Steroid therapy is associated with decreased numbers of dendritic cells and fibroblasts, and increased numbers of satellite cells, in the dystrophic skeletal muscle


Abstract:

Abstract Background The possible therapeutic benefits of using steroids to enhance muscle strength and slow disease progression in Duchenne muscular dystrophy (DMD) and Becker muscular dystrophy (BMD) has been examined previously. In this investigation, it was hypothesised that steroid therapy is associated with morphological changes in the dystrophic muscle. Objectives and methods To test this hypothesis, two muscle biopsies were obtained (one biopsy before treatment, and the second 6 months following prednisone therapy) from 24 patients with dystrophies (18 DMD, 6 BMD). The participants were categorised into: control (6 specimens, normal muscle), untreated and treated groups. The muscle was evaluated for ultrastructural changes using transmission electron microscopy (TEM). Results In the untreated group, the muscle fibres were degenerated and of variable sizes. The myofibrils were thin with either complete loss of bands and/or abnormal banding patterns. The Z-lines were irregularly spaced and loosely registered. The mitochondria of the myofibrils were small, few, spherical and irregularly distributed. Numerous dendritic cells (DCs) with euchromatic nuclei, and multiple and long dendrites, were seen among the myofibrils. The collagen fibres among the muscle fibres (endomysium) were numerous and large. The satellite cells had euchromatic nuclei with clumps of heterochromatin. In the treated group, the muscle fibres were relatively uniform in size with occasional fibres showing partial degeneration. The myofibrils were small in size and regularly arranged between the myofibrils. Few DCs, with heterochromatic nuclei, and few and short dendrites appeared between the myofibrils. The collagen fibres between the muscle fibres (endomysium) were numerous and large. As compared with the treated group, there was a statistically significant increase (p

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