Proteinuria in Pregnancy

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Introduction:
Urinalysis is a common test undertaken within maternity, primarily as screening for pre-eclampsia. This is a significant condition to detect and defined as hypertension after 20 weeks gestation with either significant proteinuria (urinary PCR >30 g/L) or evidence of organ dysfunction including placental, and its investigation and management is in its own guideline. In a healthy pregnancy the amount of urinary protein doubles in response to the physiological adaptations (increase in renal plasma flow and glomerular filtration rate). Around 7% of pregnancies will have proteinuria without hypertension and this guideline outlines investigation and initial management for proteinuria without evidence of pre-eclampsia.

Causes of proteinuria in pregnancy

- Urinary tract infections. A common complaint of pregnancy. In the presence of symptoms (such as frequency, dysuria and offensive smelling urine) antibiotics should be given. Infection can be confirmed by sending urine for microscopy and culture. Asymptomatic screening for urinary infections is no longer recommended except in high risk patients.

- Functional proteinuria. Proteinuria can be as a result of vaginal discharge, excessive exercise, dehydration, fever or emotional distress. It can also occur following administration of steroids for fetal lung maturity. This should be a transient finding.

- Acute Kidney Injury. This can occur secondary to sepsis, haemorrhage, pre-eclampsia, HELLP (haemolysis, elevated liver enzymes and low platelets), Acute Fatty Liver of pregnancy or amniotic fluid embolism. Management is often supportive with treatment of the underlying cause.

- Chronic renal disease. This can be a primary renal disease such as glomerulonephritis, or secondary to other conditions such as diabetes, connective tissue disease, hypertension or vasculitis. This can be a new presentation of disease, especially where there is persistent proteinuria before 20 weeks. A detailed history including family history of disease, and symptoms of potential underlying conditions, is required. This should include the presence of leg swelling, weight change, arthralgia and skin rashes or mouth ulcers, as well as any medication taken including over the counter and herbal medication (such as NSAIDs). Examination includes for splinter haemorrhages, joint swelling, rashes, oedema, muscle wasting, abdominal bruits, cardiac murmurs, and organomegaly.

- Pre-eclampsia. Whilst usually hypertension is the first indicator of pre-eclampsia proteinuria can be the primary presentation. Around 30% of pregnant women who have proteinuria will go on to develop pre-eclampsia during their pregnancy, and can occur superimposed on other reasons for proteinuria. It is therefore important to continue surveillance.

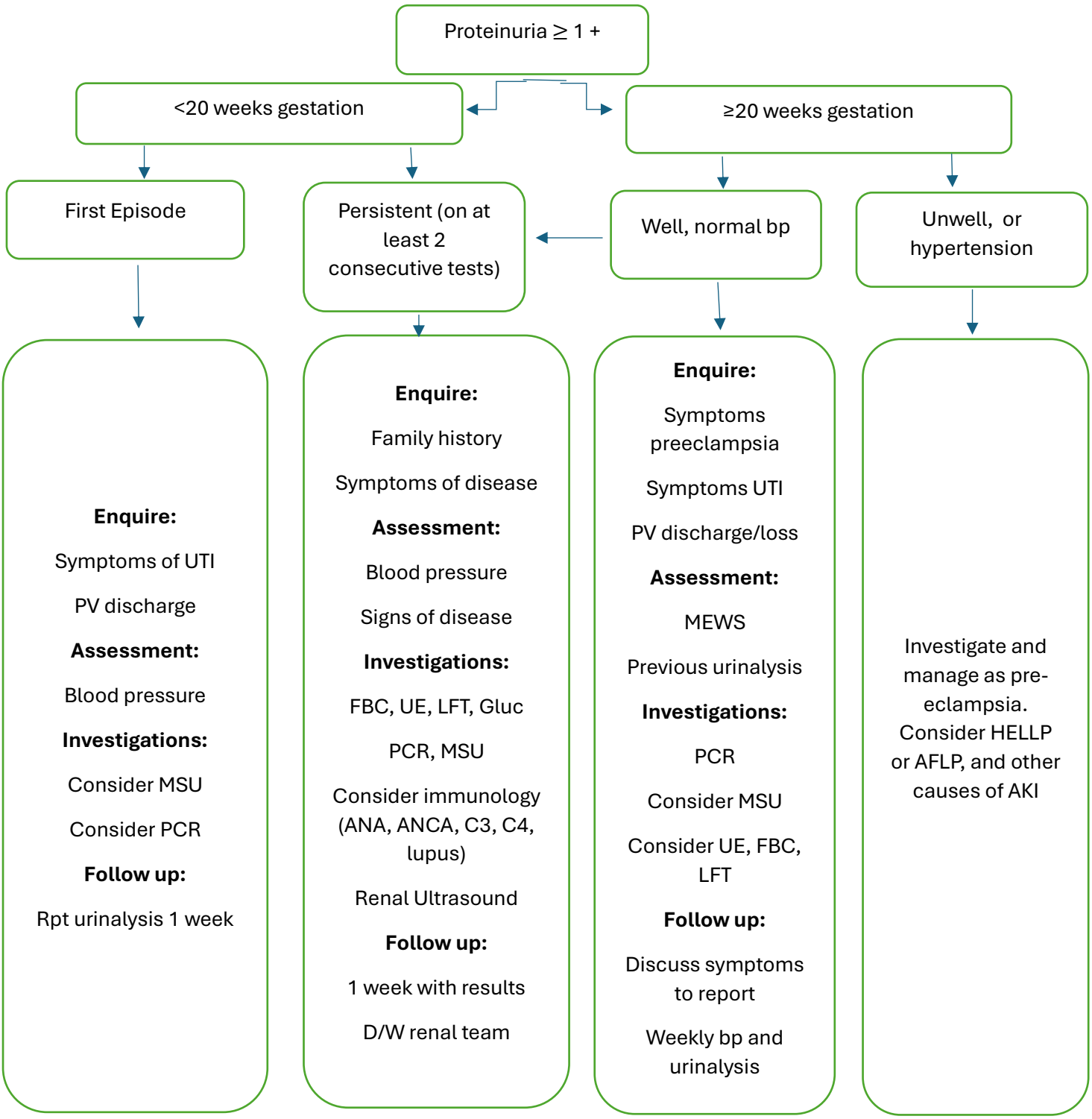
Diagnosing proteinuria
Dipstick urinalysis is useful as a screening tool for proteinuria, but is a poor quantitative test. Quantitative measurements require a urinary Protein Creatinine Ratio (PCR), and a value >30g/L is considered significant.

Urinalysis
- 1+ protein 78% have a normal PCR
- 2+ protein 21% have normal PCR
- 3+ protein 1.3% have normal PCR

Heavy proteinuria (PCR >350) is a risk factor for venous thromboembolism and low molecular weight heparin therapy is usually recommended.

Further Investigations
Initial investigations should be directed to the suspected underlying cause of proteinuria and any symptoms or signs of disease.
With persistent proteinuria correlation with renal function is essential. Other blood tests to consider include liver function tests, cholesterol, immunology screening (ANA, ANCA, C3, C4 and lupus), blood film (for evidence of haemolysis).
Urine should be sent for microscopy and culture.
A renal ultrasound should be performed for persistent unexplained proteinuria.

Other considerations:
If there is persistent proteinuria before 16/40 then 150mg aspirin daily should be recommended as renal disease is a risk factor for pre-eclampsia and small for gestational age babies.
Serial growth scans would also be recommended for women with renal disease, and thus should be recommended for women with chronic renal disease or persistent unexplained proteinuria.


Proteinuria ≥ 1 +
<20 weeks gestation
≥20 weeks gestation
First Episode
Persistent (on at least 2 consecutive tests)
Well, normal bp
Unwell, or hypertension
Enquire:
Symptoms of UTI
PV discharge
Assessment:
Blood pressure
Investigations:
Consider MSU
Consider PCR
Follow up:
Rpt urinalysis 1 week
Enquire:
Family history
Symptoms of disease
Assessment:
Blood pressure
Signs of disease
Investigations:
FBC, UE, LFT, Gluc
PCR, MSU
Consider immunology (ANA, ANCA, C3, C4, lupus)
Renal Ultrasound
Follow up:
1 week with results
D/W renal team
Enquire:
Symptoms preeclampsia
Symptoms UTI
PV discharge/loss
Assessment:
MEWS
Previous urinalysis
Investigations:
PCR
Consider MSU
Consider UE, FBC, LFT
Follow up:
Discuss symptoms to report
Weekly bp and urinalysis
Investigate and manage as pre-eclampsia. Consider HELLP or AFLP, and other causes of AKI

Condition	Symptoms and Signs	Additional Investigations
IgA Nephropathy	Haematuria, loin pain, PCR <350	Renal ultrasound, Immunology tests
Systemic Lupus Erythematous (SLE)	Malar (butterfly) rash, photosensitive rash, discoid patches, fatigue, weight loss, fever, oral ulcers, arthralgia	APTT, ESR, CRP, Immunology
Haemolytic Uraemic Sundrome (HUS)	Diarrhoea, family history	Blood film, C3 C4, clotting, LDH, Haptoglobin, ADAMTS13 level
Thrombotic Thrombocytopenic purpura (TTP)	Fever, neurological symptoms (headache, confusion, seizure) abdo pain, Diarrhoea, vomiting	Blood film, hepatoglobin, ADAMTS 13 level *HAEMATOLOGY EMERGENCY*

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Maternity Services

Checklist for Clinical Guidelines being Submitted for Approval

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