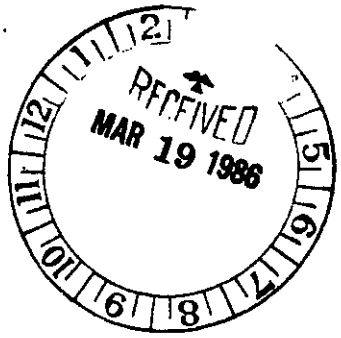

A PRELIMINARY REPORT OF THE INCIDENCE OF GESTATIONAL DIABETES IN A HISPANIC MIGRANT POPULATION

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GESTATIONAL DIABETES MELLITUS

The detection and management of gestational diabetes mellitus, as with most health problems, presents a particular problem among the migrant population. Unfortunately, the current medical literature contains very little research dealing with this population. This paper will present a breif discussion of the problem, along with preliminary results of an ongoing study of the incidence of gestational diabetes.

Gestational diabetes has been defined as an abnormal glucose tolerance which develops during pregnancy and remits after the conclusion of the pregnancy.[1] It is estimated that this condition appears in approximately 2% to 3% of all pregnancies.[2] Maternal diaberes has long been associated with increased neonatal morbidity and mortality including macrosomia, hypoglycemia, hypocalcemia, hyperbilirubinemia and respiratory distress syndrome. Later in infancy and early childhood, delayed intellectual and motor development have been noted. Pettit observed in his study of the Pima Indian population that women with gestational diabetes had ten times the risk of developing overt diabetes later in life than did women with normal pregnancies.[3] Pettit, in a separate study, also observed that the offspring of diabetic pregnancies had three times the incidence of obesity than the offspring of nondiabetic pregnancies.

It has been common practice to screen women for gestational diabetes when certain risk factors are present. The traditional risk factors have included delivery of an infant weighing more than four kilograms, history of fetal loss or neonatal death, previous history of an excessive weight gain and glucosuria during pregnancy. Screening based on monitoring glucosuria has proved notoriously unreliable.[5] Similarly, screening utilizing glycosylated hemoglobins has not proved to be sensitive enough to detect most cases of gestational diabetes.[6,7] In 1973, O'Sullivan et al [2] screened 752 women using a one hour, 50 gram glucose screening test. He also did a formal 3 hour glucose tolerance test on all 752 women, along with a thorough medical and obstetrical history. O'Sullivan documented that utilizing traditional risk factors detected less than half the cases of gestational diabetes, while the one hour screen uncovered 80% of the cases of gestational diabetes. The false megative rate was approximately 1%. (See table 1)

Table 1. Comparison of Glucose Screening Test Outcome and Presence of Gestational Diabetes[2]

Screening Blood Sugar	Number	Gestational Diabetes Present	Gestational Diabetes Absent
Positive	109	15	94
Negative	643	4	639

From O'Sullivan JB[2]

The cost of doing formal 3 hour glucose tolerance tests on all prenatal patients would prove prohibitive to most migrant health centers (average cost $20-$30 per test), more so now given the present funding cutbacks. At Indiana Health Centers - Kokomo, we elected to screen all community and migrant prenatal patients using the one hour, 50 gram glucose screen (average cost $9-$12 per test). From March 1985, until March 1986, there was a total of 99 women screened, 54 from our community population and 45 from our migrant population (100% Hispanic). In each population 6 abnormal screening tests were found. Of these 6, there were 2 positive GTT's in the migrant population (4% of the total screened), while there was only 1 positive GTT in the community population (2% of the total screened). See table 2.

Table 2

	Screening blood sugar	# Abnormal	# Abnormal GTT
Migrant	45	6 (13%)	2 (4%)
Community	54	6 (11%)	1 (2%)
Total	99	12 (12%)	3 (3%)

Screen values greater than 150 mg/dl on the screening test were considered abnormal. The GTT consisted of a 100 gm glucose load after a 12 hour fast. The upper limits of normal were: fasting - 105 mg/dl, two hour - 165 mg/dl, and three hour - 145 mg/dl. Two or more values equal to or greater than these limits were required to make the diagnosis of gestational diabetes.

The two percent of gestational diabetics uncovered in our community population compares favorably to the two percent uncovered by O'Sullivan et al in the 1973 study.[2] The four per cent uncovered in our migrant population would seem to reinforce the view of most migrant clinicians that diabetes mellitus is slightly more frequent in the migrant population. Unfortunately, the sample size in both our populations is relatively small, and until we are able to gather more data, can not be considered to be statistically significant.

This past year, the American College of Obstetricians and Gynecologists, the American Academy of Pediatrics, and the American Diabetes Association sponsored the Second International Workshop-Conference on Gestational Diabetes.[8] This conference unaminously recommended that all pregnant women be screened for glucose intolerance by serum glucose measurement between the 24th and 28th week of pregnancy. They recommended the nonfasting 50gm glucose load with a serum glucose determination one hour later to be used as the standard screen. They also recommended that a serum value of 140 mg/dl or greater be considered abnormal.

The management of the gestational diabetic remains a controversial issue. All experts agree that tight metabolic control and frequent follow-up must be observed. As a general guideline, fasting blood sugars should be maintained between 60-100 mg/dl, and 1-2 hour postprandial levels no higher than 140 mg/dl.[9] Weight gain during pregnancy should be

limited to approximately 25 lbs., the same as the nondiabetic pregnancy. The caloric intake should be limited to 30-35 kcal/kg/day, composed of 18-20% protein, 45% carbohydrates and the balance as fats.[9] The obese gestational nonketotic diabetic can usually be controlled safely with a reduction in calories to 25kcal/kg/day, in the same proportion of protein, carbohydrates and fats.[10] To encourage compliance among the migrant population this diet should be presented with culturally appropriate foods.

Follow-up visits at Indiana Health Center are scheduled every 2 weeks until 28 weeks, weekly until 36 weeks, then semiweekly thereafter. Ideally, every gestational diabetic should be taught home glucose monitoring but practically this is not possible. Alternatively, fasting and 1-2 hour postprandial values should be checked at least every 2 weeks.[11] Patients with fasting values greater than 140 should be considered for insulin treatment. Because of the risk of antibody formation only highly purified non-beef insulin or human insulin should be used. Oral hypoglycemic agents are contraindicated during pregnancy. There have been several studies, notably Coustan and Imarah[11], which suggest the prophylactic insulin treatment of all gestational diabetics significantly decreases the rate of Caesarean section and macrosomia associated birth trauma.

At each visit a urine dipstick for protein, glucose and nitrites should be done, along with monthly urine cultures. This is especially important among the migrant population,

who have a higher documented incidence of urinary tract infections. Fetal monitoring, utilizing nonstress tests (NST) should be done at least weekly after 30 weeks gestation.[5] Golde et al [12] suggest that even more frequent monitoring may be necessary to assure fetal well-being. Their recommendation is that nonstress tests be done on a semiweekly schedule. All nonreactive NST's need to be followed up by a contraction stress test (CST). A NST is considered reactive if there are at least 2 accelerations of the fetal heart rate of 15 bpm, lasting for 15 seconds, within a 20 minute time period. A CST was considered negative if three consecutive contractions in a ten minute period were unassociated with late decelerations of the fetal heart rate.[12] If no spontaneous contractions are evident, a sufficient amount of oxytocin is infused to stimulate contractions. A positive test necessitates delivery of the infant. Ultrasound examinations, when acessible, are helpful earlier in pregnancy to rule out congenital defects and later in pregnancy to date gestations and to assess possible polyhydramnios.

When possible, it is advisable to have a neonatologist or pediatrician present at birth. All infants should be carefully examined for evidence of macrosomia and congenital defects, and a gestational age determination performed. All infants should have a hematocrit, glucose and calcium drawn shortly after birth. Early feedings (½ hour to one hour) should be encouraged for any infant with a glucose less

than 40 mg/dl. Infants who remain hypoglycemic despite early, frequent feedings may need intravenous glucose until the glucose level stabilizes. All infants need to be monitored carefully for signs of hyperbilirubinemia.

Summary

Gestational diabetes mellitus is a serious complication of pregnancy which requires early detection. The increased morbidity and mortality in diabetic pregnancies is well documented. Traditional risk factors have proven to be poor predictors of gestational diabetes. The 50 gram one hour glucose screen as sescribed by O'Sullivan et al has been shown to be an economical but effective screen for gestational diabetes. A study in progress at Indiana Health Center has indicated that the rate of gestational diabetes may be higher among Hispanic migrants than in the general population. Further results will be published when available. It is recommended that all pregnant women receiving care at migrant and community health centers be screened for gestational diabetes between the 24th and 28th week of pregnancy, utilizing the nonfasting 50gm, one hour glucose screen. All values greater than or equal to 140 mg/dl require a 3 hour glucose tolerance test. All women identified by the GTT as being gestational diabetics require frequent office visits with tight metabolic and dietary control, with deference to cultural dietary differences.

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