APPENDIX J

Gestational Diabetes

Gestational Diabetes

Gestational diabetes or pregnancy-induced glucose intolerance is the development of diabetes during pregnancy, which resolves following delivery.

There can be serious effects if the diabetes is not recognized and treated. Urinary tract infections are more common in diabetics because more glucose is filtered due to their increased glomerular filtration rate. Glycosuria predisposes to bacterial infection. (Rosenn & Miodovnik, 2000) Diabetics also have a predisposition to hypertension in pregnancy. (Roach, Hin, Tam, et. al., 2000) Ten percent of diabetics have hydramnios. The reason is poorly understood, but is explained as caused by fetal glycosuria. The urine in amniotic fluid attracts water to balance the high osmolarity of the fluid. (Uvena-Celebrezze & Catalano, 2000) The fetus who remains in an environment of maternal hyperglycemia may demonstrate macrosomia, teratogenesis, or death. The macrosomia is a result of the accelerated fetal growth that occurs when the mother has poorly controlled diabetes. (Langer, 2000; Uvena-Celebrezze & Catalano, 2000) Significant hyperglycemia can lead to ketoacidosis and to movement of ketones across the placental membrane. Elevated ketones have been associated with structural limb defects, cardiac anomalies, early pregnancy loss, and stillborn. Neonates of women with gestational diabetes have more problems with hypoglycemia, hypocalcemia, polycythemia, and hyperbilirubinemia. (Uvena-Celebrezze & Catalano, 2000)

The woman may remain asymptomatic throughout the pregnancy or have subtle clinical signs. Clinical signs are fundal height greater than expected, signs of hydramnios such as tympanic, tight abdomen, excessive maternal weight gain, and glycosuria.

Prompt identification and treatment of these women is important for both mother and infant health. The key to treatment of these women is control of blood sugar within strict parameters. Several tests may be done throughout the pregnancy to provide information about maternal and fetal health. Women are usually seen weekly to assess glucose levels using a fasting blood glucose with a two-hour post-prandial. Other clinics teach clients home glucose monitoring, which may be ordered two to four times a day, daily, or intermittently throughout the week. The glycosylated hemoglobin A1c (HbA1c) test measures glucose saturation of red blood cells, that is, the amount of glucose that will last the cell's lifetime. The test reflects serum glucose levels over the previous four to six weeks. The test is only useful in evaluating past glucose control and client compliance but not weekly surveillance. Routine urine screening is necessary to screen for urinary tract infections, but not useful to monitor the diabetes because the test is unreliable and frequently positive in normal pregnant women. Sonograms and nonstress tests may be ordered to assess fetal well-being.

All pregnant women should be screened either through assessment of high-risk factors, patient history, or laboratory screening for glucose tolerance. (ACOG Practice Bulletin, 2001)

The first step is to identify the population at risk. The client's history may suggest gestational diabetes and warrant screening in the early second trimester at 18-20 weeks. Some clinicians have suggested screening women at high risk for GD at the initial prenatal visit, but this is controversial and has not been a reliable detection of GD.

High-risk historical factors:

- Family history of diabetes
- Poor obstetrical history such as unexplained stillbirths or spontaneous abortions
- Previous unexplained birth of preterm or low birth-weight infant
- Previous newborn weighing 4,000 g or more
- Previous infant with a major congenital anomaly
- Previous history of gestational diabetes

High-risk pregnancy factors:

- Maternal age more than 25 years
- Maternal obesity (weight more than 200 pounds) or body mass index greater than 25
- Recurrent monilial vaginitis
- Glycosuria determined with urine dipstick on two consecutive occasions
- Hydramnios
- Excessive weight gain or fundal height greater than expected, or both

Universal screening of all pregnant women has not shown to be justified because interview screening of high-risk women will identify most of the affected women. (Coustan, 2000) The American Diabetes Association, ACOG, and the Fourth International Workshop Conference on Gestational Diabetes recommend screening of risk groups. In actual practice, most private physicians and academic centers practice universal screening. (ACOG Practice Bulletin, 2001) Universal screening is practiced at the Virginia Department of Health. A reliable, specific, and cost effective screening for gestational diabetes is the 1-hour post-50-g glucola plasma screen. Optimal time to do the plasma screen is between 26-28 weeks of gestation. (ACOG Practice Bulletin, 2001)

If the 1-hour plasma glucola is between 130 – 140 mg/dl, the client should undergo a 3-hour glucose tolerance test (GTT) to establish the diagnosis. In clients with a 1-hour glucola screen above 185-190 mg/dl, the glucose tolerance test is unnecessary. Some experts suggest that treatment should be initiated immediately without performing the GTT. Other experts suggest performing a fasting blood glucose, and if that level is 105 mg/dl or greater, treat the woman for gestational diabetes. Two elevated values on the 3-hour GTT are diagnostic of gestational diabetes. There is recent consideration for lowering the criteria values for diagnosis but consensus does not exist at present. If one value is elevated, the 1-hour glucola should be repeated at 32-34 weeks.

The client diagnosed with gestational diabetes is considered high-risk and should be followed appropriately in the health department. Nutrition counseling is recommended. Arrangements to care for these patients should be determined locally as other high-risk patients.

Treatment for gestational diabetes includes diet and insulin, if necessary. Most oral hypoglycemic agents have historically been associated with teratogenesis, and their use has not been recommended in pregnancy. Some researchers are evaluating the usefulness of some of the newer oral hypoglycemic agents. There are some promising results using these agents. Metformin, which has been used for the treatment of polycystic ovarian syndrome has increased ovulation and resulted in fertilization and birth without teratogenesis. Use of some of these newer agents may become common. (Glueck, Wang, Goldenberg, & Sieve-Smith, 2002)

Postpartum

The gestational diabetic woman who was taking insulin therapy will not need to continue. She should be screened with a 100g five-hour glucose tolerance test at the six-week postpartum exam to assess for underlying diabetes. (MacNeill, Dodds, Hamilton, et.al., 2001) A significant number of these women will later be diagnosed with Type 2 diabetes. This can be an opportunity to counsel the woman regarding lifestyle changes, which could delay or prevent the development of diabetes.

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