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ST VINCENT'S PATHOLOGY

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MYOSITIS AUTOANTIBODIES INFORMATION SHEET

INTRODUCTION

Myositis is characterised by chronic inflammation of muscles leading to pain and proximal weakness. It can be due to dermatomyositis or polymyositis, may be a manifestation of connective tissues diseases such as SLE or scleroderma, or may be secondary to medications, the commonest of which are statins. Polymyositis/dermatomyositis may sometimes be a paraneoplastic syndrome. Other rare causes of myositis include inclusion body myositis, eosinophilic myositis and granulomatous myositis. The cardinal feature of myositis is progressive weakness of the proximal muscles which can sometimes be associated with muscle pain and stiffness and elevated creatine kinase (CK) level. Interstitial lung disease and skin involvement may complicate the dermatomyositis/polymyositis spectrum of diseases and in some circumstances interstitial lung disease or skin involvement may be more prominent than myositis. Myocarditis can manifest in all causes of myositis.

DIAGNOSIS

Whilst an elevated CK level is a good screening test, the gold standard for the diagnosis of myositis is appropriate changes found on histological examination of a muscle biopsy. Muscle MRI and EMG can also be helpful in diagnosis. Detection of autoantibodies in serum could be useful for subcategorising the disease or predicting complications. In addition to ANA, ENA and DNA antibodies, the Immunopathology Laboratory of SydPath performs blood tests for the following myositis-specific antibodies: Jo-1, PL-7, PL-12, OJ, EJ, Mi-2a, Mi-2b, TIF1alpha, SRP, MDA5, NXP-2, SAE-1, and myositis-associated antibodies PM-Scl 100, PM-Scl 75, Ku, SSA (Ro52).

MYOSITIS SPECIFIC ANTIBODIES

TEST ORDERING AND GENERAL COMMENTS

The antibody tests are performed using serum samples tested by an immunoblot assay and should be ordered as myositis antibodies. Testing for Jo-1 and SSA (Ro-52) are also included in the ENA (extractable nuclear antigen) group of assays.

Myositis antibody tests are very sensitive. Borderline results are unlikely to be clinically significant. Positive results, especially if of low intensity, can also be non-specific and should be interpreted with caution and in the clinical context. A negative result does not exclude the diagnosis of myositis.

Jo-1 ANTIBODY: This is found in about 25% of adults with dermatomyositis/polymyositis and/or interstitial lung disease. In younger age groups, they are less frequent. Jo-1 antibodies belong to the group of aminoacyl-tRNA synthetase antibodies which are linked to the synthetase syndrome characterised by myositis, interstitial lung diseases, Raynaud's phenomenon, and mechanics hands. Patients positive for Jo-1 antibodies may have a more severe clinical course and a poorer prognosis.

PL-7, PL-12, OJ AND EJ ANTIBODY: These are present in about 1-3% of adult patients with dermatomyositis/polymyositis. They belong to the group of aminoacyl-tRNA synthetase antibodies, patients with these antibodies display features similar to those with Jo-1 antibodies and may have features of the synthetase syndrome, described above.

MI-2α AND β ANTIBODIES: These are directed at nuclear helicase DNA binding proteins 3 and 4 respectively and are found in patients with dermatomyositis and more rarely in polymyositis. Patients with both these antibodies tend to have a milder disease, have a lower incidence of associated interstitial lung disease, and respond well to treatment. In contrast to Mi-2α antibodies, Mi-2β antibodies are more strongly linked to the presence of an underlying cancer.

SRP ANTIBODY: This is directed against the cytoplasmic signal recognition particle and is found in about 5% of polymyositis patients. Patients with SRP antibodies tend to have rapidly progressive weakness, sometimes develop a necrotising myopathy, but tend not to have lung or skin involvement.

TIF1γ ANTIBODY: This is directed to transcriptional intermediary factor 1-γ and is strongly associated with dermatomyositis and an increased risk of concurrent malignancy.

MDA5 ANTIBODY: This is directed to melanoma differentiation associated gene 5 and is linked to an unusual form of dermatomyositis in which severe interstitial lung disease and skin involvement may predominate and muscle involvement may be subclinical

NXP2 ANTIBODY: This is directed to microorchidia family CW-type zinc finger protein 3 and is linked to juvenile dermatomyositis/polymyositis with concurrent calcinosis and polyarthritis. In adults it may be associated with an underlying malignancy.

SAE-1 ANTIBODY: This is directed to sumo activating enzyme subunit-1 and is strongly linked to dermatomyositis and interstitial lung disease.

MYOSITIS ASSOCIATED ANTIBODIES

PM-Scl 100 AND PM-Scl 75 ANTIBODIES: These are directed to a 100kDa or 75kDa complex of proteins in the cell nucleolus and are usually found together. They are found in about 50-70% of patients with an overlap syndrome of polymyositis/dermatomyositis and scleroderma. PM-Scl antibodies are less frequently found in patients with polymyositis/dermatomyositis or scleroderma without myositis.

Ku ANTIBODY: This is directed to a DNA non-histone binding protein and is found in up to 25% of patients with polymyositis-scleroderma overlap syndrome and much less frequently with polymyositis/dermatomyositis. Ku antibodies are also present in other connective tissue diseases such as SLE, primary Sjogren's syndrome and scleroderma.

SSA (Ro-52) ANTIBODY: This is directed to the 52kDa component of the SSA-RNA complex and is linked to dermatomyositis/polymyositis. It is frequently found together with Jo-1 and PM-Scl antibodies. In addition to myositis, SSA (Ro-52) antibodies are detectable in patients with cutaneous lupus and neonatal lupus syndrome.

SELECTED REVIEW REFERENCES

1. Alenzi, F. M. (2020) Open Access Rheumatol 12:9-14. Myositis Specific Autoantibodies: A Clinical Perspective.
2. Satoh, M. et al. (2017) Clin Rev Allergy Immunol 52:1-19.A Comprehensive Overview on Myositis-Specific Antibodies: New and Old Biomarkers in Idiopathic Inflammatory Myopathy.
3. Jee, A. S. et al. (2021) Respirology 26:23-51. Diagnosis and management of connective tissue disease-associated interstitial lung disease in Australia and New Zealand: A position statement from the Thoracic Society of Australia and New Zealand.
4. Graham, J. et al. (2020) Eur Respir J. Myositis-specific Antibodies Identify A Distinct Interstitial Pneumonia with Autoimmune Features Phenotype.