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Prophylactic hydrotherapy

The role of hydrotherapy in the treatment of rheumatic diseases continues to arouse controversy. Understandably, enthusiasm is greatest and advocates are most vocal in countries where there are substantial facilities for balneotherapy and where the cost is traditionally reimbursed by health insurance schemes. There is also a strong cultural tradition of this, with whole journals devoted to the craft in Eastern and Germanic-speaking Europe. Western Europe, where the recovery of the cost from medical insurance is not normally possible, has adopted a more neutral position, tempered with scientific scepticism. In North America, apart from one or two notable centres famous for hydrotherapy, relaxing exercises in warm water have been the object of commercial exploitation, often with the use of 'personal trainers', a cult now spreading across Europe.

In the face of this divergent opinion, sometimes embellished with hype, is there a place for prophylactic hydrotherapy in the management of rheumatic diseases in those countries that only spend a modest proportion

of their gross national product on health-care? Should this be funded by the government or through private means? Might the less expensive option of providing, at dedicated times in a public swimming pool, an exercise group supervised by a physiotherapist be more cost-effective, perhaps even more efficacious? Such matters have recently been the subject of critical appraisal in the provincial town of Exeter, where, since April 1994, a weekly group exercise session in a public swimming pool has been established under the auspices of the local Disability Development Officer to serve the needs of the local population with mobility problems at minimal expense. This was in an area where the only hydrotherapy previously offered was at a local hospital as a short course of treatment of approximately 4 weeks, usually not more frequently than twice each year. The initiative has recently been the subject of a prize-winning paper that received the annual silver medal donated by the Arthritis Research Council, the UK's principal charity for arthritis research, as an annual award for

physiotherapists. This work also forms the basis of an MSc research degree [1].

The local heated swimming pool offered subsidized rates to patients, with the full-time services of a life-guard. Helpers and carers were admitted free of charge and the Physiotherapy Service agreed to pay the cost of a physiotherapist, who was made available from the Exeter Community Health Trust, for one session each week. Local physiotherapists were advised of the service and invited to recommend patients; in practice the majority of patients complained of musculoskeletal problems rather than disability as a result of stroke. Self-referral and general practitioner referral were also accepted. Since initiation of the scheme in April 1994, the group has continued to expand; many patients have withdrawn from their booked treatment in the hydrotherapy pool at the hospital, which was thus able to provide more capacity for hospital patients. There are several features which distinguish this scheme from the more usual physiotherapy regimes used to treat musculoskeletal pain. First, the community setting in a fitness centre reduces the emphasis on treatment of illness and concentrates more on improving health and well-being. Secondly, the general exercises given are not aimed at specific painful joints but are rather used as a pain management strategy concentrating on whole body improvement. A third factor is that the physiotherapist has a supervisory role only. In addition, social interaction is actively encouraged.

That such an endeavour should produce therapeutic benefit has some support in the literature, although the precise mechanism by which benefit is achieved is debatable. Bed rest leads to loss of muscle strength [2] and a secondary reduction in cardiovascular fitness, although it may relieve pain. Current pain management strategy is to minimize bed rest because the loss of muscle strength, the focus on the source of pain and the absence of other stimuli may indeed exacerbate rather than relieve pain if maintained for more than 1 or 2 days. However, exercise offers positive psychological benefit [3], with improved self-esteem and reduced depression. The benefit of aerobic exercise is greater in those with initial depressive symptoms [4] and 'exhilaration and mental vigour' have been recorded after moderate and strong exercise [5].

In osteoarthritis, studies have supported the benefit of out-patient physiotherapy without the use of water [6, 7]. The Fitness Arthritis and Seniors Trial (FAST) has shown that over an 18-month period older people with symptomatic osteoarthritis of the knee who participated in an aerobic or resistance exercise programme had consistent improvement in self-reported pain and better scores on functional rating than those participating simply in a health education programme [8].

In rheumatoid arthritis, bed rest of up to 18 h a day with minimal ambulation produced no improvement compared with an activity programme that encouraged ambulation [9]. Subsequent studies have shown that the beneficial effects of exercise are not accompanied by

exacerbation of joint disease [10–12]. A comparison of exercising with full weight-bearing against exercising in water (partial weight-bearing) and non-aerobic movement exercises as a control has shown benefit from hydrotherapy [12], and aqua-aerobic therapy has been effective compared with drug treatment, with its attendant side-effects [13].

Against this background, the precise mechanism by which hydrotherapy relieves pain and improves function is more contentious. Clearly, buoyancy supports the weight of the body, so that supervised physiotherapy has greater potential. Physiological changes occurring during immersion are also profound [14]. The hydrostatic pressure gradient produced when remaining upright immersed in water is thought, through a redistribution of blood, to account for the profound diuresis and natriuresis that occurs. Plasma viscosity in rheumatoid arthritis falls during immersion, probably because of this redistribution [15], haemodilution occurs, although hormonal effects mediated by endogenous cortisol, perhaps through the stress of immersion, could also not be excluded. That the changes might also be related to water temperature has also been considered; cardiovascular change occurs with temperatures hotter than 98°F, but compliance is at its worst if the temperature of the water drops below 84°F [13].

However, the concept of group therapy must also be considered. The power of supportive responses provided by patients similarly afflicted is now well recognized [16] and has formed the basis of group exercise sessions, as recommended by the National Ankylosing Spondylitis Society for this disease for many years. Social interaction, role modelling, reinforcement and feedback all inevitably occur [17]. The advantages are felt to more than balance the disadvantages of lack of confidentiality and, perhaps, the relative lack of individual attention compared with more conventional individual hydrotherapy in a hospital pool. However, rather than being a disadvantage compared with more conventional individual hydrotherapy in a hospital, the relative lack of individual attention may be an advantage for long-term sufferers from chronic arthritic pain. The increase in fitness and mobility, because of the general whole body approach and the lack of focus on individual painful joints, may bring about greater relief of the effects of chronic arthritis pain. By definition, a local swimming pool may be closer than a regional hospital-based hydrotherapy pool, particularly in rural areas, where the camaraderie may also be greater. Perhaps the self-payment of entrance fees, further reducing cost, might even improve self-esteem.

A little more validation is now required. Serial follow-up of participants at the Exeter club, once they have been grouped by diagnosis, would be helpful. For patients with rheumatoid arthritis, a simple visual analogue scale for pain and an articular index for joint inflammation would help to determine whether the benefits are purely psychological or result from a more physiologically mediated improvement in inflammation.

Ultimately, studies on diurnal variation associated with hydrotherapy might clarify this further. In turn, controlled studies would be needed against analgesics, psychotropic agents or anti-inflammatory agents, according to the postulated mechanism of action of the hydrotherapy. The cost of the supervised but communal 'self-help' public pool needs to be compared accurately against the cost of the more individual but expensive attention in a hospital hydrotherapy pool, with due attention to improvement of function in both groups. Patient preference and expectation should also not be forgotten. These may also differ according to the age of the participants.

These reservations apart, the Exeter experiment in communal hydrotherapy is to be applauded, and the supervisors should be encouraged to evaluate the benefit that is claimed even more rigorously if the true role of such endeavours in a national health service is to be defined.

K. A. REILLY and H. A. BIRD¹

Reading Clinic, Reading and¹Clinical Pharmacology Unit (Rheumatism Research), Chapel Allerton Hospital, Leeds, UK

Correspondence to: K. A. Reilly, Reading Clinic, 10 Eldon Road, Reading RG1 4DH, UK.

References

1. Reilly K. Is the use of group exercises in a public swimming pool an effective and economic tool in the management of patients with chronic musculo-skeletal pain? MSc thesis, College of Medicine, University of Wales, 1999.
2. Chase JA. Outpatient management of low back pain. *Orthop Nursing* 1992;11:11–20.
3. Nordemar R. Physical training in rheumatoid arthritis: A controlled long term study. II. Functional capacity and general attitudes. *Scand J Rheumatol* 1981;10:25–30.
4. McDonald DG, Hodgdon JA. Psychological effects of aerobic fitness training: Research and theory. New York: Springer Verlag, 1991.
5. Steptoe A *et al.* Acute mood responses to maximal and submaximal exercise in active and inactive men. *Psychol Health* 1993;88–99.
6. Marks R, Cantin D. Symptomatic osteo-arthritis of the knee: The efficacy of physiotherapy. *Physiotherapy* 1997; 83:306–12.
7. Hurley MV, Scott DL. Improvements in quadriceps sensorimotor function and disability of patients with knee osteoarthritis following a clinically practicable exercise regime. *Br J Rheumatol* 1997;37:1181–7.
8. Ettinger WH, Burns R, Messier SP, Applegate W, Rejeski WJ, Morgan T. A randomized trial comparing aerobic exercise and resistance exercise to a health education programme on physical disability in older adults with knee osteoarthritis: The Fitness Arthritis and Seniors Trial (FAST). *J Am Med Assoc* 1997;277:25–31.
9. Mills JA, Pinals RS, Ropes MW *et al.* Value of bed rest in patients with rheumatoid arthritis. *New Engl J Med* 1971;284:453–8.
10. Ekblom B, Lovgren A, Olderin M, Friedstrom M, Satterstrom G. Effect of short-term physical training on patients with rheumatoid arthritis: A six month follow-up study. *Scand J Rheumatol* 1975;4:87–91.
11. Harkom TM, Lampman RM, Banwell BF, Castor CW. Therapeutic value of graded aerobic exercise training in rheumatoid arthritis. *Arthritis Rheum* 1985; 28:32–9.
12. Minor M, Hewett JE, Webel RR, Anderson SK, Kay DR. Efficacy of physical conditioning exercise in patients with rheumatoid arthritis and osteoarthritis. *Arthritis Rheum* 1989;32:1396–405.
13. Bunning RD, Materson RS. A rational program of exercise for patients with osteoarthritis. *Semin Arthritis Rheum* 1991;21[3 Suppl. 2]:33–43.
14. O'Hare SP. Water immersion in rheumatoid arthritis. *Br J Rheumatol* 1984;23:117–8.
15. Hall J. A randomized controlled trial of hydrotherapy. *Arthritis Care Res* 1996;9:206–15.
16. Barlow JH, Macey SJ, Struther JR. Health locus of control, self-help and treatment adherence in relation to ankylosing spondylitis patients: Patient Education Council Special Issue. *Psychosoc Aspects Rheum Dis* 1993;20:153–66.
17. Brown A. *Groupwork*. London: Ashgate Publishing, 1992.