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How to investigate multisystem disease

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A B S T R A C T

The investigation of the patient with possible systemic autoimmune rheumatic disease is potentially one of the most challenging areas of rheumatology as the differential diagnosis is potentially very broad. The investigative approach should not only be directed at confirming the diagnosis of an autoimmune rheumatic disease but also at excluding as best as possible the major alternative diagnoses of malignancy and infection. A systematic approach should yield a positive diagnosis in the majority of cases based on excluding infection by appropriate cultures and serology, malignancy using imaging including 18-fluorodeoxyglucose positron emission tomography/computerized tomography (FDG PET/CT). The most important part of the assessment is the history, in particular covering systems that may not previously been assessed such as ears, nose, throat or eyes. The clue to the diagnosis of an autoimmune rheumatic disease often lies in detecting the multisystem nature of the condition and the cumulative effects of multiorgan involvement. Investigation may therefore need to cover different systems. Although stratified approaches have been described, they have not been subjected to a detailed investigation as to their effectiveness.

Introduction

The investigation of possible multisystem autoimmune rheumatic disease (MARD) is a common clinical situation, and it is one of the more challenging aspects of rheumatology practice, requiring

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broad knowledge of many diverse specialities. The rheumatologist is often the last port of call in the investigation of a patient with symptoms affecting several different organ systems, which have not been previously linked. The investigative strategy must be aimed at not only confirming the diagnosis but also excluding significant mimics of multisystem rheumatic disease particularly infection and malignancy. MARDs comprise the connective tissue diseases such as systemic lupus erythematosus (SLE), antiphospholipid syndrome, Sjögren's syndrome, dermatomyositis, scleroderma and the vasculitides including the antineutrophil cytoplasmic antibody (ANCA)-associated vasculitides (AAV) (granulomatosis with polyangiitis (Wegener's) (GPA)), microscopic polyangiitis (MPA) and eosinophilic granulomatosis with polyangiitis (Churg–Strauss) (EGPA) (Table 1). The aim of this chapter is to discuss the investigation of MARD and its differentiation from other system illnesses in adults. In children, the differential diagnosis is different, and it also includes systemic monogenic autoinflammatory conditions such as familial Mediterranean fever, which are outside the scope of this chapter.

History and examination

The key to the diagnosis of any rheumatic condition is the history. When trying to make a diagnosis in the context of possible systemic autoimmune rheumatic disease, it is crucial to obtain a detailed

Table 1
Possible differential diagnoses for multisystem autoimmune rheumatic disease.

Systemic connective tissue diseases	Rheumatoid arthritis
	Systemic lupus erythematosus
	Sjögren's syndrome
	Systemic sclerosis
	Inflammatory myositis
	Antiphospholipid syndrome
	Eosinophilic fasciitis
Systemic vasculitides	Giant cell arteritis
	Takayasu arteritis
	ANCA-associated vasculitis
	Behçet's syndrome
	CNS angiitis
	IgA vasculitis
	Cryoglobulinaemia
Infection	
Viral	Hepatitis (especially B and C)
	HIV
	HTLV 1
	Parvovirus B19
	Cytomegalovirus
	Epstein–Barr virus
	Alpha viruses
Bacterial	*Mycobacterium tuberculosis*
	Neisseria meningitidis
	Streptococcus pneumoniae
	Mycoplasma pneumoniae
Fungal	Aspergillosis
	Histoplasmosis
	Cryptococcosis
	Pneumocystis jirovecii
Parasitic	*Plasmodium* spp.
	Giardiasis
	Toxoplasmosis
	Schistosomiasis
Malignancy	Lymphoma
	Solid malignancy
	Myelodysplasia
Drugs	
Environmental toxins	