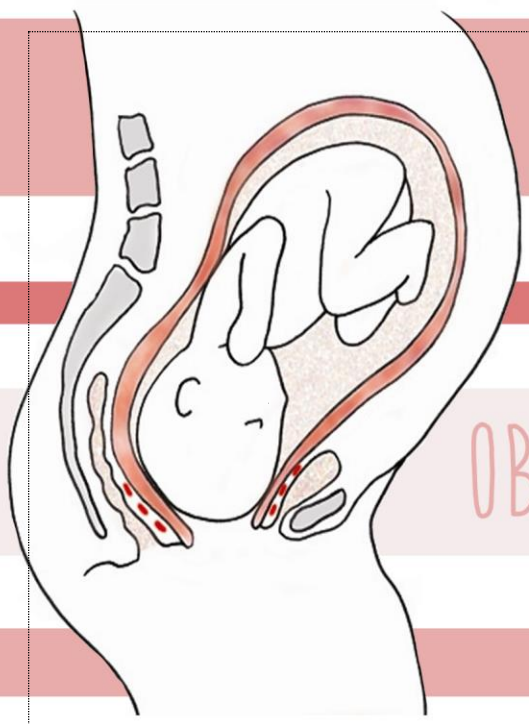


OBSTETRICS AND GYNECOLOGY

Medical and Endocrine diseases in pregnancy •

Leader: Alanoud Alyousef

Sub-leader: Dana ALdubaib

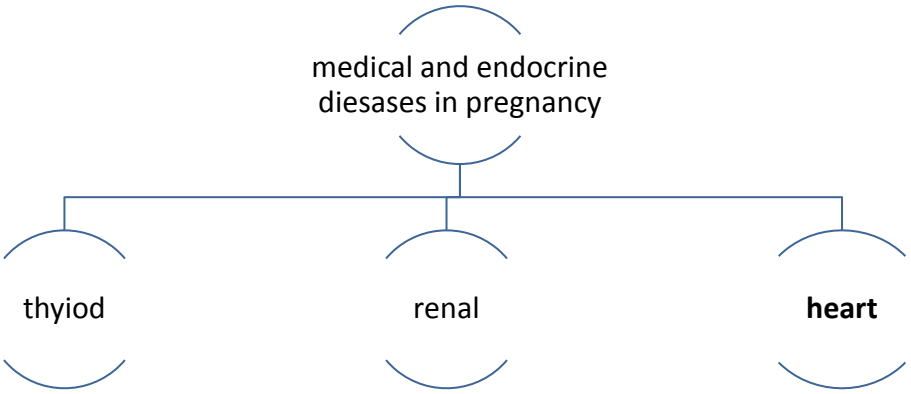
Done by: Shahd Saleh Al-Awwad

Revised by: Dana ALdubaib & Haifa Aldabjan

Doctor's note Team's note Not important Important

Objectives:

- Changes in thyroid function during preg
- Clinical manifestation, complications and treatment of hyper and hypothyroidism
- Postpartum thyroiditis
- To understand the normal physiological changes of CVS in pregnancy
- Symptoms and signs suggestive of CVS disease
- When to investigate for cardiac disease
- Types and grades of CVS disease
- Effect of pregnancy on CVS disease and effect of cardiac disease on pregnancy
- Pre-pregnancy counselling
- Management of CVS disease in pregnancy, labor and purperium


medical and endocrine diesases in pregnancy
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THYROID DISEASE IN PREGNANCY

Changes in thyroid function during pregnancy

- Increase TBG (estrogen effect)
- HCG acts like TSH –10-120% of pregnant women will have subclinical hyperthyroidism and 60% of women with hydatidiform mole or choriocarcinoma.
- Stimulation of TSH receptors
- Hyperemesis gravidarum may be associated with subclinical or mild hyperthyroidism.
- TSH---N
- FT4---N
- TT4---INCREASED
- TT3---INCREASED

Normal Thyroid Physiology during Pregnancy:
With the increase in glomerular filtration rate that occurs during pregnancy, the renal excretion of iodine Increase.

TFT: free T4 is the only accurate method for estimating TFT

Fetal thyroid function: By11 to 12 weeks, the fetal thyroid is able to produce Iodothyronines and T4, and by 12 to 14 weeks, it is able to concentrate iodine. Fetal thyroid-stimulating hormone (TSH), T4, and free T4 levels suggest that a mature, autonomous, thyroid-pituitary axis exists as early as 12 weeks' gestation.
PLACENTAL TRANSFER OF THYROID HORMONE: Iodide freely crosses the placenta, but TSH does not. Thyroid hormone analogues such as propylthiouracil and methimazole, with smaller molecular weights, cross the placental barrier and could potentially cause fetal hypothyroidism.
By Essentials of Ob\Gyn book

HYPERTHYROIDISM

CLINICAL MANIFESTATIONS

- Nervousness.
- Tachycardia.
- Palpitation.
- Weight loss.
- Tremors.
- Flushing.
- Frequent bowel movement.
- Excessive sweating.
- Insomnia.
- Heat intolerance.
- Graves' disease---goiter, exophthalmos and pretibial myxedema.

ETIOLOGY

- Graves' disease 90%
- Toxic nodular goiter
- Iatrogenic
- Iodine induced
- Subacute thyroiditis
- HCG mediated
- Hydatiform mole

PREGNANCY RELATED COMPLICATIONS

- Abortions and stillbirth
- PET
- Preterm delivery
- Low birth weight (IUGR)
- Placental abruption
- Cardiac arrhythmias
- Congestive heart failure
- Thyroid storm
- Hyperemesis gravidarum

DIAGNOSIS OF HYPERTHYROIDISM

- Low TSH
- Elevated FT4

MANAGEMENT

- Aim: to maintain FT4 level at the high normal range using the lowest drug dose.
- Radioactive Iodine is absolutely contraindicated in pregnancy
- Propylthyouracil 50 mg bid or less is recommended for the Rx (added advantage of blocking conversion of T4 to T3)
- If it fails consider methimazole (causes fetal gastrointestinal defects.)
- Beta blockers –given to control the symptoms
- Thyoidectomy may be required during pregnancy for women who can not tolerate drugs or have allergy or agranulocytosis (during second trimester only if medical treatment failed)

EFFECT ON THE FETUS

- TSH does not cross the placenta
- TSH (receptor stimulating) antibodies ---can cross the placenta ---resulting in hyperthyroidism of the fetus in 1-5%
- Manifestations of hyperthyroidism in the fetus:

- tachycardia

-Goiter

-Advanced bone age

-IUGR

-Cardiac failure /hydrops

*So reduce the Anti-thyroid drugs to the lowest dose

Thyroid Storm:

The major risk in a pregnant patient with thyrotoxicosis is the development of a thyroid storm. Precipitating factors include infection, labor, cesarean delivery, or noncompliance with medication. It is not uncommon to mistakenly attribute the signs and symptoms of severe hyperthyroidism to preeclampsia. The signs and symptoms associated with a thyroid storm include hyperthermia, marked tachycardia, perspiration, and high output failure or severe dehydration. Specific treatment is directed at (1) blocking **β**-adrenergic activity with propranolol, 20 to 80 mg every 6 hours; (2) blocking secretion of thyroid hormone with sodium iodide, 1 g intravenously; (3) blocking synthesis of thyroid hormone and conversion of T4 to T3 with 1200 to 1800 mg of PTU given in divided doses; (4) further blocking the deamination of T4 to T3 with 8 mg of dexamethasone per day; (5) replacing fluid losses; and (6) rapidly lowering the temperature with hypothermic techniques.

Neonatal Thyrotoxicosis

About 1% of pregnant women with a history of Graves' disease give birth to children with thyrotoxicosis due to transplacental transfer of thyroid-stimulating antibodies. Fetal thyrotoxicosis can be suspected if the baseline fetal heart rate consistently exceeds 160 beats/minute. A fetal goiter can often be identified by ultrasonography in such cases.

By essentials for Ob\Gyn book

HYPOTHYORIDISM

CLINICAL MANIFESTATIONS:

- Fatigue
- Constipation
- Cold intolerance
- Dry skin
- Muscle cramps
- Hair loss
- Weight gain
- Myxedema
- Carpal tunnel Syndrome
- Prolonged relaxation of deep tendon reflexes

ETIOLOGY

- Hashimoto disease
- Iodine deficiency
- Subacute thyroiditis
- Thyroidectomy
- Radioactive Iodine Rx

PREGNANCY RELATED COMPLICATIONS

- Abortions
- PET (preeclempsia)
- Preterm delivery

- IUGR
- Placental abruption
- PPH
- Lower intelligence level to the offspring

  hypothyroidism can cause mental retardation to baby

Diagnosis:

Elevated TSH level & low T3 & T4 level.

MANAGEMENT

- Levo-thyroxin " if mother hypothyroid you must increase dose"
- TSH should be checked and level adjusted

EFFECT ON THE FETUS

- Congenital cretinism 1:4000

---IUGR, MR, floppy baby, macroglossia, neuropsychological deficit

- Mental retardation
- IUGR
- Screening for hypothyroidism should be done for all neonates

Neonatal hypothyroidism:

The incidence of congenital hypothyroidism (cretinism) is about 1 in 4000 births. The etiologic factors include thyroid dysgenesis, inborn errors of thyroid function, and drug-induced endemic hypothyroidism. The most common cause of neonatal goiter is maternal ingestion of iodides present in cough syrup. By essentials for OB\GYN book

Postpartum thyroiditis:

- It occurs in 5-10% of women in the first year after child birth
- There is increasing serum levels of autoantibodies

- Phase 1—thyrotoxicosis 1-4 months after delivery—may return to euthyroid state.
- Phase 2—transient or permanent hypothyroidism 4-8 months post delivery
- Diagnosis ---abnormal TFT

  -Antimicrosomal antibodies.

  -ATP (antithyroid peroxidase) antibodiess

THYROID NODULE OR CA

- Fine needle aspiration biopsy
- Benign nodules followed
- Malignant –surgery in the 2nd trimester
- Thyroid radioactive scanning is contraindicated

CARDIAC DISEASE IN PREGNANCY

Hemodynamic changes during pregnancy

- Starts around 5-8 weeks of pregnancy
- Peak at late second trimester 20-24 weeks
- Symptoms ad signs due to these changes include fatigue, dyspnea, decreased exercise capacity, peripheral edema, physiologic systolic murmur and 3rd heart sound

Hemodynamic changes during pregnancy

A-blood volume

- Increase 40-50% up to 32 weeks
- Plasma volume increase (50%) more then RBC mass (20%) resulting in physiologic anemia

B-Cardiac output

- Rises 30-50% (max 20 weeks)
- By increased blood volume, reduced systemic vascular resistance and increase maternal heart rate by 10-15 BPM . Stroke volume increase in 1st and 2nd trimester and decrease in the third trimester

C- Slight decrease in BP (diastolic reduced more than systolic)

D-Labor and delivery

- Each uterine contraction result in displacement of 300-500 cc of blood to the general circulation ----increase stroke volume and cardiac output by about 50%
- BP & HR increase due to pain and anxiety
- Blood loss during delivery –compromise the hemodynamic state

E-Postpartum

- Relieve of vena caval compression by the gravid uterus ----- increase venous return ---increase cardiac output 10-20 %--- diuresis

F-Changes due to epidural anesthesia

Peripheral vasodilation----decrease cardiac output & BP / therefore Pt. need rehydration

Symptoms and signs of cardiac disease in pregnancy

There is overlap with the common symptoms of pregnancy

- Fatigue
- Dyspnea
- Orthopnea
- Palpitation

- ⊡ Edema
- ⊡ Systolic flow murmur
- ⊡ 3rd heart sound

Symptoms that merit a cardiac evaluation in pregnancy

- ⊡ Progressive limitation of physical activity
- ⊡ Chest pain
- ⊡ Syncope

Evaluation

- ⊡ History and physical exam
- ⊡ ECG
- ⊡ Chest radiogram
- ⊡ Echocardiogram

NYHA functional classification

New York Heart Association (NYHA) Classification of Heart Failure

Class	Patient Symptoms
Class I (Mild)	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea).
Class II (Mild)	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea).
Class III (Moderate)	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea).
Class IV (Severe)	Unable to carry out any physical activity without discomfort. Symptoms of fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea) are present at rest. If any physical activity is undertaken, discomfort increases.

Management

A- Before conception

- Should be informed about the added risk of pregnancy on her self & the fetus" have risk of preterm delivery"
- Class III and IV ---mortality rate up to 7% and morbidity 30% -----should be cautioned against pregnancy " class 3 & 4 we do elective C-section"
- Factors that predict the woman chance of having adverse cardiac or neonatal complication:

1-a prior cardiac event 2-cyanosis or poor functional class 3-Valvular or outflow tract obstruction 4-myocardial dysfunction (LVEF<40% cardiomyopathy)" Red flag"

Management after conception

- Cardiac assessment as early as possible (by cardiologist)
- Termination of pregnancy if there is a serious threat to maternal health" ex: cardiomyopathies or previous cardiac surgery"
- Close follow up by both obstetrician and cardiologist
- Observe for signs and symptoms of heart failure

Antibiotic prophylaxis for endocarditis

- American Heart Association published a consensus statement that there is no need for antibiotics prophylaxis (to prevent B E in patient with cardiac lesions) for vaginal delivery nor cesarean section as the risk of bacteremia is low 1-5%
- IV antibiotics can is optional if bacteremia is suspected or for high risk patients (prosthetic cardiac valve, previous BE" bacterial endocarditis" , complex cyanotic congenital HD, surgical pulmonary shunts or conduits, VSD, PDA)
- Ampicillin 2 gm + Gentamicin 1.5 mg/kg within 30 minutes of procedure followed by Ampicillin 1 gm after 6 hours

Specific cardiac conditions

1-Cardiomyopathy(CMP)

- Look for symptoms and signs of congestive heart failure(CHF)
- Heart failure is often refractory to treatment
- Serious condition with 5 year survival rate of 50%

2-Peripartum cardiomyopathy

- Dilated CMP occurs in late pregnancy or first 6 months post partum
- Incidence 1:1300-15000
- Unknown cause
- Mortality 25-50% due to CHF, thrombo-emoblism or arrhythmia
- Need intensive monitoring and treatment during pregnancy and labor by cardiologist and OB
- This entity is rare but occurs exclusively during pregnancy. Patients have no underlying cardiac disease, and symptoms of cardiac decompensation appear during the last weeks of pregnancy or within 6 months postpartum. Pregnant women particularly at risk for developing cardiomyopathy are those with a history of preeclampsia or hypertension and those who are poorly nourished.*By essentials OB\GYN book.

3-Septal defects ASD VSD

- Usually tolerate pregnancy well
- ASD most common congenital lesion
- ASD can cause atrial flutter . Rx after preg by catheter ablation
- Rarely uncorrected lesions lead to Lt to Rt shunt, pulmonary HPT and CHF

- Fetal echocardiography ----incidence of VSD 4%

4-Patent ductus arteriosus

- Well tolerated in pregnancy unless there is pulmonary HPT

5-Mitral regurgitation

- Usually well tolerated in preg except in Pt with atrial fibrillation or severe HPT
- Pt with severe MR should be advised surgical correction before pregnancy

6-Mitral prolapse

- Most common congenital defect
- Rarely have any implications on maternal fetal health

7-Aortic Regurgitation

- Generally well tolerated
- Severe disease should have surgical repair before pregnancy

8-Aortic stenosis

- Mild-mod well tolerated in preg
- Severe ---deteriorate in 2nd or 3rd trimester ---dyspnea, angina, syncope or CHF
- May require balloon valvuloplasty in pregnancy
- Monitoring with SG-Catheter "Swan ganz "in labor
- No epidural " Because you induce hypotension in already hypo perfused pregnancy"
- Instrumental delivery to shorten the second stage
- Mortality 17% Any hypotension can cause sudden death

- Postpartum blood loss ---reduce preload and volume resuscitation is necessary" Don't give too much fluid because of congestive heart failure "

9-Mitral Stenosis

- Moderate to severe disease often show deterioration in third trimester or labor---increased blood volume & heart rate---pulmonary edema
- Atrial fibrillation ---Cardiac failure
- Normal vaginal delivery with swan ganz catheter monitoring in severe /mod cases
- Needs good pain relief in labor to reduce maternal heart rate and increase diastole
- Can not tolerate the 2nd stage because of decreased preload with pushing therefore require instrumental delivery to shorten the 2nd stage
- Post partum autotransfusion can result in pulmonary oedema ---requires aggressive diuresis

10-Congenital Lesions

A- Tetralogy of Fallot (Rt to Lt shunt &cyanosis):

- Rt ventricular outflow obstruction
- VSD
- Rt Vent hypertrophy
- Overriding Aorta

Complications

- Heart failure 40%
- Spontaneous abortions & preterm labor

- IUGR
- Shunt worsen in labor & postpartum
- Invasive cardiac monitoring in labor

B-Eisenmenger's Syndrome:

Communication between pulmonary & systemic

circulation (eg large VSD)

- Lt to Rt shunt-----pulmonary HPT ----Rt to LT shunt
- Termination of pregnancy advisable
- MMR ---50% PP death one wk after delivery up to 4-6 wks
- FMR---50%
- IUGR 30%
- Preterm delivery 85%
- During preg ---Rx limitation of physical activity, oxygen, pulmonary vasodilators
- Risk of death is greatest during labor & early postpartum
- Requires central hemodynamic monitoring in labor & instrumental delivery

C-Coarctation of the Aorta:

Surgical correction in pregnancy only if dissection occurs

They have fixed cardiac output therefore maintain demand of preg by increasing heart rate

D-Marfan's Syndrome:

- Congenital weakness of the connective tissue
- Aortic root dilatation / mitral valve prolapse/ Aneurisms

- ⊡ Sever cases---complications in preg / aortic dissection or rupture
- ⊡ Aortic valve replacement before pregnancy
- ⊡ Avoid HPT /B blockers from 2nd trimester to avoid tachycardia
- ⊡ Delivery controversial –CS Vs SVD

E- Idiopathic Hypertrophic Subaortic stenosis:

- ⊡ Lt Vent outflow tract obstruction
- ⊡ Worsen in the late 2nd /3rd trimester
- ⊡ Lt ventricular failure
- ⊡ Supraventricular arrhythmias

F-Ebstein's anomaly:

- Malformation of the Tricuspid valve
- Surgical correction before preg

G-Congenital atrioventricular block:

- ⊡ Pacemaker/ tolerate preg well

11-Arrhythmias:

Supraventricular tachycardia is the most common

- ⊡ Premature atria/ventricular complexes –no adverse outcome in preg
- ⊡ Atrial fibrillation/flutter ---rare in preg

Rx digoxin & B blockers

- ⊡ Serious arrhytmias should be treated before preg

12-Ischemic heart disease:

- ⊡ Uncommon in preg

- 67% occure in 3rd trimester
- If MI occurs before 24 wks ---termination of preg
- If delivery occurs within 2 wks of MI ---mortality 50%

CVS drugs IN PREGNANCY

Class B: No risk in controlled animal studies

A.Anticoagulants :

Enoxaparin (Lovenox) ,

Dalteparin (Fragmin)

Danaparoid (Orgaran),

Heparin

B. Antihypertensives:

1.Methyldopa (Aldomet)

2.Acebutolol (first trimester only)

3.Pindolol (first trimester only)

C.Antiarrhythmic

1.Encainide 2.Sotalol (Betapace) - first trimester only

D.Diuretics:

1.Torsemide (Demadex) 2.Amiloride

E.AntiHyperlipidemic:

1.Cholestyramine 2.Colestipol

Class C: Small risk in controlled animal studies

A.Antiplatelet Medications:

1.Clopidogrel (Plavix) 2.Dipyridamole (Persantine) 3.Ticlopidine

B.Antiarrhythmic:

1.Atropine 2.Digoxin 3.Disopyramide (Norpace)

4.Lidocaine 5.Procainamide 6.Quinidine

7.Amiodarone

(a.Neonatal Hypothyroidism , b.Intrauterine Growth Retardation c.Cardiac disturbance

C.Diuretics

1.Acetazolamide (Diamox)2.Furosemide (Lasix)3.Mannitol

D.Lipid lowering medications:

1.Niacin 2.Gemfibrozil (Lopid)

E.Antihypertensive:

1.Hydralazine 2.Diazoxide 3.Clonidine 4.Nitroprusside (Nipride)" "we give it in malignant hypertension" 5.Prazosin 6.Reserpine

7.All Calcium Channel Blockers

a.Nifedipine XL (is a drug of choice for severe Hypertension in Pregnancy)

b.Avoid other Calcium Channel Blockers in pregnancy

8.Most Beta Blockers (first trimester only)

a.Labetolol (drug of choice for severe Hypertension in Pregnancy)

b.Metoprolol c.Nadolol d.Propranolol e.Timolol

f.Esmolol (Class C in all trimesters)

Class D: Strong evidence of risk to the human fetus

A.Anticoagulants

1.Coumadin (Warfarin) 2.Dicumarol

B.Antihypertensive

1.**ACE Inhibitors** 2.Angiotensin II Antagonists

3.Most Beta Blockers (second and third trimester)

a.Associated with Intrauterine Growth Retardation

b.Metoprolol c.Nadolol d.Propranolol e.Timolol

f.Acebutolol (second and third trimester) g.Pindolol (second and third trimester) h.Atenolol

C.Diuretics

1.Ethacrynic Acid 2.Triamterene (Class B per manufacturer)
3.Bumetanide (Bumex) 4.Hydrochlorothiazide **5.Spironolactone**

Rheumatic heart disease:

patients are at higher risk for developing heart failure, subacute bacterial endocarditis, and thromboembolic disease. Asymptomatic patients may develop symptoms of cardiac decompensation or pulmonary edema as pregnancy progresses

Management of Cardiac Disease during pregnancy:

risks are greatly increased with class III and IV disease or if there is cyanosis.
However, the type of defect is important as well. Mitral stenosis and aortic stenosis carry a higher risk for decompensation than do regurgitant lesions. Other patients at high risk include those with significant pulmonary hypertension, a left ventricular ejection fraction less than 40%, Marfan syndrome, a mechanical valve, or a previous history of a cardiac event or arrhythmia.

1)Prenatal management: Avoidance of excessive weight gain and edema by low sodium diet. If there is evidence of chronic left ventricular failure not adequately treated with sodium restriction, a loop diuretic and β blockers should be added. Aldosterone antagonists should be avoided because of their potential antiandrogen effects on the fetus.

2)Avoidance of strenuous activity

3)Avoiding anemia:

With anemia, the oxygen- carrying capacity of the blood decreases. Oxygen delivery to tissues is generally maintained by increased cardiac output. An increase in heart rate, especially with mitral stenosis, leads to a decrease in left ventricular filling time, resulting in pulmonary congestion and edema.

4)Anticoagulation :

Women with mechanical valves require full anticoagulation with heparin in pregnancy. Warfarin may be restarted post partum.

5)Management of delivery and immediate postpartum period:

Cardiac patients should be delivered vaginally unless obstetric indications for cesarean are present. They should be allowed to labor in the lateral decubitus position Pushing should be avoided during the second stage of labor because the associated increase in intraabdominal pressure increases venous return and cardiac output and can lead to cardiac decompensation. The second stage of labor can be assisted by performing an outlet forceps delivery or by the use of a vacuum extractor.

Antibiotic prophylaxis:
is only recommended for high-risk patients (e.g., prosthetic valves, unrepaired or incompletely repaired congenital heart disease, congenital heart disease repaired with prosthetic material, previous history of bacterial endocarditis and valvulopathy in heart transplants) if bacteremia is suspected (such as in the setting of chorioamnionitis).

***ACUTE CARDIAC DECOMPENSATION with Congestive heart failure :**

should be managed as medical emergency Medical management may include administration of morphine sulfate, supplemental oxygen, and an intravenous loop diuretic (e.g., furosemide) to reduce fluid retention and preload. β Blockers should not be used in the setting of acute heart failure. Vasodilators such as hydralazine, nitroglycerin Angiotensin-converting enzyme inhibitors are contraindicated in pregnancy. Calcium channel blockers such as nifedipine may accelerate the progression of congestive heart failure and should be avoided. By essentials for OB\GYN book

Renal DISEASE IN PREGNANCY

Physiological changes of pregnancy affecting the renal system:

- Renal blood flow increased 75%
- GFR increased 50% ---reduced creatinine, BUN, uric acid
- Progesterone—reduces ureteral tone(dilated ureters) and peristalsis

  -relaxes bladder wall

  -reflux

-Stasis of urine

-bacterial prollferation ---Bcteriurea or

UTI and pyelonephritis

- Hydronephrosis more on the Rt due to preduure of the gravid uterus which is dextrorotated
- Plasma osmolality reduced due to increased intravascular fluid---- pitting oedema
- Glucosuria is normal in pregnancy

CHRONIC RENAL DISEASE:

- Effect of pregnancy on chronic renal disease:
- Mild creatinine <1.4mg/dl----pregnancy should not cause worsening of renal function
- Mod-severe renal diseass—creatinine >1.4-2.5 (especially if accompanied by hypertension or nephrotic syndrome)
- Deterioration of renal function that may not improve after delivery

EFFECT OF CHRONIC RENAL DISEASE ON PREGNANCY

- Abortions
- IUGR
- PET"preeclampsia"
- Preterm delivery
- Perinatal mortality

PROTEINUREA

- Nephrotic syndrome –proteinuria >3.5 gm/24 hrs
- Prognosis depends on gestational age at diagnosis and etiology of proteinuria glomerulonephritis, SLE, DM, minimal change disease)
- Some conditions respond to steroids
- PET is the most common cause of nephrotic range proteinuria

Acute renal Failure:

With prerenal causes, a history of blood or fluid loss, such as occurs with obstetric hemorrhage, is usually apparent or can be elicited. Renal causes are usually suspected in a patient with a history of preexisting renal disease or with a hypercoagulable state, such as thrombotic thrombocytopenic purpura or hemolytic-uremic syndrome Prolonged hypotension can lead to acute cortical necrosis or acute tubular necrosis. Postrenal causes are less common but should be suspected in situations in which urologic obstructive lesions are present or in which there is a history of kidney stones.

Laboratory studies:

1)Renal: Renal studies include urine output, blood urea nitrogen (BUN)-to-creatinine ratio, fractional excretion of sodium, and urine osmolality. Oliguria is defined as urine output of less than 25 mL/ hour, Urine osmolality greater than 500 mOsm/L or a urine-to-plasma osmolality ratio greater than 1.5:1 is highly suggestive of renal hypoperfusion.

2)Cardiovascular:

a Swan-Ganz catheter allows monitoring of right and left ventricular filling pressures, cardiac output, and pulmonary capillary wedge pressure. This can help to distinguish between congestive heart failure, cardiac tamponade, and volume depletion, any of which can lead to acute renal failure.

3)urological studies:

A Foley catheter and renal sonogram are usually sufficient to diagnose obstructive lesions. It is important not to mistake the physiologic hydronephrosis of pregnancy for true obstruction.

Treatment:

Prerenal: Restoration of intravascular volume, Careful attention should be given to electrolyte imbalance when large amounts of crystalloids are infused.

Renal: cortical necrosis is generally irreversible, treatment is directed toward preventing further damage. acute tubular necrosis and increase survival rates by Furosemide. If the diuretic therapy fails to increase the urine output, an oliguric fluid regimen (<500 mL/24 hr) is initiated. Fluid intake should be limited to replacement of urine output and insensible water loss. If renal function deteriorates rapidly or fails to recover, hemodialysis is recommended

Postrenal: In many instances, simple measures, such as turning the patient on the left side to displace the gravid uterus away from the ureters, or inserting a Foley catheter into the bladder to overcome urethral obstruction, will resolve the problem. In situations in which a ureteral or renal pelvic obstruction is present (e.g., stones), surgical intervention is indicated to relieve the obstruction

RENAL FAILURE

- It will significantly reduce fertility" due to inappropriate hormones and due to toxic effect of creatinine in hypothalamus"
- If they do become pregnant will require more dialysis hours
- Complications:

  -Abortions

  -IUFD

  -IUGR

  -PRETERM DELIVERY

RENAL TRANSPLANT PATIENTS

- Immunosuppressive Rx should not be stopped after conception
- Malformations are not increased
- Cyclosporine—IUGR
- Allograft rejection same as non pregnant 9%
- Complications :

  -PET 30%

  -IUGR 20%

  - Abortions

  -IUFD

  -Preterm delivery 45%

Should be screened frequently for UTI and Rx

-Renal function may decrease in up to15% of pt in late preg

Pregnancy following renal transplantation:

Hypertension (up to 70%) and preeclampsia are common in women with renal transplantation

Fetal complications include steroid-induced adrenal and hepatic insufficiency, prematurity, and IUGR

The mother and neonate are at increased risk for infection because of immunosuppressive therapy. Patients who are good candidates for pregnancy are those who are 1 to 2 years posttransplantation, have stable renal function (serum creatinine < 1.5 and proteinuria < 500 mg/day), are not significantly hypertensive, and are on low doses of prednisone and stable doses of azathioprine and cyclosporine. These medications do not appear to have significant teratogenic effects, but long-term consequences on growth, immune function, and neurocognitive development are unknown. Cyclosporine may have adverse maternal consequences, including a rise in blood pressure, a decline in renal function, hyperkalemia, hyperuricemia,and less frequently, hemolytic-uremic syndrome.

Summery

HYPERTHYROIDSM

Symptoms:

- ✓ Palpitation
- ✓ Heat intolerance
- ✓ Weight loss
- ✓ Tremors

Lab:

- ✓ Elevated FT4
- ✓ Low TSH

Treatment:

Propylthyouracil

The major risk in a pregnant patient with thyrotoxicosis is the development of thyroid storm. Treat pregnant lady with propranolol, Na iodide and PTU

HYPOTHYROIDSM

Symptoms:

- ✓ Fatigue
- ✓ Constipation
- ✓ Cold intolerance

Lab:

- ✓ Low FT4
- ✓ High TSH

Treatment:

Levo-thyroxin

CARDIAC DISEASE

- **Symptoms that merit a cardiac evaluation in pregnancy:**
  - ✓ Progressive limitation of physical activity
  - ✓ Chest pain
  - ✓ Syncope

- **CVS drugs in pregnancy:**
  Labetolol (drug of choice for severe Hypertension in Pregnancy)
- **Drugs contraindicated in pregnancy:**
  - ✓ ACE Inhibitors
  - ✓ Spironolactone
  - ✓ Propranolol
  - ✓ Bumetanide
  - ✓ Warfarin

MCQ's

1) You are called in to evaluate the heart of a 19-year-old primigravida at term. Listening carefully to the heart, you determine that there is a split S_1, normal S_2, S_3 easily audible with a 2/6 systolic ejection murmur greater during inspiration, and a soft diastolic murmur. You immediately recognize which of the following?

a. The presence of the S_3 is abnormal.
b. The systolic ejection murmur is unusual in a pregnant woman at term.
c. Diastolic murmurs are rare in pregnant women.
d. The combination of a prominent S_3 and soft diastolic murmur is a significant abnormality.
e. All findings recorded are normal changes in pregnancy.

2) A 37-year-old G3P2 presents to your office for her first OB visit at 10 weeks gestation. She has a history of Graves disease and has been maintained on propylthiouracil (PTU) as treatment for her hyperthyroidism. She is currently euthyroid but asks you if her condition poses any problems for the pregnancy. Which of the following statements should be included in your counseling session with the patient?

a. She may need to discontinue the use of the thionamide drug because it is commonly associated with leukopenia.
b. Infants born to mothers on PTU may develop a goiter and be clinically hypothyroid.
c. Propylthiouracil does not cross the placenta.
d. Pregnant hyperthyroid women, even when appropriately treated, have an increased risk of developing preeclampsia.
e. Thyroid storm is a common complication in pregnant women with Graves disease.

ANSWERS

1) E , Numerous changes occur in the cardiovascular system during pregnancy. Heart rate increases by about 10 to 15 beats per minute. Blood volume and cardiac output increase significantly. All the findings listed in the question are normal. An exaggerated splitting for the first heart sound occurs with increased loudness of both components. Also a loud third heart sound can be easily heard. Ninety percent of pregnant women have systolic ejection murmurs. In approximately 20% of women, a soft diastolic murmur can be heard. Ten percent of women may have a continuous murmur arising from the breast vasculature.

2) B , Hyperthyroidism in pregnancy is treated with thionamides, namely, propylthiouracil (PTU) and methimazole. Transient leukopenia occurs in about 10% of patients taking thionamide drugs, but does not necessitate stopping the medication. Agranulocytosis which is a rare

complication necessitates discontinuation of the drug. Fetal exposure to thionamides, which can cross the placenta, may case goiterous hypothyroidism. Women who remain hyperthyroid despite therapy have a higher incidence of preeclampsia and heart failure. Thyroid storm occurs only rarely in untreated women with Graves disease. This emergent medical condition involves thyrotoxicosis, which is characterized by fever, tachycardia, altered mental status, vomiting, diarrhea, and cardiac arrhythmia.