Diabetes MELLitus (DM)

Classification during pregnancy:

Type 1 DM :-

Formerly known as juvenile-onset or insulin-Dependent DM
, absolute insulin Deficiency - Pancreatic B-cell Destruction
Can begin any age more <30 years but in 5-10% >30 year

Type 2 DM (NIDDM):-

Formerly known as adult onset or NIDDM.
Paipheral resistance to insulin and unable to compensate
For the resistant by increasing insulin Production.

Gestational DM:-

Similar to Type 2 DM Carbohydrate intolerance First
occurs during pregnancy or First detected during pregnancy
It's either due peripheal insulin resistance or
insulin Deficiency.

4-5 % of Pregnancies are complicated by D.M.
90% ⟶ Cause is GDM
Incidence of GDM is increasing 3.3% Canda,
5% USA , 14% South Africa.
. Before introduction of insulin D.M can Lead to
increased PN mortality and morbidity.
. GDM:-
increased insulin Resistance in 2nd Trimester due
~~also~~ to placental Lactogen, Prolactin, Cortisol, estrogen
And progesterone. Also increased insulin
Clearance.

Diabetic Screening in Non Pregnant Patient:-

	Normal Fasting	2h. after 75g glucose
CHO intolerant	110-125	140-190
D.M	≥ 126	≥ 200

Symptoms of D.M: polydipsia, polyphagia,
Polyuria, wt-loss. Recurrent Vulval boils, blurred vision

Gestational D.M Risk group:

Obse, H/o GD.M, Family IH D.M, >25y
Previous Macrosomic baby, PCO, Twin pregnancy.
Racial (Asian, Hispanic, AFrican-Caribbean)

I) UK: (Nice)

Whom: Selective if +ve Risk Factors without regard to age. 10% Missed.

How: At 24-28 weeks 2 hour 75 gm OGTT
Screening & diagnostic. Fasting 7. 2h 7.8.
one reading required >abnormal

IF H/o GD.M:
Screening 16-18 weeks if Normal Repeat 28 weeks

II) ACOG:

2 step approach.
Universal, more Practical. Sensitive. No screening if <25y IF NO Risk Factor

- **1st Step:**
  50 gm oral glucose challenge
  ↓
  Chek serum glucose at 1 Hour (No Fasting required)
  ≥ 130 mg/dl 7.2 → Discover 90% of G.D.M
  ↓
  Do
  3hour. GTT glucose Tolerance Test. or 75 gm.
  if abnormal fasting or any Two abnormal →
  Diagnostic D.M.
  . follow-up GTT can be done 32-34W (To identify Late onset D.M)

USA

	ADA 75 gm	ADA (American Diabetes association) 100 gm	
F	5.3	5.3	95
1	10	10	180
2	8.6	8.6	155
3	—	7.8	140

Pre-pregnancy Counselling :. For Type 1 & 2

1. High dose Folic acid 5mg (400ug) upto 12/52.
2. Evaluate renal function (24H urine collection For Protein + Creatinine Clearance)
3. Full history and Examination.
4. Opthamology referral.
5. Echo (>30y, smoker, hypotensive)
6. Cardiologist referral if suspected cardiac illness.
7. Monitor Medications : ACE I (Cause oligohyd. Renal fake. Skull dif dg,
8. Aspirin if Risk of Preeclampsia.
9. HbA1c < 6.1 if Decreased Less Congenital anomalies (HbA1c in preg not sensitive)
   HbA1c ≥ 9.5% carries >20% Fetal maj or anomalies. (advice women HbA1c >10% To Avoid Pregnancy)
10. Stop OHA and start insulin if required (apart from Metformin)
- FBS is Low in pregnancy due increased Renal Clearance, ↑ non diabetic ↑ insulin To 5% To overcome The Resistant.
- Type 1 D.M ↑ Insulin Requirment 3 Times the normal dose.
- Pt at risk of:
- Hypoglycemia < 3.9
  Common 45% of DM1
  Vomiting in Early pregnancy.
  nausea, headach, Tremer, blurred or double vision. weakness, hunger, confusion, Paraesthesia, Stupor.
  Rx: give glucose tablet or 4 ounces of juice.
  ↓ 20 Min chek Blood sugar.
  Reapt feeding until RBS > 7 mmol/dl
  if cant take orally
  10% Dextrose amp. IV push Then.
  5% Dextrose ... glucagon injection.

× Rapid Progression of Microvascular and Atherosclerotic Disease (IHD, HF, cerebral ischaemia)
. Nephropathy : complicates 5-10% of D.M.
. Chronic hypertension
. Pre-eclampsia
. Preterm more in uncontrolled D.M.
. DKA:- Diabetic Ketoacidosis
Life Threatining . can occur at Lower blood glucose < 20G
Fetal mortality 10-30% . Maternal mortality is rare due to Proper Rx .
Causes:-
50% infection 20% Non compliance on Rx. 30% No cause .
Steroids + Tocolytics can precipitate DKA .
. ↑ blood sugar → glucosuria → Osmotic diuresis → Loss of Fluids, Na, K .
. Lipolysis , hepatic oxidation of Fatty acids → Ketones → Metabolic acidosis (↓ bicarbonate) → organ impairment
Cardiac Arrythmias
Ketones → placenta → Fetal distress.
Rx: . Fluids 1Lit N/s ≈ 1h. Then 1Lit /hr next 2-4 hours. change Then DsNS (RBS < 250)
. insulin infusing , K supplement, bicarbonate if PH < 7.1
× Risk of infection: UTI, wound, Candida due impaired neutrophil functi
Fetal complications:.
- M's Carriage ↑ Hb A1c due Congenital . A . For DM
- Congenital malformation.
30-50% of PN Mortality
hypoglycemia is principle Factor (hypoglycemia and hypokelonuria is suspected)
- 6-10% of Diabetic mother have Major Congenital . A
Cardiac (Transposition of Great vessels)
VSD . ASD . hypoplastic left ventricle

- CNS anomalies ↑ 10-fold
  NTD
- GIT malformations.
- Genitourinary Anomalies (polycystic kidneys)
- Sacral agenesis / Caudal regression.
  Rare 400 Times more Frequent in D.M.
- Macrosomia:
  Wt 4-4.5 90th percentile.
  25-42 of diabetics
  Shoulder dystocia ↑ 3-fold.
- IUGR
- IUFD 32-36w in uncontrolled D.M.

Complications of GDM:
Preterm Labor, ↑B.P, ↑ CIS Rate. ~~FCIs~~
Recurrent GDM, Type 2 D.M.
Macrosomia, Shoulder dystocia (Fracture + palsy)
neonatal hypoglycemia, ↑ bilirubin. (Late Obse, impair GTT. intellectual).
Cause of Macrosomia:
glucose it will pass to fetus by facilitated Diffusion → ↑ insulin Production by Fetus (act as growth F) → ↑ growth of cells.

Neonatal complications in infants of Diabetic Mother:-
- ↓Ca · ↓ Blood sugar · Neonatal Death.
- ↓Mg
- ~~33%~~ Polycythemia: ~~33%~~ HCT >65%
  chronic intrauterine hypoxia → increases Erythropoietin Production.
- hypobilirubinemia · neonatal jaundice : (Delay in Fetal Liver maturation in poor glycemic Control)
- RDS → ↑ Fetal hyperinsulinemia → Suppress production of surfactant
- Fetal Cardiac Septal hypertrophy and hypertrophic Cardiomyopathy.

Calculation and dose of initial insulin managment.

Don't more 60 U/day

0.7 U/kg (6-18 weeks)

0.8 U/kg (18-26)

0.9-1.1 (>26)

½ dose Am: — ⅔ NPH
\ ⅓ Novolog or Humalog.

½ Pm — ½ NPH
\ ½ Novolog

eg (60)

30 < 20 NPH / 10 N

30 < 15 / 15

if steroids used (↑insulin)

Antenatal follow-ups.

1. 1st Trimester < Control blood sugar / Retinal + Renal Checkups
2. 7-8w U/s For viability.
3. 16 weeks → Retinal Ex if abnormal 1st UTS, L
4. 20w U/s For heart and other structur
5. 28 U/s For Growth + A.F.
   Retinal Ex if normal in 1st T.
6. 32 U/s For Growth.
7. 36 U/s For growth.
   D/w Mode of Delivery. Timing
8. 38 I.O.L or C/s. if wt 7-4.5kg. Blood sugar 4-7 during Labor.

Delivery → ½ dose insulin.

Modify life style. Breast feeding, wt Reduction. Diet

GDM → Risk of D.M 20-50% with in 10y
GTT 6/52 post P.

Managment

- Multidisciplinary (Physican, Midwife. Obstr. nurse nutrition consultation)
- Referral ugently.
- Diet:
  - CHO 40% of Total calories.
  - Vegetables + Fruit of high Fibres
  - 1800 kcal/day → 2400 kcal/d.
- Exercises:
  - Walking - Yoga, Swimming. upper arm Ex } 30 min/day
- glucose monitoring "glucometer" at home and To be reviewed every 1-2 weeks.
  - Fasting, 1hr or 2h after each meal (4 Times)
  - Tauget:

UK Fasting 3.5 - 5.9.
1h.p.p <7.8.

ACOG. F → < 5.3
1h. < 7.2
2h < 6.7

Insulin:

① 4 injections. 3 Fast acting insulin before meals.
1 long acting at bed Time.

fast acting:

- Standard soluble insulin [Humulin S Eactrapid]
- OR Fasting acting insulin analogue [Novorapid, humalog) better

NPH is insulin of choice (intermediate acting) (onset 15 min, peak 2-4h) Less hypogly
is Neutral Protamin Hagedorn Peak 6h Last 12
humuli I.

② 2 injections [mixed long + Short) → ↑ Neonatal Complica