MATTERS ARISING

Effect of intensive exercise on patients with active RA

The effect of intensive exercise on disease activity in rheumatoid arthritis (RA) is an interesting one.¹ Although we would not dispute that such exercise does indeed have a beneficial effect on parameters of disease activity, we wish to propose an alternative hypothesis as to its mechanism. In particular, we would argue that the effect of raised intra-articular pressure on synovial blood flow during exercise is not as the authors suggest.

The intra-articular pressure in chronically inflamed joints undoubtedly rises during exercise, and exceeds capillary perfusion pressure within the synovium.^{2–3} This pressure rise occurs in joints with and without effusions. It is clearly difficult to measure intra-articular pressure during dynamic exercise, but we would speculate that the pressure rises which occur during dynamic exercise are similar to those occurring during static exercise. The study that is quoted by the authors suggests that synovial blood flow increases during dynamic exercise such as walking and cycling and was only measured in joints with effusions.⁴ We would argue that raised intra-articular pressure during any form of exercise not only *compromises* synovial blood flow, resulting in synovial hypoxia, but is the initiating step in reperfusion injury.⁵ Hypoxia-reperfusion injury is one of the mechanisms by which reactive oxygen species (ROS) are produced, including the highly toxic hydroxyl radical.⁶ Damage by such ROS to biomolecules and tissues within the rheumatoid joint is well documented.^{7,8} Oxidative damage to fine nociceptor nerve endings within the synovium renders the joint relatively anaesthetic⁹ and perhaps allows the patient to exercise the joint more vigorously. We propose therefore that intensive exercise brings about an “auto-synovectomy”, effectively reducing the amount of inflammation within the joint and thereby reducing the disease activity score.

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4 James MJ, Cleland LG, Gaffney RD, Proudman SM, Catterton BE. Effect of exercise on ^{99m}Tc-DPTA clearance from knees with effusions. J Rheumatol 1994;21:501–4.
5 Edmonds SE, Blake DR, Morris CJ, Winyard PG. An imaginative approach to synovitis – the role of hypoxic reperfusion damage in arthritis. J Rheumatol 1993;20(suppl 37):26–31.
6 Kaur H, Edmonds SE, Blake DR, Halliwell B. Hydroxyl radical generation by rheumatoid blood and knee joint synovial fluid. Ann Rheum Dis 1996;55:915–20.
7 Blake DR, Merry P, Unsworth J, Kidd BL, Outhwaite J, Ballard R, *et al.* Hypoxic-reperfusion injury in the inflamed human joint. Lancet 1989;i:289–93.
8 Merry P, Grootveld M, Lunec J, Blake DR. Oxidative damage to lipids within the inflamed human joint provides evidence of radical mediated hypoxic-reperfusion injury. Am J Clin Nutr 1991;53:S362–9.
9 Mapp PI, Walsh DA, Garrett NE, Kidd BL, Cruwys SC, Polak JM, *et al.* Effect of three animal models of inflammation on nerve fibres in the synovium. Ann Rheum Dis 1994;53:240–6.

Authors’ reply

In our study we observed a statistically non-significant decrease in all measured parameters of disease activity in patients with active rheumatoid arthritis who participated in an intensive exercise programme. In all exercise forms only the larger joints, in particular, the knee joints, were involved. None of the exercises focused on the hand joints. We assessed the 28 swollen joint count as proposed by Fuchs and Pincus.¹ If intensive exercise brings about an “auto-synovectomy” as suggested by Edmonds and colleagues one would expect a decrease in the number of swollen knees and a stable number of swollen joints in the hand. To test this hypothesis we compared in our data the number of swollen knee and hand joints (proximal interphalangeal joints and metacarpophalangeal joints) at baseline and at 24 weeks of follow up in patients who completed the study.

Table 1 shows that within the group undergoing intensive exercise both the number of swollen knees and the number of swollen hand joints decreased significantly. Differences between groups were not statistically significant. In our opinion hypoxia-reperfusion injury may induce “auto-synovectomy”, but this hypothesis does not fully explain the decrease in inflammation after vigorous exercise in other than exercised joints.

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1 Fuchs HA, Pincus T. Reduced joint counts in controlled clinical trials in rheumatoid arthritis. Arthritis Rheum 1994;37:470–5.

Table 1 Changes in numbers of swollen knee and hand joints in patients randomly assigned to an intensive or conservative exercise programme during a stay in hospital

	Intensive exercise (n=28)	Conservative exercise (n=20)	Mean difference
Knee joints (max = 2)			
Baseline, mean (SD)	1.3 (0.8)	1.4 (0.8)	
Change at 24 weeks (95% CI)	–0.7 (–1.1 to –0.3)	–0.5 (–0.9 to 0.0)	0.3 (–0.3 to 0.9)
Hand joints (max = 20)			
Baseline, mean (SD)	12.1 (4.5)	11.9 (3.9)	
Change at 24 weeks (95% CI)	–4.0 (–6.2 to –1.8)	–2.3 (–5.0 to 0.4)	1.7 (–5.1 to 1.6)

Pulmonary function in patients with primary Sjögren’s syndrome

I read with interest the recent paper entitled “Ten year follow up of pulmonary function in patients with primary Sjögren’s syndrome” by Davidson *et al.*¹

This is an excellent 10 year follow up review of patients with primary Sjögren’s syndrome and the development of pulmonary manifestations. Pulmonary disease was found to occur predominantly in anti-Ro antibody positive patients and presents early in the course of the disease.

These findings confirm the relatively benign pulmonary disease in patients with primary Sjögren’s syndrome and the good long term prognosis.² This information is consistent with previous reports. In addition, the incidence of intestinal lung disease of about 25% is comparable with the incidence found in previous studies.^{3–5}

These findings are important and amplify the information previously published about pulmonary disease in Sjögren’s syndrome.

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1 Davidson BKS, Kelly CA, Griffiths ID. Ten year follow up of pulmonary function in patients with primary Sjögren’s syndrome. Ann Rheum Dis 2000;59:709–12.
2 Strimlan CV, Rosenow EC, Divertie MB, Harrison EG Jr. Pulmonary manifestation of Sjögren’s syndrome. Chest 1976;70:354–61.
3 Strimlan CV. Pulmonary involvement in Sjögren’s syndrome. Respiration 1985;290:29.
4 Strimlan CV. Pulmonary involvement in Sjögren’s syndrome. Chest 1986;89:901.
5 Strimlan CV. Interstitial lung disease and primary Sjögren’s syndrome: clinical-pathological evaluation and response to treatment. Am J Respir Crit Care Med 1997;155:1489.

LETTERS TO THE EDITOR

RS3PE and ovarian cancer

A variety of rheumatological diseases are associated with malignancies; among these polymyositis-dermatomyositis, carcinomatous polyarthritis, and palmar fasciitis are the most common.^{1,2} Other associated diseases include reflex algoneurodystrophy—that is, shoulder-hand syndrome or Sudeck’s atrophy. In 1985 a syndrome characterised by tenosynovitis of the sheaths of the tendons of hands, symmetrical distal synovitis, pitting oedema over the hand dorsum and the feet

1 van den Ende CHM, Breedveld FC, le Cessie S, Dijkmans BAC, de Mug AW, Hazes JMW. Effect of intensive exercise on patients with active rheumatoid arthritis: a randomised clinical trial. Ann Rheum Dis 2000;59:615–21.
2 Merry P, Williams R, Cox N, King JB, Blake DR. Comparative study of intra-articular pressure dynamics in joints with acute traumatic and chronic inflammatory effusions: potential implications for hypoxia-reperfusion injury. Ann Rheum Dis 1991;50:917–20.
3 Gaffney K, Williams RB, Jolliffe VA, Blake DR. Intra-articular pressure changes in rheumatoid and normal peripheral joints. Ann Rheum Dis 1995;54:670–3.