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Systematic review of exercise and the long-term outcomes of the treatment for obesity. By T.J. BROWN¹, A. AVENELL¹, J. BROOM², W.C.S. SMITH³, R. JUNG⁴, M.K. CAMPBELL¹ and A.M. GRANT¹, ¹*Health Services Research Unit, University of Aberdeen, Foresterhill, Aberdeen AB25 2ZD*, ²*Grampian University Hospitals NHS Trust, Aberdeen Royal Infirmary, Foresterhill, Aberdeen AB25 2Z*, ³*Department of Public Health, University of Aberdeen, Foresterhill, Aberdeen AB25 2ZD* and ⁴*Tayside University Hospitals NHS Trust, Ninewells Hospital, Dundee DD1 9SY*

We systematically reviewed randomised controlled trials (RCTs) of obesity treatments in adults and assessed long-term effects on weight and risk factors for disease.

RCTs of exercise were included only where exercise was provided in conjunction with dietary advice. RCTs had to have a mean follow-up of at least 1 year and had to recruit adults with a mean baseline BMI of at least 28 kg/m². An exercise intervention was classified as such if a detailed programme of exercise was reported. If participants were advised to simply take more exercise this was not classed as an exercise intervention. The main outcomes assessed were weight, lipids, blood pressure and glycaemic control.

Thirteen electronic databases were searched and key journals were hand-searched. Three studies examined the effects of diet and exercise versus control, twelve studies examined the effects of diet and behaviour therapy and exercise versus control, five studies assessed the added effects of exercise to diet, two studies assessed the added effect of behaviour therapy and exercise to diet and seven studies assessed the added effect of exercise to diet and behaviour therapy.

The added effect of exercise to diet was associated with a weighted mean difference (WMD) weight change of -1.95 kg (95% CI, -3.22 kg to -0.68 kg) at 12 months, -7.63 kg (95% CI, -10.33 kg to -4.92 kg) at 18 months and -8.22 kg (95% CI, -15.27 kg to -1.16 kg) at 36 months. Two studies demonstrated beneficial effects of adding exercise to diet at 12 months for HDL cholesterol (WMD 0.1 mmol/l; 95% CI, 0.06 to 0.14 mmol/l) and for triacylglycerols (WMD -0.18 mmol/l; 95% CI, -0.31 to -0.06 mmol/l).

The added effect of exercise to diet and behavioural therapy was associated with a WMD weight change of -3.02 kg (95% CI, -4.94 kg to -1.11 kg) at 12 months and -2.16 kg (95% CI, -4.20 kg to -0.12 kg) at 24 months. Few studies presented changes in risk factors, with only one statistically significant result for the added effect of exercise being associated with a deleterious increase in LDL cholesterol at 24 months (WMD 0.28 mmol/l; 95% CI, 0 to 0.56 mmol/l), based on one small study only.

At 1 year, the addition of exercise to diet was associated with improved weight loss and risk factors. The data suggests that a prescribed exercise programme is particularly important in long-term weight maintenance. The amount and type of exercise received by participants varied across studies. Also in some studies the exercise component accounted for extra contact visits, therefore it might have been the extra contact time rather than the actual exercise intervention that produced increased weight loss.

Methodological limitations included inadequate sample size and reporting. Only two small studies examined exercise as an adjunct to diet post-12 months. Few studies reported risk factor outcomes and there was very little evidence regarding the additional effect of exercise on clinical outcomes.