

QUIZ FEEDBACK

Serum Protein bands & routine testing during pregnancy

Introduction

This quiz feedback provides an opportunity to revisit Best Tests, July 2011 which focused on; making sense of serum protein bands and routine laboratory testing during pregnancy. All general practitioners who responded to this quiz will receive personalised online feedback and CME points.

Making sense of serum protein bands

1. Which of the following are alternative names for a monoclonal gammopathy?		Your peers	Preferred
<input type="checkbox"/>	M-band	88%	✓
<input type="checkbox"/>	Paraprotein	94%	✓
<input type="checkbox"/>	Plasma cell dysmorphism	8%	
<input type="checkbox"/>	Bence-Jones proteinuria	6%	

Comment:

The majority of respondents correctly identified the alternative terms used to describe a monoclonal gammopathy.

In addition to the term monoclonal gammopathy the following names are frequently used:

- Monoclonal protein
- Paraprotein
- M-protein/band/spike

A monoclonal gammopathy is caused by the overproduction of a population of plasma cells, which in turn produces a single immunoglobulin – known as the plasma cell dyscrasias.

The presence of monoclonal urine light chains, often referred to as Bence-Jones proteinuria, is found nearly exclusively in patients with lymphoproliferative processes such as multiple myeloma.

2. Which of the following are appropriate indications for requesting protein electrophoresis?		Your peers	Preferred
<input type="checkbox"/>	Unexplained bone pain or fracture	99%	✓
<input type="checkbox"/>	Lytic bone lesions	98%	✓
<input type="checkbox"/>	Recurrent infections	93%	✓
<input type="checkbox"/>	Incidental finding of increased serum total protein	96%	✓

Comment:

All four features are among the many indications for ordering serum protein electrophoresis, which in turn can detect a monoclonal gammopathy.

Serum protein electrophoresis separates proteins into albumin, alpha, beta and gamma globulins. An increase in gamma globulin is referred to as a gammopathy, which can either be polyclonal (displayed as a broad, diffuse band) or monoclonal (displayed as a sharp, well-defined band).

There are many reasons why serum protein electrophoresis may be requested. Clinical findings which would indicate testing include; suspected multiple myeloma, unexplained bone pain and recurrent infections. Laboratory findings that would prompt testing include; an incidental finding of increased serum total protein or unexplained anaemia, hypercalcaemia or renal impairment. Radiological findings such as lytic lesions in the bone can also indicate the need for serum protein electrophoresis.

3. When requesting laboratory tests for possible multiple myeloma, which of the following is the single most useful test?		
	Your peers	Preferred
<input type="checkbox"/> Serum total protein	2%	
<input type="checkbox"/> Serum immunoglobulins	7%	
<input type="checkbox"/> Serum protein electrophoresis	91%	✓
<input type="checkbox"/> ESR	1%	

Comment:

Serum protein electrophoresis is the best initial test if multiple myeloma is suspected. If a monoclonal gammopathy is found on serum protein electrophoresis, the laboratory will then automatically perform immunofixation to further determine the exact type of monoclonal protein.

A raised serum total protein (often found incidentally) is an indication to order a serum protein electrophoresis. ESR and serum immunoglobulins are not recommended screening tests for monoclonal bands, which are only detected by electrophoresis.

4. Which of the following conditions are associated with a monoclonal gammopathy?		
	Your peers	Preferred
<input type="checkbox"/> Amyloidosis	96%	✓
<input type="checkbox"/> Waldenström's macroglobulinaemia	99%	✓
<input type="checkbox"/> Osteoporosis	4%	
<input type="checkbox"/> Malignant melanoma	6%	

Comment:

Primary amyloidosis – associated with a monoclonal gammopathy in 85% of cases and is characterised by pathological deposits of monoclonal light-chain fragments in various tissues such as heart, liver, bone marrow, lymph nodes and bowel.

Waldenström's macroglobulinaemia – a type of small cell lymphoma associated with production (often large amounts) of monoclonal IgM.

Osteoporosis and malignant melanoma are not associated with monoclonal gammopathies

5. Which of the following statements are true about monoclonal gammopathy of undetermined significance (MGUS)?		
	Your peers	Preferred
<input type="checkbox"/> Most people with MGUS will not require ongoing monitoring	6%	
<input type="checkbox"/> MGUS has a higher incidence than multiple myeloma	95%	✓
<input type="checkbox"/> Approximately only half of patients with MGUS have evidence of lytic lesions, anaemia, hypercalcaemia or renal disease	4%	
<input type="checkbox"/> Only people with a IgD or IgE monoclonal protein require ongoing monitoring	1%	

Comment:

MGUS is the most common monoclonal gammopathy with an incidence approximately 60 times greater than multiple myeloma. Patients with MGUS have no evidence of lytic lesions, anaemia, hypercalcaemia or renal disease associated with the monoclonal gammopathy.

All patients with MGUS require periodic, ongoing monitoring (watching for clinical and laboratory features or changes) as approximately 1% of patients per year with MGUS will progress to develop multiple myeloma, amyloidosis or Waldenström's macroglobulinaemia. The risk of progression is life-long and does not plateau.

Some patients with MGUS are considered to be at higher risk of progression and should be referred to a haematologist for closer long-term monitoring. IgD or IgE monoclonal gammopathy is one factor that increases risk.

Routine laboratory testing during pregnancy

6. In which of the following presentations are first antenatal tests indicated?			
		Your peers	Preferred
<input type="checkbox"/>	When the pregnancy is confirmed	95%	✓
<input type="checkbox"/>	For all women referred for termination of pregnancy	93%	✓
<input type="checkbox"/>	For women first presenting late into the pregnancy	93%	✓
<input type="checkbox"/>	Tests should only be requested by the chosen lead maternity carer (LMC)	1%	

Comment:

When a pregnancy is confirmed, it is recommended that the woman receives a range of standard investigations. A first antenatal screen is required even if the woman is considering termination of pregnancy. Although the first antenatal screen usually occurs early in pregnancy, it may be requested at any stage of pregnancy, i.e. if a woman presents for the first time late in pregnancy, she should still receive a first antenatal screen.

The “first antenatal screen” may be requested by the General Practitioner at the first appointment when pregnancy is confirmed, and the results later forwarded to the chosen Lead Maternity Carer (LMC).

7. Which of the following tests should be performed later in the pregnancy?			
		Your peers	Preferred
<input type="checkbox"/>	Urine culture	80%	✓
<input type="checkbox"/>	Complete blood count	88%	✓
<input type="checkbox"/>	50 g glucose tolerance test	95%	✓
<input type="checkbox"/>	Rubella antibody status	1%	+/-

Comment:

At 26–28 weeks gestation, a second round of blood tests, commonly referred to as the “second antenatal” tests, is

advised for pregnant women. In most cases the LMC will arrange these tests. The second antenatal screen includes:

- 50 g glucose tolerance test (the “polydose” test)
- Complete Blood Count
- Blood group antibodies

It is recommended that all women have a mid-stream urine culture at the time of the first antenatal screen, again at the second antenatal screen and then at 36 weeks gestation, to exclude a sub-clinical urine infection (asymptomatic bacteriuria). Asymptomatic bacteriuria occurs in 2% to 10% of pregnancies and can lead to maternal pyelonephritis and may contribute to low birth-weight infants and pre-term birth (≤ 37 weeks).

Screening for rubella antibodies is recommended as part of the first antenatal screen but can be done at any stage of the pregnancy.

8. Which of the following laboratory tests are commonly affected by pregnancy?			
		Your peers	Preferred
<input type="checkbox"/>	Platelets	72%	✓
<input type="checkbox"/>	Haemoglobin	96%	✓
<input type="checkbox"/>	Alkaline phosphatase	90%	✓
<input type="checkbox"/>	Alpha-feto protein and Ca125	86%	✓

Comment:

Pregnancy can cause changes to normal reference ranges:

- Haemoglobin, FT4 and TSH commonly decrease during pregnancy.
- AFP, ALP, blood volume, Ca125, cholesterol, creatinine clearance, ESR, iron binding, white blood count and CRP commonly increase during pregnancy.
- Platelet levels can fluctuate during pregnancy. Platelets usually decrease as a result of haemodilution, and this can become more pronounced as the pregnancy progresses from the second to third trimester.