trial in patients with severe pain and limitations in daily activities, but controlled trials will certainly help to establish the effectiveness and cost effectiveness of physiotherapy and injections in patients with mild to moderate shoulder pain. Future trials may also evaluate the effectiveness of combined treatment (injections plus physiotherapy).

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## Exercise in juvenile idiopathic arthritis: promise or passé

We were interested in the recently published article in the *Annals* by Takken *et al*.[1] Notwithstanding their substantial work, we have a few comments pertaining to the exercise regimens in children with juvenile idiopathic arthritis (JIA).

Firstly, we did not see any information about whether the patients had ever been following an exercise protocol before they were included in the study and also whether they were prescribed a protocol afterwards. Information about these two points is important for an interpretation of the patients' results and for providing evidence about the practical implications of the study.

Secondly, when mentioning the diminished loadbearing capacity of these subjects owing to their inflammatory disease and the immune suppressive drugs, they drew attention to a study in which weightbearing exercises were shown to improve the aerobic endurance of such patients.[2] At this point, it is noteworthy to add that the myopathic effects of corticosteroids should also be remembered when exercise is prescribed. It is known that eccentric muscle contractions in normal subjects are responsible for a much greater efflux of muscle enzymes into the circulation than is caused by concentric contractions, and are associated with ultrastructural indications of damage to the muscle.[3 4] Thus in patients with JIA—where steroid use is prevalent—concentric types of exercise should preferably be prescribed. These may include simply walking, cycling, or running. However, the list of sports which can be played is endless and there is an excess of activities these—otherwise sedentary—children can be encouraged to take part in to obtain exercise.[5] In this way not only will there be an increase in their aerobic capacities but also they will encounter fewer disabilities related to muscle anaerobiosis—much more common in children who use much more energy than adults during daily activities.

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## Authors' reply

We would sincerely like to thank Özçakar and Özçakar for their response.

Firstly, the patients studied did not actively participate in endurance sports activities at the time of measurement. However, some of the patients had taken part in some sports activities in the period before the disease onset, but not in the six months before our study was performed. It is known from the literature that there is a rapid diminution in fitness once training stops.[1]

We did not prescribe exercises based on the current findings. The Caltrac is a portable electronic activity monitor that measures movements in the vertical plane. It sums and integrates the absolute value of the acceleration versus time curve and derives a numerical count that is displayed on the monitor. There are no normal values for this instrument. The described data were baseline data from a randomised controlled trial for the effectiveness of aquatic exercise therapy.[2] Secondly, we did not discuss the effects of corticosteroid treatment on aerobic fitness, because only a small minority of our patients (four) had systemic juvenile idiopathic arthritis (JIA), in which steroids are the preferred treatment. In other JIA subgroups, non-steroidal anti-inflammatory drugs and methotrexate are the common treatment in our country nowadays. A discussion on the effects of drugs and inflammation on exercise capacity can be found elsewhere.[3 4]

We could not comment on the paper cited by the authors because it had not yet been published when we wrote this letter. Furthermore, we would like to add that JIA and juvenile dermatomyositis (JDM) are distinct diseases and that the exercise capacities of these patients do differ significantly, with patients with JDM being more affected than patients with JIA.[5] Therefore, the exercise prescription for patients with JIA and JDM should be different, and adapted to the individual patients needs and capacity.

Moreover, we are not aware of studies showing an anaerobiosis in muscles of patients with JIA during activities of daily living.

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## Progressive multifocal leucoencephalopathy and immunosuppression

We report an immunocompromised patient with progressive multifocal leucoencephalopathy (PML), who demonstrates the usefulness and limitation of the algorithm of Warnatz *et al*[1] for investigation of patients with pre-existing autoimmune diseases and new onset neuropsychiatric abnormalities. A prerequisite for the use of this algorithm requires a high degree of awareness for infection to prevent misclassification of the underlying problem.

This 61 year old white woman had had dermatomyositis since 1996 as manifest by Gottron's papules, heliotrope rash, proximal muscle weakness, and antinuclear antibody (ANA) titre 1/1280 speckled pattern. Previous management included azathioprine, methotrexate, hydroxychloroquine, and intravenous immunoglobulin; the disease was controlled for the previous 20 months while receiving cyclophosphamide 100 mg and prednisone 5 mg daily.

One week before admission the patient developed dizziness, weakness, and left sided hearing loss. Meclizine was prescribed for possible Ménière's disease. Facial weakness and dysarthria developed. A physical examination showed left sided hearing loss, left facial droop, left hemiparesis with concomitant graphaesthesia, and impaired stereognosis; left patella hyperreflexia was also present. Magnetic resonance imaging (MRI) of the brain was performed at an outlying facility and was felt to demonstrate a subacute infarct. There was increased signal intensity in the right posterior temporal lobe measuring 4 cm in diameter without mass effect or haemorrhage, and an additional temporoparietal lesion. Punctate areas of increased signal were seen in the mid-portion of the pons (fig 1A). She was admitted for further evaluation of stroke. Laboratory data included normal complete blood counts,

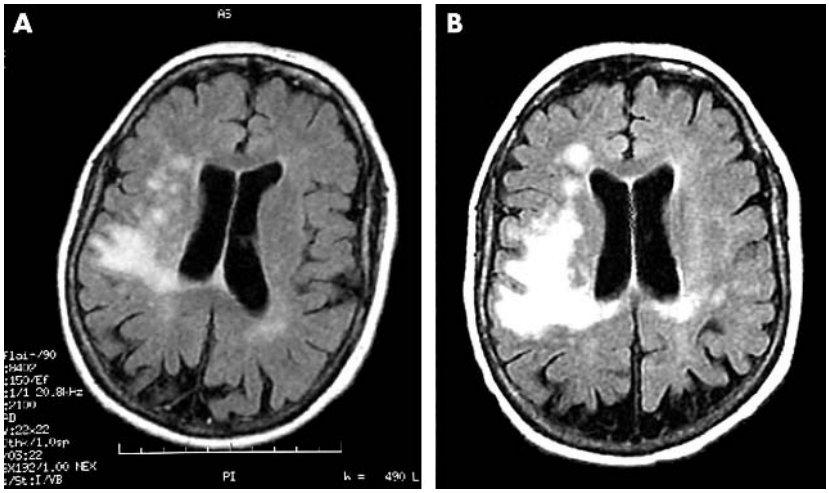


**Figure 1** Magnetic resonance imaging of the brain. (A) 7 days and (B) 19 days after the initial symptoms in an immunocompromised patient with dermatomyositis and progressive multifocal leucoencephalopathy.

metabolic profile, and coagulation assays, including anticardiolipin antibodies and lupus anticoagulant. An echocardiogram and carotid Doppler ultrasound were normal.

Intensive physical and occupational therapy were prescribed. Over the next 12 days, the left sided weakness progressed. The patient also developed decreased sensation, hyperreflexia, and extensor plantar response on the left. Further evaluation was started. Cerebrospinal fluid showed 1 white blood cell/high powered field (hpf), 0 red blood cells/hpf, protein 0.43 g/l, glucose 2.9 mmol/l. A repeat MRI of the brain showed progressive changes of white matter affecting the right cerebral hemisphere, again with sparing of the cortex. Extensive involvement of the pons was present as well as minimal involvement of the right middle cerebellar peduncle. Additional cerebrospinal fluid studies included negative viral and bacterial cultures, negative paraneoplastic autoantibodies, and negative cytology. Polymerase chain reaction for JC virus was positive.

Several features of our patient's presentation are rare in PML and caused early diagnostic confusion with delay in the diagnosis. These included the acute nature of the neurological event as well as cranial nerve involvement. Ménière's disease was initially suspected owing to the sudden onset of dizziness and left sided hearing loss, and probably reflects CN VIII involvement, as MRI did not have findings to suggest a central lesion at the cerebellopontine angle. Stroke, being considerably more common than PML in immunocompromised patients, was a further consideration in this patient owing to the acute onset of symptoms and was suggested on the initial request for imaging studies. This influenced the interpretation of the MRI changes towards infarction despite predominance of white matter involvement. The more ominous diagnosis of PML was suspected after neurological symptoms worsened (12 days after hospital presentation and 19 days after the initial event). Interpretation of the second MRI was that stroke was unlikely owing to the rapid progression, distribution, and cortical sparing, and PML was likely in this immunocompromised patient (fig 1B).

PML is well reported in HIV/AIDS publications, but there are fewer than 30 cases described in rheumatology patients, resulting in a low degree of awareness. This case emphasises the importance of informing radiologists about the immune status of patients being studied so that appropriate consideration for infection may be entertained. Otherwise, this algorithm may not be used, resulting in missed or delayed diagnosis.

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## Authors' reply

Dr Cuevas and colleagues express the concern that a high degree of awareness for infection is needed to prevent misclassification of early progressive multifocal leucoencephalopathy (PML). As we point out in our article, the sole risk factor for cerebral opportunistic infections is immunosuppression. The clinical distinction between PML and central nervous system involvement of systemic rheumatic diseases is always vague. Thus, in all immunosuppressed patients with a new onset or change of cerebral symptoms a careful diagnostic approach is recommended.

There is general agreement that close communication between rheumatologists and radiologists clearly helps to interpret brain images correctly.

We agree that subacute cerebrovascular disease may also be a differential diagnosis in early PML as may other diseases such as ADEM, multiple sclerosis, sarcoidosis, or multifocal glioma. The topographic pattern in PML (sparing of cortex) largely excludes large-vessel stroke, but it may be confused with subacute lacunar infarcts. Further, the neurological deficits, including cranial nerve involvement together with middle sized lesions at three typical locations, do not support the assumption of stroke. Acute onset of symptoms may occur in PML.[1] The early PML lesions are typically asymmetric and multifocally distributed in the white matter. On the other hand, acute and subacute ischaemic lesions can easily be differentiated from PML and similar lesions by diffusion weighted sequences. In later stages PML lesions are confluent and expand concentrically, strongly suggesting the diagnosis.

Cerebral vasculitis, which has been seen rarely in patients with dermatomyositis,[2 3] could be differentiated from PML by the enhancement of the lesions after administration of gadolinium, and may be excluded by the lack of disease activity.

The differential diagnosis in immunosuppressed patients with systemic rheumatic diseases and cerebral symptoms is wide. The diagnosis may be time consuming and costly. Algorithms may be helpful in this setting.

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