Intravenous immunoglobulin therapy in severe lupus myocarditis: good outcome in three patients

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Myocarditis occurs in 8–78% of necropsy studies of patients with systemic lupus erythematosus (SLE)^{1,2} but is rare in clinical practice. We describe three patients with severe lupus myocarditis, who improved dramatically after intravenous immunoglobulin (IVIg) therapy.

Table 1 gives details of the cases studied.

A 37-year-old woman (patient 3) was diagnosed with lupus, confirmed by strongly positive anti-DNA, low complement, and positive anti-RNP and anti-Sm antibodies. She developed breathlessness and a restrictive lung function pattern and received mycophenolate. She was admitted with a respiratory tract infection, neutropenia ($1.6 \times 10^9/l$) and lymphopenia. Echocardiography showed dilated right and left ventricles with preserved left ventricular ejection fraction (LVEF), with a pulmonary pressure of 50 mm Hg. Severe heart failure did not respond to diuretics, vasoactive drugs and haemofiltration. A repeat echocardiogram showed cardiomyopathy with an LVEF of 24%. Treatment for lupus myocarditis was started with IVIg

(0.4 g/kg/day for 5 days), with a dramatic improvement over 14 days. Immunosuppression was continued with low-dose intravenous cyclophosphamide³ when the sepsis had resolved. Repeat echocardiography 8 months later was normal. Two further patients are summarised in table 1.

Myocarditis is an uncommon but severe complication of SLE. Our patients presented acutely with severe ventricular systolic failure with poor LVEFs (table 1). Although myocardial biopsy was not performed, normal coronary arteries ruled out the presence of thrombotic events in two cases. The global dysfunction demonstrated by echocardiography, the normal coronary arteries and the rapid recovery of left ventricular function after treatment support the diagnosis of myocarditis secondary to SLE.

IVIg is being increasingly used for the treatment of autoimmune diseases, including SLE, in an attempt to control severe manifestations unresponsive to other treatments or to reduce the risk of infection. There are no prospective controlled

Table 1 Characteristics of the patients studied

Characteristics	Patient 1	Patient 2	Patient 3
Age (years)	34	50	37
Sex	Female	Female	Female
Years since SLE diagnosis	10	40	7
<i>Lupus manifestations</i>			
Arthritis	Yes	Yes	Yes
Raynaud's phenomenon	Yes	Yes	Yes
Photosensitivity	Yes	Yes	No
Others	Neurological involvement	Skin rashes	Mouth ulcers
APS	TIA's/miscarriages	DVT	No
<i>Clinical symptoms</i>	Chest pain, shortness of breath	Shortness of breath	Shortness of breath
CK/troponine levels()	33.99	3.75	M
Echocardiographic LVEF (%)	20	30	24
Coronary angiography	ND	Normal 6 months before	Normal arteries
<i>Immunological parameters</i>			
ANA	Weak positive	Negative	1280
dsDNA (IU/ml)	Negative	Negative	>100
C3/C4 (g/l)	0.65/0.05	0.43/0.06	0.11/.032
Anticardiolipin IgG	ND	175	7.4
Anti-RNP	Negative	Negative	Positive
Anti-Sm	Negative	Negative	Positive
Anti-Ro/La	Positive/positive	Positive/negative	Negative
Lupus anticoagulant	Positive	Positive	Positive
<i>Treatment</i>			
Methylprednisolone pulses (g/day $\times$ 3)	1	0.5	No
Ivlg i.e. (g/kg/day $\times$ 5)	0.4	0.4	0.4
Cyclophosphamide (mg/15 days $\times$ 6)	500	500	500
<i>Immediate evolution</i>	Marked improvement	Marked improvement	Marked improvement
<i>Follow-up (months)</i>	8	7	6

ANA, antinuclear antibodies; APS, antiphospholipid syndrome; CK, creatine kinase; DVT, deep vein thrombosis; LVEF, left ventricular ejection fraction; SLE, systemic lupus erythematosus; TIA, transient ischaemic attack.

trials of IVIg in SLE, but many published cases series have shown improvement of cutaneous, muscular, joint, neuropsychiatric, serositis, haematological, vasculitic and nephritic manifestations of SLE.⁴ There are few reports of lupus myocarditis treated with IVIg, but all have shown rapid improvement in the clinical and echocardiographic abnormalities.^{5,6}

Our three patients rapidly improved shortly after IVIg treatment, all being discharged from the coronary care unit within 2 weeks, and steroid treatment was rapidly reduced. No side effects were noted. All three had had a major infection before developing acute myocarditis precluding immunosuppression.

There is no consensus on the specific treatment of SLE myocarditis. Most reports describe treatment with high-dose corticosteroids, followed by either cyclophosphamide or azathioprine, in addition to conventional treatment for heart failure. Our three patients had received high-dose corticosteroids without improvement. IVIg has also been used for myocarditis secondary to Kawasaki's disease.⁷

Our report emphasises both the complicated differential diagnosis of cardiac involvement in SLE, and the probable beneficial role of IVIg treatment in this disease, especially in severely ill patients with concomitant sepsis.

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