Review Article

Indian Journal of Maternal-Fetal and Neonatal Medicine
Volume 2 Number 2, July - December 2015
DOI: https://dx.doi.org/10.21088/ijmfnm.2347.999X.2215.4

Gestational Diabetes Mellitus

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Abstract

Gestational Diabetes Mellitus is to be studied thoroughly as there is increasing trend of it due to increasing maternal age and obesity and we as obstetricians are afforded the rare opportunity to alter the natural course of the disease and change the future health of women and her newborn. We must all have a vision towards Gestational Diabetes Mellitus and a mission not to miss it in any patient and as Obstetricians we should be able to do multi-tasking so as to reduce the constraints of human resources like dietician, dialectologists and physician in our clinical setting. 75 g Glucose Challenge test (DIPSI) is promising, single step, cost effective one to diagnose Gestational Diabetes Mellitus. Lifestyle Modification with multiple treatment modalities including Oral Hypoglycemics, Insulin can make the diabetic pregnancy comparable to non-diabetic in its maternal and perinatal outcome.

Kewywords: Gestational Diabetes Mellitus; 75 g Glucose test; Glucose Intolerance; Insulin; Oral Hypoglycemic; Medical Nutrition Therapy.

Introduction

We must all have a vision towards Gestational Diabetes Mellitus and a mission not to miss it in any patient. Every one of us should be an expert in the diagnosis and management of Gestational Diabetes Mellitus. We as Obstetricians should be able to do multitasking so as to reduce the constraints of human resources like dietician, diabetologists and physician in our clinical settings. We as obstetricians have a multifocal role in primary prevention (obesity, PCOS), secondary prevention (Gestational Diabetes Mellitus) and tertiary prevention of diabetes like avoiding complications and reducing the obesity [1]. The only thing is we need a vision before and beyond pregnancy so that we can offer better care of Gestational Diabetes Mellitus.

Diabetes and Pregnancy

Pregnancy itself is a glycogenic state. Therefore pregnancy offers a window to recognize the future diabetic patients, thus contributing on primary prevention of diabetes in future life [2].

Gestational Diabetes Mellitus itself causes increase in maternal morbidity and fetal morbidity and mortality. Hence it is included in high risk condition. Maternal hyperglycemia in pregnancy is associated with development of metabolic syndrome (Syndrome X including Type II diabetes) in the future; thus setting a stage of further development of all non-communicable diseases.

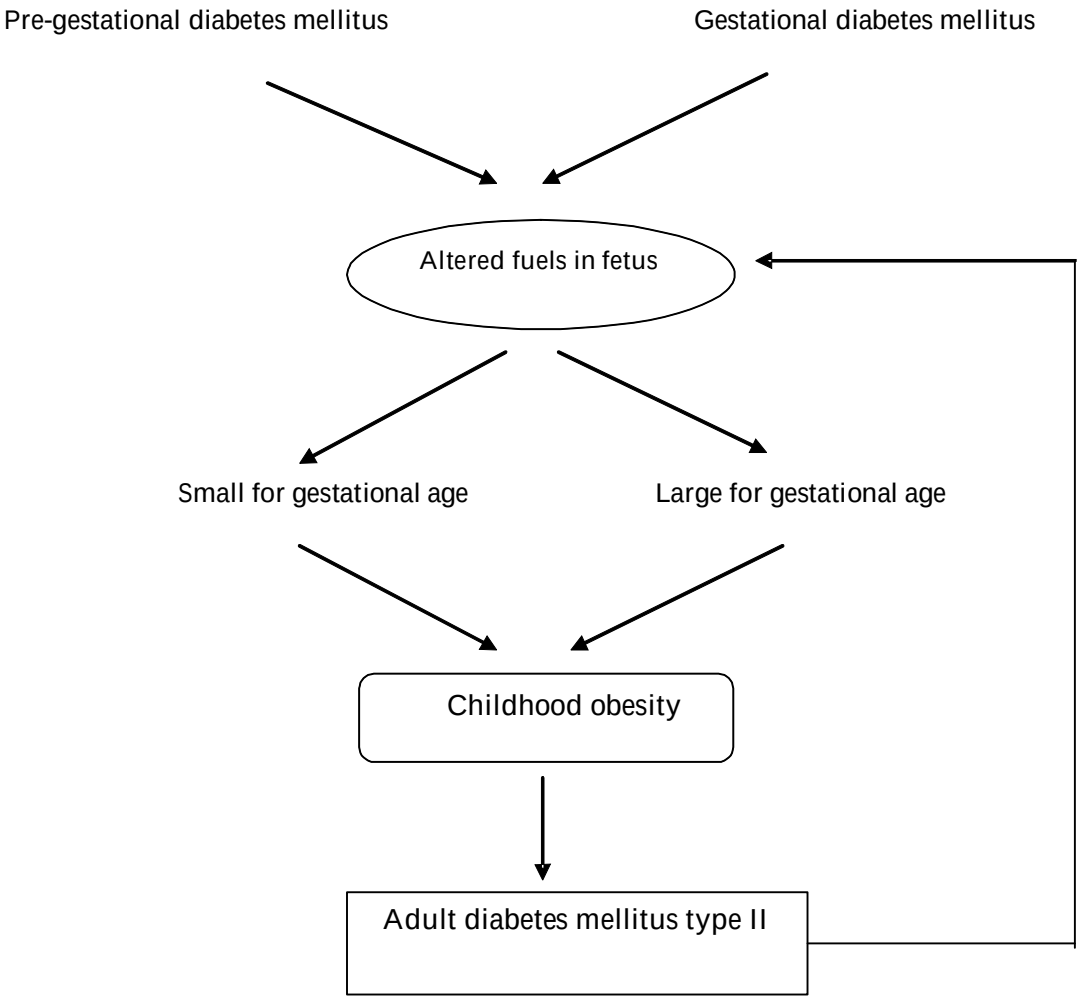
The future is that the women who exhibit glucose intolerance during pregnancy are more prone for development of type II diabetes in the next 15 years of life and their offspring has a very high chance of childhood obesity and adult onset diabetes [3].

We as obstetricians are afforded the rare opportunity to alter the natural course of the disease and change the future health of women today.

Fetal Prognosis

If the mother is malnourished the small for gestational age and baby is born with Insulin resistance, thus setting a stage for adult onset diabetes in the offspring.

If the mother is over nourished, the large for gestational age and macrosomic baby born results in



fetal adiposity and itself islet dysfunction which is an essential element in the setting of adult onset diabetes in offspring [4].

Thus small for gestational and large for gestational age baby born to any mother is prone to develop adult onset diabetes in future life. These can again pass to intergenerational transfer of risk. *Thus a vicious cycle continues which need intervention.*

We as obstetricians have a huge role to play to prevent LGA / SGA baby to prevent diabetes in next generations.

Epidemiology: Scale of the Problem

Diabetes atlas IDF 2011 shows that 8.3% of the population is diabetic whereas another 6.4% population has impaired glucose tolerance. It is estimated that in 2030, the diabetic population will be 9.9% and with impaired glucose tolerance will be 6.7% [5].

Around 79% of this population lives in middle and low income group. This is said to be due to rapid economic urbanization and over-nutrition.

India and China lead the list of top ten countries leading in diabetic population.

The South Asia region has a crude prevalence of Gestational diabetes mellitus as 10.5% which is very high [6].

Gestational diabetes mellitus prevalence is linked to background impaired glucose tolerance rates. As the age of childbearing is increasing in females the age of adult onset diabetes and impaired glucose tolerance is steadily decreasing leading to more and more women of reproductive age group with impaired glucose tolerance and type II diabetes. Indian women are 11 fold more prone for developing glucose intolerance during pregnancy due to genetic predisposition [7].

A number of authors have reported a high prevalence of Gestational diabetes in India Dr. V. Sheshiah (16.2%), Dr. Anjlakshi (15%), Dr. Mary John (17.5%), Dr. Paulose (15%).

If we consider 27 million deliveries per year in India

we have to tap 3 million Gestational diabetes mellitus cases per year.

For this standardization for diagnosis of Gestational diabetes mellitus and its care is very important for it will make things easier.

Hence FOGSI, DIPSI, and World Diabetic Foundation (WTF) came together and formed standard guidelines for diagnosis and care of Gestational diabetes mellitus in 2011.

Pathophysiology of Gestational Diabetes Mellitus

Why pregnancy is a glucogenic condition? This is because of the de novo structure arising due to pregnancy in the body (fetoplacental unit). This structure expands, matures till the end of pregnancy and finally expelled out of the body. The hormonal-metabolic adaptation for this structure leads to the facilitated Insulin action in first half of pregnancy and a diabetogenic stress in second half of pregnancy [8].

Insulin is an anabolic hormone. Glucagon is a catabolic hormone. The coordinated action of these two hormones maintains the normal plasma glucose level in the mother.

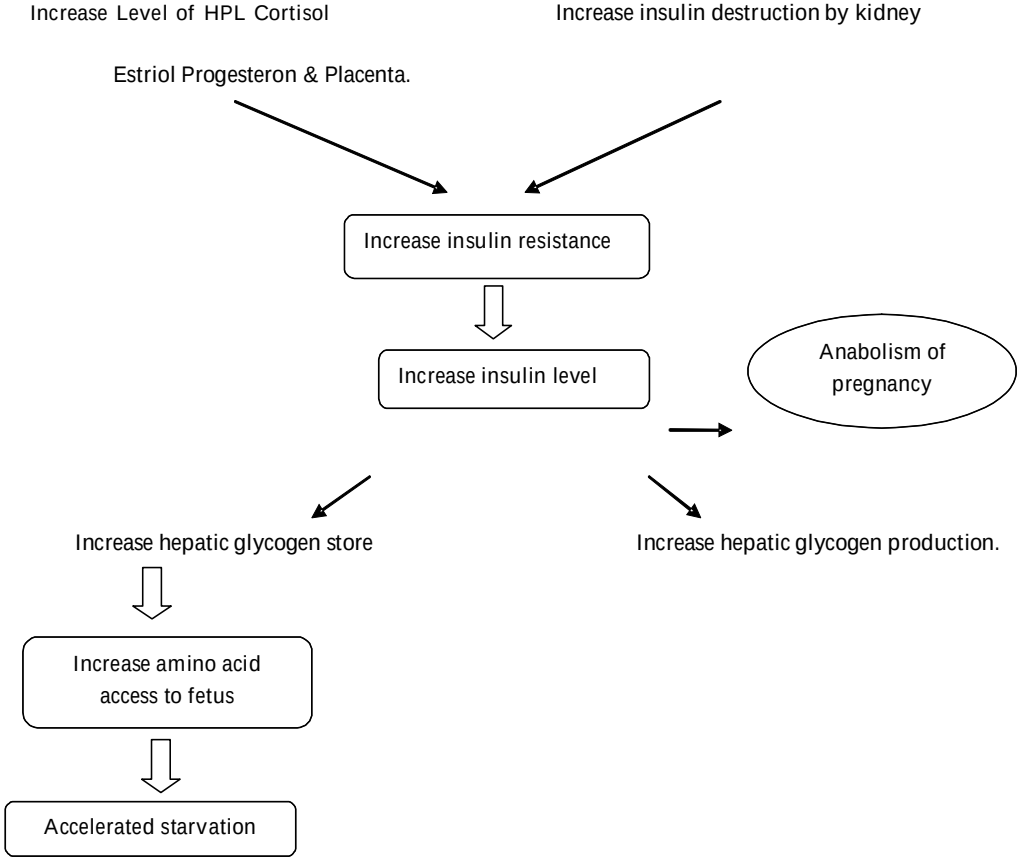
The first half of Pregnancy

Blood Sugar	Non-pregnant	Pregnant
Fasting	80-90 mg / dL	71±8 mg/dL
1hour postprandial	100-120mg/dL	109±13mg/Dl
2hours postprandial	110mg/dL	99±10mg/Dl
Mean(24 hours)	100mg/dL	88±10 mg /Dl

The estrogen and progesterone secreted by the placenta and the body in early pregnancy lead to Beta cell hyperplasia and thus hyperinsulinemia, therefore this leads to increased peripheral glucose utilization and hence decreased fasting plasma glucose levels. Hyperinsulinemia itself is an anabolic action for the body and hence is beneficial in pregnancy. This leads to a typical pattern of euglycemia in normal pregnancy [9].

Hormonal Changes in Pregnancy

As the placenta goes on increasing in volume and efficiency from 8 weeks onwards the levels of estrogen, progesterone, human placental lactogen and insulin



go on increasing steadily till 40 weeks of pregnancy. Once the delivery occurs, the levels of this hormones fall abruptly.

All these hormones have insulin resistance property; hence as pregnancy advances, the action of insulin are blunted therefore level of insulin goes on increasing in body leading to anabolisation. The action of Insulin and Glucagon is contrary to each other therefore the neoglucogenic potential of glucagon is blunted in the immediate postprandial period. The "spare" ingested amino acids are thus accessible to the fetus.

The metabolic changes which occur 72 hours of starvation in non-pregnant state are seen in 16 hours during pregnancy due to accelerated starvation. Hence pregnant women are advised not to be fasting too long.

There is increase lipolysis in pregnancy because; mother utilizes fat for her caloric needs and save glucose for fetal needs. Also there is change in gluconeogenesis pattern because the fetus preferentially utilizes alanine and other amino acids depriving the mother, a major neo-glucogenic resource. This all metabolic changes of normal pregnancy along with increase insulin resistance cause pregnancy as a dibetogenic condition.

In non-pregnant state insulin levels are normal without insulin resistance, hence blood sugar remains normal. In pregnancy as there is an increase insulin resistance causes increase in insulin levels which counteracts each other and blood sugar remains normal. But in case of gestational diabetes mellitus this imbalance is there because of high insulin resistance causes increase in blood sugar level.

The high resistance in the case of gestational diabetes mellitus may be due to genetic factors, obesity and increasing maternal age [10].

This results in high glucose levels in the mother, the higher the inability to secrete adequate insulin in insulin resistant cases the higher are the blood sugars, more are the chances of gestational diabetes mellitus.

Pathophysiology of Gestational Diabetes Mellitus

As pregnancy advances insulin resistance increases. This creates a diabetogenic stress in maternal body. In response to this insulin resistance, body secretes progressively and proportionately increased insulin. This 'extra' insulin if adequate will enable to maintain blood sugar levels. If this compensation is inadequate, will result in Gestational diabetes mellitus.

Hence, Gestational diabetes mellitus represents chronic β cell dysfunction. This is stage in the evolution of Type II Diabetes mellitus [12].

This should be the main concern of today's obstetricians to diagnose Gestational diabetes mellitus as to predict future Type II DM.

Complications of Diabetes in Pregnancy

Complications at all stages of pregnancy are known in this disease.

Fetal

Spontaneous abortions, congenital malformations, unexplained still births, Macrosomia

Maternal

Antepartum

a. Medical problem: Hypoglycemia, Infection, Starvation ketosis, Diabetic ketoacidosis, Retinopathy, Nephropathy, Cardiopathy, Neuropathy, Electrolyte imbalance
b. Obstetrics: Pre-eclamsia, Pretemlabor, PROM, Polyhydrominos

Intrapartum

Prolonged labor, CPD, Postpartum hemorrhage, operative deliveries, increase incidence of caesarean section.

Postpartum

Puerperial sepsis, wound infection, uterine sub-involution, secondary PPH.

Neonetal

Short-term-hypoglycemia, hyperbilirubinemia, hypocalcemia, hypothermia, polycythemia, neonatal jaundice, respiratory distress syndrome, renal vein thrombosis.

Long-term-obesity, type II diabetes, cardiovascular disease, impaire cognitive development, impaired motor functions.

How to Diagnose Gestational Diabetes Mellitus?

A single test, universally acceptable, with a good positive predictive value, cost effective and easy to perform has been advised by DIPSI (Diabetes in pregnancy society of India).

This includes taking 75 gm glucose in a glass of

water by the pregnant lady irrespective of the last meal taken. After 2 hours blood sugar levels are done. If blood glucose > 140 mg / dL, she is diagnosed as a case of Gestational diabetes mellitus [13].

DIPSI test is single step cost effective, reliable, and easy to perform. As there is fasting stat is not required and for diagnosis single diagnostic value is taken into consideration, so there is no confusion regarding to multiple values as in other test i.e., OGTT, WHO, IADPSG & ADA. There is no need of sophisticated laboratory, technicians, and stable electric supply required.

Interpretation of Test

Blood sugar levels	Diagnosis
>140 mg %	Gestational diabetes mellitus
120 - 140mg%	Glucose intolerance (IGT)
<120 mg %	Normal

When to do the Test [14]?

The test should be done once in every trimester i.e., First visit (12-16 weeks), 24-28 weeks, and then at 32-34 weeks.

In whom to do?

All pregnant ladies of Asian origin (South Asian ladies have an 11 fold increased chance of Gestational diabetes mellitus) .

Other Diagnostic Tests

Criteria for Positive 75g OGTT in Pregnancy

	Fasting plasma glucose	1-hr plasma glucose	2-hr plasma glucose
WHO	≥ 126 mg/dl		≥ 140 mg/dl
IDAPSG & American dibetes association	≥ 92 mg / dl	≥ 180 mg/dl	≥ 153 mg / dl

Rationale of the Test

After any glucose challenge, any patient will have a brisk and immediate insulin response which is adequate to maintain blood sugar levels (<120 mg %).

Whereas a woman with Gestational diabetes mellitus (chronic β cell dysfunction) the insulin response is grossly inadequate. Hence after 2 hours the blood glucose is above normal (>140 mg %).

A woman with somewhat inadequate response of insulin secretion in response to glucose load, will have deranged blood sugar levels (120-140 mg%).

Management Principles of Gestational Diabetes Mellitus

Gestational diabetes mellitus is the most common medical disease in pregnancy, which is the cause of increased maternal and perinatal morbidity and mortality. The best part of this disease is the morbidity and other complications can be minimized if target blood sugar levels are maintained.

Target Levels

The current therapeutic targets recommended by the ADA are:

- Fasting blood glucose level d" 95 mg / dl
- 1 hr post prandial glucose level d" 140 mg / dl
- 2 hrs post prandial glucose level d" 120 mg / dl
- Mean blood sugar levels 110 ±10 mg%

How Can This Goal be Achieved [15]?

(a) Diet

(b) Exercise

(c) Medicines Insulin and oral hypoglycemic agents

(d) Psychological support

(e) Explain and educate

Monitoring of Blood Sugar Levels

Once targeted sugar levels are achieved Self Monitoring of Blood Glucose (SMBG) is recommended. Ideally it should be done daily on the regular basis or at least once in a week. If SMBG is not possible then laboratory venous level should be done within 15 days.

Principles of Management [16]

- Diet
- Exercise
- Achieving glycemic control (SMBG)

- Management of hypoglycemia
- Oral hypoglycemic
- Insulin
- Timely delivery
- Postpartum follow up
- Contraception
- Care of new born.

Diet

Eat Healthy

Dietary education can have many benefits for women with gestational diabetes, including improved glycemic control, appropriate weight gain and permanent improvement in the life style. Minimum of 175 gm of carbohydrate per day, with total carbohydrate intake <45% of total energy. Consistency in carbohydrate intake at meals and snakes from day to day. Consumption of low glycemic food with lots of fruits and vegetables i.e., complex carbohydrates more fibrous diet, healthy whole grains are advised, limit caffeine, fast foods.

Content of a Diet must Constitute:

- Carbohydrates- 50-55 %
- Proteins – 25 -30 %
- Fats – 15 – 20 %

Normal weight gain in pregnancy is 10-12 kg. Those having BMI> 30 are recommended 5-9 kg weight gain. Normal caloric requirements [18]:

- Normal BMI – 30 Kcal / kg
- Overweight -25 Kcal / Kg
- Obese – 15 -20 Kcal / Kg
- Underweight -35 Kcal / Kg

Foods which have low glycemic index are Legumes, Lentils, Peas, Bengal grams. These must be include in daily diet. Food which have high glycemic index are Rice, Bread, Potato. Candy bars should be avoided as far as possible.

Fats

Amount of fat in diet matters: Fat content should be low nearly 15-20% of total caloric intake and consumption of unsaturated fatty acids must be increased.

Proteins

Proteins are converted to sugar more slowly than carbohydrates in the process of gluconeogenesis.

The individual portion size of carbohydrates, proteins, fibre, fat and glycemic index food should be adjusted for each person according to his requirements and preference.

Supplements

Folic acid, Calcium, Iron as per recommended standard dose supplementation of B-complexes should be more in order to prevent neurological damage because of diabetes.

Exercise

Exercise plays a very important role in patient prone for Gestational Diabetes Mellitus. It is unlikely to develop Gestational Diabetes Mellitus in women who exercise regularly before 20 weeks of gestation. Women who exercise regularly should continue to do exercise during pregnancy also. Strenuous and weight lifting exercises are not recommended during pregnancy. However walking, swimming and Yogasanas are recommended in pregnancy. Women who were not exercising regularly can also start exercise during pregnancy like walking for 15-20 minutes daily. Gradually it can be increased till 30-40 minutes for all days of a week. Participation in any kind of exercise during pregnancy is likely to reduce the likelihood of Gestational Diabetes Mellitus by 50% [21]. Upper body exercises are preferred during pregnancy. Avoidance of fall and maintenance of balance of body during pregnancy is important. Benefits of exercise during pregnancy include increased insulin sensitivity, decreased reductive stress and fat mass of the body. Exercise should only be done if there are no contraindications during pregnancy.

Oral Hypoglycemic Agents [22]

Oral hypoglycemic agents available are Sulphonylureas – Glebenclamide, Glyburide- stimulates insulin release from β cells. Bigunides- Metformin – improves insulin resistance and α glucosidase inhibitor - Acarbose – reduces glucose absorption.

These agents are required to achieveand maintain euglycemia., Not be harmful to mother and fetus., Not be teratogenic. These should be approved in pregnancy usage.

Mechanism

As hyperglycemia in pregnancy is secondary to

insulin resistance; anything which decreases insulin resistance or increases insulin secretion should be effective in treatment of Gestational Diabetes Mellitus.

When to use Oral Hypoglycemic Agents [24]?

If blood sugar levels are > 140 mg/dl use of metformin or glebenclamide is recommended.

Glibenclamide [24]

It does not cross placenta. No fetal harm and very effective in control of blood sugar. It is a very promising drug. It is as effective as insulin in pregnancy as regards to mean birth weight, cord insulin levels, gestational age at birthand perinatal outcome.

Metformin [24]

The metformin in gestational diabetes (MiG) trial conclude that metformin, either alone or in combination with insulin, is safe and effective as a treatment for gestational diabetes, with benefits including patient acceptability and reduced weight gain. It is Able to maintain euglycemia efficiently. Mothers prefer it to insulin. It is associated with lower weight gain in pregnancy which proves to be beneficial in Gestational Diabetes Mellitus. But is able to cross human placenta, hence proper counseling, documentation and risk of fetal exposure is warranted. NICE, Australian Diabetes Pregnancy Society, WHO, IDF accordingly recommend the use of Metformin and glibenclamide in pregnancy, but it has to be considered on individual basis.

Insulin

Insulin have been a standard treatment for many years for gestational diabetes. However, recent research has focused on the safety of newer insulin analogue in pregnancy. These are attractive options due to convenient timing of administration and lower risk of hypoglycemia. Insulin is the drug of choice if **b**lood sugar levels are Fasting - > 120 mg% and Postmeal > 200 mg %, patient is put on MNT (modified nutritional therapy) for 15 days and if fasting blood sugar levels are > 90 mg% and postmeal > 120 mg %; insulin is started. Insulin maintains euglycemia in mother as in a nondiabetic patient so that both mother and baby are safe.

Target Blood Sugar Levels [26] **a**chieved are fasting – 80-90 mg%, postmeal-- 110-120 mg% mean blood sugar level – 95-105 mg %. The target weight attained is mean birth weight – 2.5 -3.5 kg

Available Insulin

Type of Insulin	Onset	Peak	Lasts for
Rapid acting (Human insulin R , Lispro ,Aspart)	½ hour	2 hours	8 hours
Intermediate acting (Human lente, Human NPH)	4 hour	8 hours	14 hours
Long acting (Altra-lente, Glargeine, Detemir)	4 hour	6-8 hours	20 hours
Short acting (Human insulin R)	½ hour	3-4 hours	10 hours
Combined (Mixtard 30% S+70% Isophane)	½ hour	2 hours	18-20 hours

Insulin Regimens

Conventional

- Initial dose of Intermediate acting 4 IU given before breakfast.
- If sugar level is elevated pre-lunch then use regular insulin.
- The already given intermediate Insulin will take care of post-breakfast and post-lunch sugars.
- The above regimen controls in most of the cases.
- If post-dinner sugar increased then give regular insulin before dinner.
- If fasting increased then give regular + intermediate insulin before dinner.
- Intermediate + regular for morning (2/3rd) Intermediate + regular for evening (1/3rd) = mixed or split dose of Insulin.
- Intermediate (2/3rd) + short acting (1/3rd)
- If still fasting hyperglycemia, evening dose of regular + intermediate insulin given at bed time.
- Prefilled syringes with intermediate (2/3rd) + regular (1/3rd) are available now and can be used.

Simplified

- Morning – start 30/70 premix 4 IU before breakfast, go on increasing inj. insulin every 4th day 2 U till

10 U.

- If fasting blood sugar > 90 mg % and post-meal > 120 mg %, give 6 U premix before breakfast and 6U premix before dinner.
- Review blood sugar and adjust the dose.
- If post breakfast blood sugar increases, start with premix 50/50.

Post Prandial Control [27]

It is very important as many studies have stated that postprandial blood sugars are more predictive of neonatal outcome than fasting blood sugars. Insulin dose is always must be individualized adjusted on follow up, less in Gestational Diabetes Mellitus than in type I and type II diabetes. Gestational Diabetes Mellitus requires rarely more than 20 U.

If insulin requirements fall it indicates fetal jeopardy, IUFD and a bad perinatal outcome

Monitoring of Blood Glucose Levels [28]

Ideal method of monitoring blood glucose is SMBG. The Postprandial 2 hour blood sugar monitoring gives excellent results in Gestational Diabetes mellitus. But every day SMBG is difficult. So weekly monitoring on fixed day recommended. If SMBG is not possible laboratory evaluation is mandatory when patient is on Insulin therapy.

Insulin in labour [29]

The usual NPH is taken the night before and no insulin in morning is given. Blood sugars are done. Ideally blood sugars should be 80-100 mg %. Use of glucometers during labour is recommended.

In active labour the same regimen is to be followed

Blood sugars	Insulin / IV fluids
60-90mg%	5% DNS -100ml / hour
90-120mg%	NS – 100 ml / hour
120-140 mg %	NS – 100ml / hour + 4 U Regular insulin
140-180 mg %	NS – 100 ml / hour + 6 U Regular Insulin
>180 mg %	NS -100 ml / hour + 8 U Regular Insulin

Blood sugars should be done every hourly in labour room. Strict NST monitoring is required [30].

Post-delivery

Once the placenta is out, the insulin requirement falls abruptly. It may not be required in Gestational Diabetes Mellitus in post partum period.

Lactation

Insulin is safe (if required) in lactation period.

Maternal and Featal Surveillance Ingestational

Diabetes Mellitus

As blood sugar level rises, both mother and fetus are at increased risk of morbidity. Hence antepartum surveillance and proper treatment will ensure maternal and fetal complications to a minimum. Surveillance also ensures the obstetricians and avoid preterm interventions [31].The objectives of the surveillance is achieving a target blood glucose level, (Fasting - < 90mg% Post prandial 1 hour -< 140 mg% 2 hour - < 120mg%), monitoring mother and fetus.

Role of USG in diabetic pregnancy is to establishs accurate dates., rules out Anomalies, monitors growth, antenatal testing. For fetal wellbeing, helps to decide appropriate timing of delivery and helps in Detection of macrosomia i.e., birth weight > 90th percentile or abdominal girth > 75th percentile.

Doppler in Gestational Diabetes Mellitus

Doppler has its own importance in the management of diabetic pregnancy. If Uterine notch is seen at 24 weeks of pregnancy it is predictive of PIH The Umbilical artery and MCA Doppleris useful for diagnosis of IUGR.

Monitoring Fetal Growth

USG acts as a guiding light in high risk pregnancies for detection of IUGR or macrosomia. The Fetal abdominal circumference is done in 2nd trimester and every 2-4 weeks, thereafter to monitor fetal growth. SMBG is very important factor along with fetal growth monitoring.

Antepartum Testing

Frequency of SMBG depends on severity of maternal hyperglycemia. Fetal movement monitoring is done by all mothers in last 8-10 weeks. NST is done after 32 weeks. BPP and Doppler may be considered

if fetal growth is excessive or less.

In Labour [12]

Gestational Diabetes Mellitus Patient:

- Admission CTG
- Partogram
- Blood sugars every 2 hours
- Target -100mg% (80 -120 mg%)
- Continue fetal monitoring

Insulin dependent Gestational Diabetes Mellitus

- Admission CTG
- Partogram
- Blood sugars every 2 hours
- Target -100mg% (80 -120 mg%)
- Continue fetal monitoring
- Plus DO serum electrolytes + IV fluids according to blood sugar levels.
- 80-140mg% à25 U plain Insulin in 500 ml 5% Dextrose or 100ml / hour DNS.

Induction of Labour

Before induction of labor the usual evening NPH Insulin is given the night before. And no Insulin is given the next morning. Induction is done. Thereafter **b**lood sugars are done every 2 hours. They should be in the range of 80-100 mg%. When active labor begins, same dose of Insulin is needed through the labour. Insulin requirements fall precipitously after the delivery of the placenta. Dose of insulin is adjusted in the postpartum period as per the blood glucose levels. These patients have more risk of PPH due to macrosomia, and polyhydramnios.

Planning for Elective LSCS for gestational Diabetes Mellitus on Insulin includes the following orders. Keep NBM, Omit morning dose of Insulin, Do Fasting blood sugar levels and serum electrolytes, Dose of Inj. Insulin depends upon blood sugar levels Do Post operative blood sugar levels every 2 hours for first 12 hours and every 4 hours till patient starts orally.

Postpartum Surveillance

The woman is counseled regarding **d**iet, exercise and Contraception. GCT is done 48 hours postpartum and 6 weeks postpartum. If GCT is significant after 48 hours she is diagnosed as having overt diabetes. If GCT is significant after 6-8weeks she is diagnosed as type II DM. After 1 year glucose metabolism is assessed in the patient. Thereafter regularly glucose metabolism is assessed annually.

Preconception Counseling [32]

The woman should plan the pregnancy. Her HbA1C should be < 6 gm %. She should start folic acid if she is on oral anti-diabetic drugs they are discontinued and insulin started titration of the dose done as per need. Nutrition and weight gain counseling given. Patient is asked to avoid hypoglycemia and ketoacidosis. She is trained for SMBG. She is explained that any reduction of HbA1C < 6 gm% will decrease the risk of congenital malformation and monitoring by SMBG gives best results.

Breastfeeding

Women should take a snack / meal before breastfeeding. This helps in reduction of weight, contraception, and less chances of future metabolic syndrome. Exclusive breastfeeding is useful.

Contraception

Offering contraception is of prime importance in this case of GDM. These are the following choices. Barrier methods are best because they protect from STDs, have no effect on glucose metabolism, no systemic side effect but needs strong motivation and careful instructions as failure rates are high. IUCDs are effective, reversible with no risk of PID, no metabolic disturbances, excellent pregnancy protection with low Failure rates (<1%). Harmonalpills. The COCS are acceptable with risk. Progesteron only pills are effective but will give rise to weight gain so can have a deleterious effect on metabolism. Injectables / implant there is no data available as very few studies are published. However contraception practices should be individualized as per the patient's needs.

Beyond the Postpartum [33]

If glucose challenge test with 75 g glucose is positive after 3 months postpartum; the women is more prone to have type II DM and metabolic syndromes X in future life. Hence considering counseling, weight reduction, exercise, modified nutrition therapy, and yearly assessment of glycemic status is important. The Risk factors in postpartum are age > 35 years, family history of DM and Obesity (BMI>30). These women should be meticulous.

Conclusion

The importance of gestational diabetes in obstetrics practice is evolved rapidly with the global increase in maternal obesity and age at delivery. New diagnostic criteria have been developed to align the diagnosis of gestational diabetes with adverse pregnancy outcome, in particular those associated with excess fetal size and adiposity.

Whilst universal accept Gestational Diabetes Mellitus is a major cause of maternal and fetal morbidity with the advent of new drugs, availability of ample blood and emergence of active management of labour with safe protocols, the maternal and neonatal mortality rates are slowly decreasing.

But new entities of maternal and fetal morbidity like Gestational Diabetes mellitus are emerging -BMI due to the sedentary life styles and faulty diet habits.

The young generation is more prone for diabetes.

The insulin resistance in pregnancy serves as a catalyst for the development of Gestational Diabetes Mellitus.

The importance of new diagnostic strategies has yet to be achieved; widespread recognition of the value of uniform approach to diagnosis and classification of hypeglycemia in pregnancy is evolving.

New frontiers in treatment include potential role of oral hypoglycemic agent and the use of customized glycemic treatment targets adjusted according to assessment of fetal growth.

Evidence in the area of potential fetal surveillance, timing and mode of delivery remains sparse, with clinical decisions based more on local preferences and protocols that on high level evidence.

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