

DIET AND EXERCISE AMONG PREGNANT MOTHERS WITH GESTATIONAL DIABETES MELLITUS (GDM)

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ABSTRACT

Diabetes is now emerging as a king of all diseases for the reasons, i.e. multi system involvement, complex metabolic abnormalities and varied clinical presentations. Diabetes causes substantial morbidity and mortality primarily through cardiovascular, eye, kidney diseases. More than 80% of persons with diabetes will be found in the developing countries.

Keywords: Gestational Diabetes Mellitus, Diet, Exercise, Pregnant Mothers, Antenatal exercises.

Introduction

Diabetes is now emerging as a king of all diseases for the reasons, i.e. multi system involvement, complex metabolic abnormalities and varied clinical presentations. Diabetes causes substantial morbidity and mortality primarily through cardiovascular, eye, kidney diseases. More than 80% of persons with diabetes will be found in the developing countries. Diabetes mellitus is a chronic metabolic disorder due to either insulin deficiency or due to peripheral tissue resistance due to the action of insulin. Abnormal carbohydrate tolerance with onset or first detected during the present pregnancy is Gestational Diabetes Mellitus.

Gestational Diabetes

It develops during pregnancy and may disappear after delivery, it occurs in later life. Raised plasma glucose levels during pregnancy predispose to the birth of large birth-rate and still born babies / deaths shortly after birth.

Definition

It is defined as, "carbohydrate intolerance of variable severity with onset or first recognition during the present pregnancy.

Incidence

It occurs 2% to 6% of all pregnant women and accounts for 90% of cases of diabetes during pregnancy. Black race have more risk factors than white race people.

- In Caucasians 1 – 2%
- Afro caribbeans 2 – 3%
- Asians 4-5%

Risk Factors

- Obesity, prepregnancy weight more than 20% over ideal weight.
- Family history of diabetes
- Family history of macrosomia
- previous poor obstetric history
 - Birth of infant weighing more than 9 pounds
 - Hydramnios or unexplained still birth.
 - Miscarriage
 - Infant with congenital abnormalities

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- Ethnic groups (Asians/Hispanics/African/ American)
- Maternal age greater than 30 years
- BMI greater than 27 kg/m²
- DM affecting a first degree relative.

Causes

- Chronic illness such as pancreatitis / cystic fibrosis
- Prolonged use of some drugs e.g. steroids, diuretics.
- Pancreatic trauma
- Certain genetic defects
- Endocrine disorders

Clinical Manifestation

- Weakness
- Premature atherosclerosis
- Retinopathy
- Nephropathy
- Neuropathy
- 3 'p's
 - Polyphagia – excessive hunger
 - Polyurea – excessive urination
 - Polydypsia – excessive thirst

Screening Test

According to American diabetes association the screening of diabetes of all pregnant women between 24 – 28 weeks of gestation

- **Low Risk:** Blood glucose testing is not routinely required.
- **Average Risk:** Perform Screening test.
- **High Risk:** Blood glucose test.

Procedure

50 gm oral glucose tolerance test without regard to time of day / last meal, between 24-28 weeks of pregnancy. The main screening test of Gestational Diabetes is glucose tolerance test.

Complications

- **During Maternal**
 - Abortion
 - Preterm labour (20%)
 - Infection
 - Increased incidence of pre-eclampsia (25%)
 - Polyhydramnions (25-50%)
 - Maternal distress
 - Diabetic retinopathy
 - Diabetic nephropathy
 - Ketoacidosis
- **During Labour**
 - Prolongation of labour due to big baby.
 - Shoulder dystocia
 - Perineal injuries
 - Postpartum haemorrhage
 - Operative interference

- **Foetal Hazards**
 - Foetal Macrosomia (30-40%)
 - Congenital Malformation (6-10%)

Management

- **Diet**

Gestational Diabetes mothers need adequate nutritious mothers to help for growth and development of foetus.

 - Restriction of diet, exercise with or without insulin.
 - Diet with 2000-2500 kcal per day for normal weight woman.
 - Restriction to 1200-1800 kcal / day for overweight woman.
 - Dietary goal is to prevent ketoacidosis and to minimize widely fluctuating blood glucose level.
 - The ratio of carbohydrate / protein / fat is important to meet the metabolic needs of the women and the foetus.
 - The diet should be distributed among 3 meals and atleast 2 snacks.
 - In the diet prescription for Gestational Diabetes mother's following are the important considerations:
 - Calorie needs
 - Proportions of fats, proteins and carbohydrates in the diet.
- **Diabetic Diet**
 - **Bread and Chapattis:** One bread slice provides approximately 75k cal and a thin wheat chapatti provides 40k cal.
 - **Rice:** In a diabetic mother who is underweight rice can be given every day. Four table spoons cooked rice gives 100 k cal.
 - **Pulses, dried peas and beans:** This supplies protein in vegetarian so should be eaten. 1 cup thin dal, pea or bean gives 100 k cal.
 - **Meat:** It is also a protein rich food. One plate of lean meat or fish or chicken provides 100 k cal. Red meat should be avoided.
 - **Eggs:** They are excellent foods. One egg provides 50-80 k cal. Raw or cooked a can be taken.
 - **Milk & Milk Product:** These provide necessary proteins in vegetarian diet. Two teaspoons skimmed milk powder provides 100 kcal.
- **Soups:** Thin soups of vegetables or meat can be taken in any amount as they have low calorie content. But thick soups should be avoided.
- **Vegetables:** Vegetables provide low calorie advised to take more vegetables. Green leafy vegetables can be eaten freely. (Spinach, cabbage, pumpkin, lady's fingers, French beans etc.)Vegetables salads can also be taken liberally so only potatoes and sweet potatoes supply larger amount of calories. So their quantity should be restricted.
- **Fat for Cooking:** Ghee, butter, oil anything can be used but it should use in restricted amount. Gestational Diabetes with normal weight can use two teaspoons / meal. If she is obese one teaspoon / meal
- **Sugar, Jaggery, Honey:** These are pure carbohydrate food and give 20 kcal per teaspoon.
- **Jam, Pastries, Biscuits:** These should be avoided because of their high content of sugar and fat.
- **Fruits:** Banana and mango contain high calories so it is better to avoid. Other fruits such as apple, sweet lemon, guava, water melon can be taken two to three times daily.
- **Papad, Chutney:** These should be taken in minimum quantities. Pickles prepared in oil are not permitted.
- **Beverages:** Tea, Coffee without sugar is permitted.

Daily Menu for Gestational Diabetic Mother

Vegetarian	Non-vegetarian
Morning	
Tea or coffee (without sugar)	Tea or coffee (without sugar)
Breakfast	
Corn flakes with milk Cheese Toast with butter Tea or coffee	Corn flakes with milk Boiled egg Toast with butter Tea or coffee
Mid-morning	
Tea or coffee (without sugar)	Tea or coffee (without sugar)
Lunch	
Cooked rice or chappati or bread Cooked dhal Vegetable soup Papad Curds Roasted groundnut or cashewnut Fruit (half apple or one slice of papaya or mango)	Cooked rice or chappati or bread Cooked dhal Mutton or fish curry Papad Curds Roasted groundnut or cashewnut Fruit (half apple or one slice of papaya or mango)
Tea	
Salt biscuits Roasted nuts Tea or coffee (without sugar)	Salt biscuits Roasted nuts Tea or coffee (without sugar)
Dinner	
Similar to Lunch	

Foods that Control Gestational Diabetes

- **Bitter Gourd:** It is firm like a cucumber and tastes very bitter.
- **Apple:** It is the delicious fruit helps in the treatment of diabetes because of its rich pectin content. An apple a day keeps the doctors away.
- **Bengal Gram:** It is an important Indian diet; it helps in lowering the fasting blood sugar.
- **Onion:** Onion extract is used in interavenous glucose tolerance.
- **Oats:** Oats help stabilize blood sugar, have estrogenic and antioxidant activity.
- **Garlic:** Garlic has significant blood sugar lowering action. These ingredients lower completing with insulin for insulin-inactivating sites in the liver.
- **Soybeans:** It is a form like whole beans or sprouts. It is used in reducing blood sugar level in diabetic. It is helpful in urinary excretion in diabetic mothers.
- **Groundnut:** It is great influence in controlling the blood sugar level in diabetic.
- **Grapefruit:** It contain high source of minerals and it helps in refresh to the diabetic mothers.

Exercise

- Mild exercise is recommended for the mother because exercise causes a redistribution of blood flow and increase the ischemic injury to the placenta
- 15 – 30 minutes of walking 4 – 6 times a week
- Other Exercise include Non weight bearing activities e.g. arm ergometry, recumbent bicycle, swimming.
- The best time for exercise is after meals, when the blood sugar is rising.

Antenatal Exercises

- **Walking:** Take a brisk walk of ½ - 1 hour daily. Try to increase the distance every day.
- **Abdominal Tightening / Transverse Exercises:** Sit comfortably or kneel on all four with a level spine. Breathe in and out and then gently pull in the lower part of the abdomen below the umbilicus keeping the spine still and breathing normally. Hold for up to 10 seconds then relax gently. Repeat up to 10 times.

- **Pelvic Tilting or Rocking Exercises:** Do this in a half-lying position well supported with pillows, knees bent and feet flat. Place one hand under the small of the back and the other on the top of the abdomen. Tighten the abdominals and buttocks and press the small of the back down on to the underneath hand. Breathe normally, hold for up to 10 seconds then relax. Repeat up to 10 times.
- **Pelvic Floor Exercises (Kegel Exercises):** Sit, stand or half-lie with legs slightly apart. Close and draw up around the anal passage as though preventing a bowel action, then repeat front passage (vagina and urethra) as if to stop the flow of urine in midstream. Hold for as long as possible up to 10 seconds, breathing normally, then relax. Repeat up to 10 times.
- **Foot and Leg Exercises:** Sit of half-lying with legs supported. Bend and stretch the ankles at least 12 times circle both feet at the ankle, at least 20 times in each direction. Brace both knees, hold for a count of four, and then relax. Repeat 12 times.
- **Breathing Exercises:** Sit comfortable with eyes closed. 'Listen in' to your breathing concentrating especially on the outward breath, recognizing the short pause before the inward breath naturally follows. Keeps the movement fairly low down in the chest and be aware of your own breathing rate whilst resting.

General Care

- Eye care, foot care, general skin cares are very important.
- A daily bath with good perineal care is important.
- For dry skin lotions, creams, oils can apply.
- Tight clothing should be avoided.
- Feet should be inspected regularly, toe nails should be cut to prevent foot problem.
- Extreme of temperature should be avoided
- Should wear an identification bracelet at all times.
- Alternative primary treatment for GDM is hypocaloric diet/ exercise / insulin.
- Blood glucose level should be monitored carefully.
- Insulin administration by continuous infusion / intermittent subcutaneous injection.
- Foetal heart monitoring
- Maintain side lying position to prevent supine hypotension.

Conclusion

Small things can make a big difference. The hospitalization costs for the complications of diabetes are particularly heavy. This underscores the need to reduce complications and also their economic burden so regular follow of mild exercise along with dietary plan helps to reduce Gestational Diabetes during pregnancy.

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