# Cardiac diseases with pregnancy

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#### Incidence of heart disease

- Average 4%-0.1 but varies from ,1%
- The commonest in developed countries are congenital, hypertensive and thyrotoxic heart diseases.
- ▶ In developing countries, rheumatic heart disease are the commonest.
- Now it is common to find pregnant women with surgically corrected hearts.

### Hemodynamic changes in normal pregnancy

- Blood volume increases by +50%
- Cardiac output increases by + .43%
- ▶ Heart rate increases by .17%
- Mean ABP increases+4%
- Stroke volume increases by+ .27%
- Systemic vascular resistance decrease by 21% -
- Pulmonary vascular resistance decreases by -34%



- These profound changes start as early as 6 weeks of gestation due to the effect of placental hormones.
- The increase in blood volume involves both plasma and cellular element, but plasma increase is greater ,so a state of hemodilution occur.
- Leucocytic count increases significantly
- Platelets also increase in number and activity.
- Fibrinogen level increases significantly together with most of the coagulation factors.

#### For these reasons

- Normal Hb concentration is set at 11 gm/dl for the first and third trimesters and 10.5 gm/do in the second trimester.
- Be cautious on interpreting laboratory values in a pregnant lady.
- > Even values for renal function tests are different from non pregnant.
- There is a transient fall of mean blood pressure especially during the second trimester., this may be misleading in hypertensive patients.

## Other physiologic changes during pregnancy

- The apex of the heart shifts up and laterally to occupy the fourth intercostal space.
- Change in th electric axis of the heart, so that false ECG changes develop that should be interpreted with much caution. ECHO cardiography is much more accurate to diagnose cardiac problems during pregnancy.
- Hemic murmures may be heared but not more than grade 2 and not associated with a thrill.
- Tachycardia.
- Splitting of the first heart sound.
- Symptoms of early pregnancy sometimes mimic symptoms of cardiac disease like shortness of breath, fatigability, syncope, lower limb edema...etc.

### Egypt profile in heart diseases with pregnancy

- ▶ The commonest are rheumatic heart disease.
- Rheumatic stenosis in 90% of the cases.
- Mitral regurge in about .6.5%
- Aortic stenosis in .2%
- ► Aortic regurge in .1%
- Less commonly affected tricuspid and pulmonary valves.
- Congenital heart diseases come next.



- Due to lack of routine checkup for asymptomatic women, heart diseases may be first diagnosed during antenatal care.
- Some families do not accept to declare that their daughters have cardiac problems before marriage.
- There is an increase in percentage of pregnant ladies with surgically corrected cardiac anomalies due to the dramatic improvement in cardiothoracic surgery.
- There is an increased chance of having pregnant ladies kept on anticoagulant after cardiac surgery.

### Possible symptoms of heart disease

- Progressive dyspnea.
- Orthopnea.
- Paroxysmal nocturnal dyspnea
- Nocturnal cough.
- Chest pain.
- ► Hemoptysis.



### Clinical findings of heart disease

- > Cyanosis, acrocyanosis.
- Clubbing of fingers.
- > Persistent neck veins distention.
- Systolic murmurs grade 3 or more.
- Diastolic murmurs.
- Thrills.
- Cardiomegally.
- Arrhythmia.
- Splitting of second sound.
- Pulmonary hypertension.



#### Investigation

- Adequate history taking.
- **ECG** cardiac arrhythmia and hypertrophy.
- ► ECHO CARDIOGRAPHY.
- > X-RAY Chest to show cardiomegally and vascular prominence.
- Cardiac catheterization rarely required.



#### New York Heart Association (NYHA) Functional grading of heart disease

- ► GRADE I: Asymptomatic with usual activity.
- ▶ GRADE II: Mild limitation of activity, symptoms with usual activity.
- GRADE III: Marked limitation of physical activity, symptoms with less than ordinary activity.
- ▶ GRADE IV: Dyspnea at rest.

### Classification of heart disease according to etiology

Congenital, either:

Cynotic -Eisenmengers syndrome. Fallots tetralogy Non cyanotic- ASD, VSD, Pulmonary stenosis, Coarctation of aorta.

Rheumatic heart disease: M.S., M.R., A.S., A.R.

Cardiomyopathy.

Ischemic heart disease.

Others: conduction defects, syphylitic, hypertensive. Thyrotoxic.



### Classification according to risk

- Low risk -ASD, VSD, PDA,M.S ( .Corrected F.T ,(1,2Where M.M. ,is between 0% to .1%
- 2. Medium risk- M.S( .Mitral stenosis with AF, A.S , (3,4And uncorrected FT.Where MM ranges between 5% and .15%
- 3. High risk where maternal mortality is between 25% and 50% as in Eisenmengers syndrome, Coarctation of the aorta with valve involvement and Marfans with aortic involvement..

#### Poor prognostic indicators

- 1. History of heart failure, ischemic attack, stroke.
- 2. Arrhythmias.
- 3. Base line NYHA class III, IV.
- 4. Mitral valve area below 2 cm square, A.V .Area less than 1.5 cm square.
- 5. Ejection fraction less than .40%



### Co-morbidities and additional risk factors

- 1. Anaemia.
- 2. Infection, especially chest infection.
- 3. Hypertension.
- 4. Physical labour.
- 5. Weight gain.
- 6. Multifetal pregnancy.
- 7. Caffeine, alcohol intake.
- 8. Pain.
- 9. Drugs, like tocolytics.



#### Effects of pregnancy on heart disease

- 1. Worsening of cardiac status.
- 2. Congestive cardiac failure.
- 3. Bacterial endocarditis.
- 4. Pulmonary edema, pulmonary embolism, rupture of an aortic aneurism.

#### Effects of cardiac disease on pregnancy

- 1. Abortion.
- 2. Preterm labor.
- 3. IUGR.
- 4. Increase the incidence of congenital heart diseases, 0.6% in normal population versus 4.5% if the mother has congenital heart disease, even if surgically corrected.



► MANAGEMENT OF HEART DISEASE DURING PREGNANCY

#### Prevention

- Care should be offered to girls and mothers to be in all their developmental stages.
- Early detection and accurate management of rheumatic fever, and aggressive treatment of cases of rheumatic carditis and do every effort to prevent the development of valve affection.
- Prophylaxis against the development of rheumatic carditis and SABE.
- Detection of congenital heart disease and adequate treatment during childhood.
- Family planning services should be readily available for mothers with cardiac problems.

#### Preconceptional counseling

- Pregnancy is inadvisable in high risk groups.
- Counseling should discuss maternal and fetal risks.
- Prognosis issues should be discussed clearly.
- Social and cost considerations should be discussed.
- It should be clear that delivery should be in a tertiary level facility.



### Termination of pregnancy should be considered in the following situations

- 1. In high risk group.
- 2. Better before 8 weeks.
- 3. Suction evacuation



#### Management strategy

- Requires:
- 1. High index of suspicion.
- 2. Timely diagnosis
- 3. Effective management.
- 4. Team approach.
- Obstetrition
- Cardiologist
- Anesthetists.
- Neonatologist.
- Cardiothoracic, vascular surgeon.
- Nursing staff.



#### Antenatal care

- Detailed history taking at booking.
- ▶ Basic investigations like CBC, ESR, URINE ANALYSIS, BLOOD GROUP and RH.
- CLINICAL evaluation to diagnose the type of heart disease, the level of risk, and the functional capacity of the heart, the NYHA grade.
- ANC every 2 weeks up to 30 weeks then weekly.
- On each visit note pulse, BP, CHEST examination, dyspnea, weight, anemia, and reevaluate the grade of NYHA.
- Ensure compliance to treatment.
- Exclude fetal congenital heart anomaly by level II USG and fetal ECHO at 20 weeks.
- Fetal monitoring.

#### Management plan

- Rest, avoid undue excitement and strain.
- Balanced diet, iron and vitamins.
- Hygiene, dental care to prevent any infection.
- Salt restriction.
- Avoid smoking, and drugs like betamimetics.
- Early diagnosis and treatment of any emerging co morbidity like PIH, GDM, Infections.
- Therapeutic/prophylactic cardiac interventions whenever needed:

Benzathin penicillin 1.2 million units every 3 weeks to prevent recurrence of rheumatic fever.

Diuretics, Beta blockers, digitalis, anticoagulants as required.

Surgical treatment if essential

#### Three critical occasions

- 1. Between 30 and 32 weeks.
- 2. Intrapartum, and immediately after delivery.
- 3. Five to seven days postpartum.



#### Indications for admission

- Elective admission:
- 1. NYHA I. 2 weeks before EDD.
- 2. NYHA II. 30 to,28 weeks.
- 3. NYHA III, IV as soon as patient comes.
- Emmergency admission:
- 1. Deterioration of functional grade.
- 2. Signs and symptoms of complications like fever, persistent cough, nasal reputations, pulse rate more than 100 BPM, Jugular venous pulse more than 2 cm, Anemia, infections, PET, Abnormal weight gain, and any other problem.

#### Labor and delivery

- ► Hospital delivery.
- Induction of labor:
- 1. only for obstetric indication.
- 2. Oxytocin preferred.
- 3. Intracervical volleys catheter for cervical ripening.
- 4. Prostaglandin E.may be used with caution,2



#### First stage of labor

- Confined to bed, semisitting.
- Intermittent oxygen inhalation 5 to 6 L/minute.
- Sedation and analgesia.
- Cautious use of fluids to avoid overload.
- Stop anticoagulant.
- Digitalis if CHF, Tachycardia more than minute/24 minute, RR more than/110
- > Diuretics in pulmonary congestion.
- Epiphyllin for bronchospasm.
- Prevention of infective endocarditis.
- Continuous hemodynamic monitoring.
- .cardiologist and competent anaesthetist care.

#### Prophylaxis against SABE

- Recommended for those with severe lesions and those at high risk of infection.
- Consists of ampicillin 2 gm IV/IM + GENRAMICIN 1.5 mg / kg, maximally 120 mg, 6 hours later 2 gm of ampicillin IM/IV or even orally.
- If allergic to penicillin give Vancomycin 2 gm IV, or clindamycin 600 mg IV + 1. 5mg/kg gentamycin

#### Second stage of labor

- Propped up or semirecumbant position.
- Avoid forceful bearing down.
- Adequate pain relief.
- Strict cardiovascular monitoring.
- Cut short the second stage, vacuum, forceps, episiotomy.



#### Third stage

- Active management of the third stage, use oxytocin.
- Propped up, oxygen inhalation.
- Frusemide IV if required.
- ▶ Look for CHF and Pulmonary edema.
- Urgent management of PPH.
- Sedation.
- Antibiotics.

#### Indications for C.S.

- Mainly for obstetric indication.
- Coarctation of the aorta.
- Mardan syndrome with dilated root of the aorta.
- Prefer Epidural.
- Narcotic conduction anslgesia/GA in pulmonary hypertension, and patients having intracranial catheters.

### Discharge and contraceptive advices

- Guard against infection.
- Better not to leave the hospital for one week.
- Encourage breast feeding.
- ▶ POP, IUCD, IMPLANTS.
- ▶ REASSESSMENT AFTER 6 WEEKS.





#### THANK YOU

