartum impaired glucose tolerance should receive dietary advice and be informed of a likelihood of early diabetes. Long-term, it was noted that about 40% of Hispanic-American women with gestational diabetes developed overt diabetes over 6 years [15]. In those women where glucose intolerance persists postpartum, 70% develop frank diabetes. White Europeans, on the other hand, develop diabetes more slowly, that is, 20–40% over 20 years [12].

Materials and Methods

Design

Descriptive observational study.

Setting

All antenatal mothers both ip and op subjected to glucosetolerence tests between 24 to32 wks.

Study population

Women who had come to attend antenatal clinics in department of obg at bowring hospital (Attached to BMCRI).

Sample size calculation

100 GDM mothers are screened between 24 to 32 wks and followed till delivery and feto maternal out come analysed.

Inclusion criteria

Women with singleton pregnancy and gestational age between 24-32 weeks.

Exclusion criteria

Women with diabetes mellitus co-existing with other medical conditions such as sickle cell disease.

Sampling procedure and data collection

All mothers who had come for antenatal clinic and met the inclusion criteria were recruited. Eligible mothers were consecutively recruited until the sample size of 90 was achieved. One of us (O.E) interviewed the mothers using partially coded questionnaires with both open and close ended questions. The mothers were booked for 75gm oral glucose tolerance test during the next visit. They were told not to have breakfast on the day of the test. Each mother's file was marked with a flier for easy identification during the next visit.

The WHO criteria for diagnosis of diabetes using a two-hour 75g oral glucose load and 2 hour post prandial plasma glucose value greater than or equal to 140 mg/dl was used [17].

In the morning of the visit, mothers booked for the test were identified using a flier marked on their files. Their weight and height were taken and recorded.

Blood samples were taken using finger pricks after cleaning the site using 70% alcohol antiseptic. The blood was analysed within 2 minutes using Life scan (One Touch) Glucometer and the results were recorded as fasting blood sugar. Each mother was then given 75g glucose dissolved in a glass of 200ml water to drink and two hours later more capillary whole blood was obtained and analysed in the same way giving results of a 2 hour postprandial capillary whole blood glucose. The results were recorded in the questionnaire forms. The cases were mothers with 2-hour postprandial capillary whole blood glucose levels ≥ 140 mg/dl.

The results of the blood test were made known to the mothers and their implications explained to them. Both the fasting and 2 hour post 75g oral glucose were interpreted using WHO criteria [15]. The mothers with 2-h hyperglycaemia less than 200 mg/dl (11.1mmol/1) were given dietary advice and those with hyperglycaemia greater than 200mg/dl were started on insulin after confirmation of the results with the help of diabetic physicians. The mothers were followed up and encouraged to deliver in same hospital. They were asked to come back for postnatal clinic where they were reviewed and those who had gestational diabetes had an oral glucose tolerance test.

Variables

Social demographic characteristics, pregnancy complications like pre eclampsia, urinary tract infection, candidiasis, fever, hydromnious and intra uterine foetal death, mode and complication of delivery, birth weight, Apgar score, still birth or early neonatal death and congenital abnormality in the babies were recorded. The data collected was coded and fed into a computer using EPI INFO 6.4 statistical package, cleaned and analysed with the assistance of a statistician. Analysis was done using Mantel- Haensel for relative risk with 95% confidence intervals and p values.

Ethical considerations

Permission was obtained from the ethical comitee bmcri Bangalore. Informed consent was obtained from the mothers before interviews were conducted. Use of numbers ensured confidentiality and no names appeared anywhere on the questionnaires.

Results

Socio-demographic characteristics of study subjects.

These are shown in table 1. The age range for mothers with gestational diabetes was 18–39 years with the mean age of 28.6 years. The majority (100%) of mothers were 20–39 years.

Table 1: Socio-demographic characteristics of the mothers

Characteristics		Mothers with GDM %
Age group		
	20 – 29	35(35)
	30 – 39	65 (65)
	40 – 49	0(0.0)
Gravidity	1–4	54(54)
	5.9	46 (46)
Education	None	5(5)
	Primary	45(45)
	Secondary	40(40)
Occupation	Housewife	65(65)

	Self employed	25(25)
	Professional	10(10%)
	Others	0(0.0%)
Body Mass	19 – 25	26(26. %)
Index (BMI)	26 – 30	54(54.7%)
	31 – 40	20(20.0%)
	≥41	0

Table 2: Pregnancy complications of associated with gestational diabetes

Complications	Gestations diabetes %
Hypertension	35(35)
Vaginal Candidiasis	15(15%)
Polyhydromnios	20(20%)
Preterm labour	10(10%)
Abortion	0(0.0%)
Fever	5(5.0%)

Table 3: Indications of Caesarian section in mothers with gestational diabetes

Indications	Gestations diabetes %
Big baby	11(11%)
Fetal distress	12(12%)
Obstructed labour	4(4%)
Poor Obstetric history	3(2%)
Placenta Previa	0(0.0%)
Previous scar	0(0.0%)

Mothers with gestational diabetes were two times more likely to have Caesarean section because of big babies and obstructed labour.

Table 4: Foetal outcomes

Complications	Gestations diabetes %
Normal babies	49(49.0%)
Macrosomia	11(22. %)
Still birth	5(10%)
Shoulder dystocia	7(14.%)
Hypoglycaemia	3(6%)
Trauma/Injury	2(4%)
Congenital abnormality	2(4%)
Cot death	1(2.0%)

Mode of delivery in present pregnancy

Babies born to mothers with gestational diabetes were more likely to be macrosomic, stillborn and have shoulder dystocia than those of normal women ($p< 0.0001$). Complications of hypoglycaemia, trauma to the baby, congenital abnormality of the baby and cot death were other complications of Gdm.

All mothers with gestational diabetes at postnatal visit were screened for diabetes mellitus and were found to be normal.

Discussion

Pregnancy is a diabetogenic state manifested by insulin resistance and hyperglycaemia. The age group at risk of getting gestational diabetes in this study was between 20–39 years in 99.9% of cases. This was similar to other studies where age was equal or more than 25 years and was considered as a high risk for screening [6, 12, 17, 18].

The majority (54.7%) of the mothers with gestational diabetes were of low parity (that is, para 1–4) and only 46% were of high parity (para 5–9). Similar studies have shown that increased parity was less consistently associated with increased risk for developing gestational diabetes mellitus [10].

In this study nearly 74% of mothers with gestational diabetes had a body mass index of greater than 30. This finding confirms the earlier conclusions made by other studies that women who are obese were at high risk of getting gestational diabetes mellitus in pregnancy [6, 12, 17, 18]. Mothers with gestational diabetes mellitus 35,15,20,10 hypertension, candiadsis, polyhydramnias and preterm labor respectively 5% patients had fever. The high body mass index or obesity of women with gestational diabetes predisposed them to hypertension. Most of these patients have chronic or essential hypertension with superimposed pre-eclampsia. It was difficult to establish how many of these women were hypertensive before pregnancy since most of the mothers did not know their pre-pregnancy blood pressure.

The increased incidence of vaginal candidiasis in women with gestational diabetes observed in this study would be explained by the increased spill of sugar in urine thus contaminating the genitalia leading to increased fungal infection. Secondly, diabetic state is generally associated with reduced immunity encouraging opportunistic infections to become prevalent.

Fetal distress and macrosomia are the common causes operative deliveries such as Caesarean sections [11, 20]. In our setting the estimation of foetal weight is done by clinical examination, routine ultrasound for estimation of babies' weight. Inspite of this. Shoulder Dystocia and genital injuries like tears and spontaneous symphysiotomy are noted in the study [11, 12, 21].

Congenital anomalies of babies were observed in the 2 cases in this study sacral myelocele and cleft palate are the anomolies. 5 babies had still birth, 11 macrosomics, 1 cot death, 2 birth injuries and 2 had hypoglycemia [12, 22].

Conclusion

Gestational diabetes mellitus is prevalent in mothers attending antenatal clinics in bowring and lady Curzon hospital and is associated with increased risk of pregnancy and delivery complications. There is need to screen mothers who are at risk of developing gestational diabetes.

Sacral myelocele

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