# Renal Diseases with Pregnancy

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# Learning Objectives

**By the end of this subject, the student will be able to:**

- **List the physiological changes of pregnancy**
- **Mention the incidence of urinary tract infection with pregnancy.**
- **Enumerate its Predisposing factors.**
- **Mention its Presentation.**
- **Mention its Diagnosis.**
- **Mention its Treatment**
- **Short notes on: renal impairment, renal transplant& acute renal failure.**

# Physiological changes in pregnancy

- **Ureters and renal calyces:** dilatation (remembered in U/S).
- ↑ **Renal plasma flow** + **Glomerular filtration** → ↑ urinary protein excretion and ↑ creatinine clearance. So:-
- The upper limit of serum creatinine clearance falls **65 µmol/L.**
- The upper limit for proteinuria throughout pregnancy is **300mg/24 hours.**

# Urinary tract infection

- **Incidence:**

- It is **more common** in pregnancy due to physiological dilatation of the upper urinary tract.
- **Asymptomatic bacteriuria**: 4-7%, 40% of them will develop symptomatic UTI.
- **Cystitis**: 1% of pregnancies.
- **Pyelonephritis**: 1 - 2% of pregnancies.

## Predisposing factors:

- previous history of UTI.
- Diabetes millets, polycystic kidneys, urinary tract calculi, urinary tract abnormalities (duplex kidney or ureter)
- Neuropathic bladder (spina bifida or multiple sclerosis).
- Drugs: steroids or immuno-suppressives.

## Presentation

- **Asymptomatic**: Asymptomatic bacteriuria + patients with predisposing factors: midstream urine specimens (antenatal screening).
- **Symptomatic**: Clinical features include:

- **Cystitis**: urinary frequency, dysuria, haematuria, protienuria and suprapubic pain.
- **Pyelonephritis**: fever, loin pain and/or abdominal pain, vomiting and rigors.

# Diagnosis

- **Dipstick for proteinuria.**
- **MSU for analysis. Bacteriuria: 100000 organisms/ml of urine or more**
- **MSU for culture and sensitivity. It should be repeated if it is non-significant or with mixed growth.**

# Treatment

- **Asymptomatic bacteriuria: a 3-day course of antibiotics (oral) to prevent pyelonephritis + preterm labour.**
- **Acute cystitis: a 7-day course of antibiotics (oral).**

- **Urine culture following treatment to ensure eradication of organisms. Recurrent bacteriuria occurs in 15% of women in pregnancy and requires a second course of antibiotics.**
- **U/S: in patients with 2 or more UTIs (+ve culture).**

# management

- **Pyelonephritis:**

- antibiotics for 10-14 days.
- IV antibiotics for patients with vomiting or pyrexia.
- IV fluids may be required.
- renal function should be checked.
- U/S to exclude hydronephrosis, renal calculi and congenital abnormalities (risk factors).

- **prophylactic antibiotics**: two or more UTIs (positive culture) i.e. recurrent UTI or one of the above risk factors.

# Treatment regimens for UTI in pregnancy

- **Oral antibiotics**:
  - amoxicillin 500 mg tds.
  - Cefadroxil 500mg bd.

- **IV antibiotics for pyelonephritis**:
  - Cefuroxime 750mg tds
  - Augmentin 1gm tds

**Prophylaxis of UTI:**

- Cephalexin 250 mg od.
- amoxicillin 250 mg od.

# Renal Impairment

- Aetiology:

1. reflux nephropathy
2. diabetes
3. systemic lupus erythromatosus (SLE)
4. Glomerulonephritis.
5. polycystic kidney disease.

- Classification: mild, moderate or severe depending on the serum creatinine.

creatinine depends on the muscle mass i.e. a figure representing moderate impairment in an 85-kg may represent severe impairment for a 50-kg woman.

- **Presentation**:

  hypertension and protienuria ± haematuria in early pregnancy. Blood tests for urea and creatinine must be done.

- **Effect of pregnancy on renal impairment:**

- mild impairment (creatinine < 125 µmol/l): tolerate pregnancy well with no renal function deterioration.

- severe renal impairment (creatinine > 250 µmol/l): at increased risk of permanent loss of function during and after pregnancy and even end stage of renal failure.

## Effect of renal impairment on pregnancy :

1. PET, IUGR, spontaneous and iatrogenic premature delivery.

- severe renal impairment + hypertension have < 50 % chance of successful pregnancy because of severe, early-onset of PET with severe IUGR.

- premature delivery is justified in rapidly worsening renal function to avoid dialysis even in the absence of PET.

2. severe renal impairment → polyhydramnios and risk of cord prolapse due to fetal polyuria in response to high osmotic load from increased maternal urea.

3. nephrotic syndrome and heavy protienuria → severe hypoalbuminria with associated risks of pulmonary oedema and thrombosis

# management of renal impairment

- prepregnancy counseling and multidisciplinary care.
- Documenting baseline values (prepregnancy & early pregnancy) for creatinine, uric acid, albumin and protein.
- Tight control of even mild hypertension with antihypertensive agents (the choice is no different in women with renal disease).
- discontinue angiotensin-converting enzyme (ACE) inhibitors prior to pregnancy or once pregnancy is confirmed.
- Discontinue: diuretics unless there is severe hypoalbuminaemia and insipient pulmonary oedema.
- Admission: in worsening hypertension, increasing creatinine, and large increase in proteinuria because of high risk of PET with difficult diagnosis in the present of ↑ BP + proteinuria.

# management of renal impairment

- **Diagnosis of PET is supported by: IUGR, thrombocytopenia and abnormal liver function.**
- **Prophylactic low-dose(75 mg/day) aspirin to decrease the risk of PET.**
- **Serial scans for fetal growth and liquor volume.**
- **Serial haematology and biochemistry.**
- **If renal impairment discovered in pregnancy; not attribute it directly to PET but do: blood glucose (for diabetes), urinary tract U/S (e.g. for polycystic or small kidney suggesting chronic renal failure) and antinuclear antibodies (for SLE).**
- **Post partum: continue close monitoring. ACE inhibitors are safely used in breastfeeding.**

# Renal transplants

- **Pregnancy outcome** in well functioning renal transplants is similar to the general population.
- **Pregnancy** should be **delayed for 1-2 years** to allow graft function to stabilize and immunosuppression to reach maintenance levels.
- **Risks in pregnancy**: is related to pre-pregnancy renal function and to the presence of hypertension.
- Women are immunosuppressed and prone to infection.
- **Immunosuppressive drugs** used in pregnancy: prednisolone, azathioprine, cyclosporine and tacrolimus.
- Women using cyclosporine and tacrolimus are advised not to breastfeed.

# Dialysis

- pregnancy on dialysis is unusual: end-stage renal failure reduces fertility.
- Patients on dialysis should be advised not to get pregnant.
- Common risks: anaemia and haemorrhage.
- Increased risks of:

  miscarriage, fetal death, pre-eclampsia, pre-term labour, PROM, polyhydramnios and placental abruption.
- Pregnant women require increasing dialysis to maintain the pre-dialysis urea < 15-20 mmol/l.
- Poor obstetric outcome is similar with both haemodialysis and peritoneal dialysis.

# Acute renal failure

- It is **rare** in pregnancy.
- **Commonest causes**: pre-eclampsia, haemorrhage, infections, drugs (NSAID) and obstruction due to ureteric damage or stones.
- Most commonly complicates early post partum period.
- **Characterized by**: oliguria, a rising urea and creatinine, metabolic acidosis and hyperkalaemia.
- In obstetrics there may be an associated coagulopathy.
- A rise in urea (without concomitant rise in creatinine) is observed following antenatal corticosteroid administration.
- **haemolytic uraemic syndrome**: rare cause, occurs postpartum, associated with renal failure + thrombocytopenia. characterized by microangiopathic haemolytic anaemia (diagnosed on blood film).

# Important points:

- UTI → maternal morbidity + perinatal morbidity via Prematurity.
- Renal disease → PET + IUGR.
- Hypertension + proteinuria in first or early second trimester suggest pre-existing renal disease.
- Serum creatinine is mandatory to exclude pre-existing renal disease.


thanks