Reduced oxidative phosphorylation and proton efflux suggest reduced capillary blood supply in skeletal muscle of patients with dermatomyositis and polymyositis: A quantitative 31P-magnetic resonance spectroscopy and MRI study

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Quantitative MRI and phosphorus magnetic resonance spectroscopy (31P-MRS) were used to investigate skeletal muscle metabolism in vivo in patients with dermatomyositis (DM) and polymyositis (PM) in order to evaluate the role of mitochondrial abnormalities in the pathogenesis and clinical expression of these conditions. Nine patients with DM (mean age ± SD, 57 ± 14 years) and five with PM (42 ± 12 years) and with age at disease onset 53 ± 16 and 38 ± 12 years, respectively, were included in the study together with 18 agematched controls. Post-exercise 31P-MRS indices of muscle oxidative metabolism were all impaired in DM and PM. In both groups of patients, the phosphocreatine and adenosine diphosphate recovery half-times were almost twice as long as in controls ($P < 0.05$ for each variable) and the maximum rate of mitochondrial ATP production was half that found in normal subjects ($P < 0.001$). The rate of proton efflux from muscle fibres was significantly reduced in DM ($P < 0.001$) and PM