Myositis-specific and associated antibodies

(Mi-2, Ku, PM-Scl-100, PM-Scl-75, Jo-1, SRP, PL-7, PL-12, EJ, OJ and Ro-S2 IgG antibodies)

Introduction

Myositis (from the Greek myos of muscle + itis inflammation) is the name given to several diseases characterised by chronic muscle weakness and skeletal muscle inflammation. The best recognised are polymyositis (PM), dermatomyositis (DM), and inclusion body myositis. Myositis can affect many parts of the body: the joints, heart, lungs, intestines, and skin.

The myositides are rare systemic autoimmune conditions. Incidence of DM and PM is in the order of 2 to 8 new cases per million per year, while prevalence is between 5 and 11 per 100,000. A female preponderance is evident (2.5:1). DM is the most common form of myositis in all age groups. The various disorders need to be distinguished since they differ in prognosis and in response to treatment.

Myositis is characterised by the (usually) gradual onset of painless symmetrical proximal muscle weakness affecting the pelvic and shoulder girdles. In DM, skin rashes can precede or accompany the signs of muscle involvement. One type, the heliotrope rash, is a purplish erythema of the eyelids, often with periorbital edema. Other purple rashes may appear on the hands and knuckles or on the face, neck or upper chest. Along with these manifestations, diagnosis of PM and DM requires the following lab tests: serum CK levels, electromyography, and muscle biopsy. Elevated serum levels of CK (the muscle enzyme creatine kinase) are indicative of muscle damage; in active disease levels can be up to 50 times normal. Electromyography can confirm abnormalities in muscle electrical activity. Muscle biopsy is the gold standard for diagnosis. Positive biopsies show lymphocytic infiltrates surrounding and invading healthy muscle fibres.

Testing for myositis antibodies can contribute to the diagnosis of myositis and help in predicting clinical features and prognosis. Antibodies specific for myositis include:

1) several antibodies directed against cytoplasmic antigens:
   - SRP (signal recognition particle).
   - Jo-1, PL-7, PL-12, OJ, EJ, KS and Zo — the aminoacyl tRNA synthetases.
2) antibodies to nuclear antigens: Mi-2 and others.

Myositis-associated antibodies are not specific but occur also in other autoimmune diseases in the absence of myositis. These are directed to various nuclear or nucleolar antigens: PM-Scl, Ku, RNP, Ro-S2, and occasionally SS-A (Ro-60) and SS-B.

Jo-1 (anti-histidyl-tRNA synthetase) is the most common of the aminoacyl tRNA synthetase antibodies, occurring in 18-20% of PM/DM. PL-7 and PL-12 are each found in <3%, and EJ and OJ are each found in <2% of PM/DM. With few exceptions, patients have antibodies to one aminoacyl tRNA synthetase only. The ‘antisynthetase syndrome’ associated with such antibodies is characterised by polyarthritis, interstitial lung disease (ILD), Raynaud’s, skin involvement with ‘mechanics hands’, and often mild myositis. Up to 80% of anti-Jo-1 positive patients develop ILD, with dyspnoea (difficulty breathing; shortness of breath) and cough as the commonest symptoms.

Mi-2 antibodies occur in 10-15% of PM/DM (with >90% of these in DM) and are associated with acute onset of disease, good prognosis and good response to therapy. Mi-2 antibodies can be associated with ILD.

SRP antibodies occur in <5% of PM. Patients with anti-SRP syndrome show severe muscle, including myocardial, involvement along with resistance to glucocorticoids.

PM-Scl antibodies occur in 5-10% of PM/DM as well as in scleroderma and overlap syndromes.

Ku antibodies occur in 1-5% of PM/DM as well as in scleroderma and overlap syndromes, SLE, SS, and MCTD.