A telephone-delivered behavioural intervention confers a small reduction in body weight in people with Type 2 diabetes

Synopsis


Question: Does a telephone-delivered intervention aimed at increasing physical activity and improving dietary intake serve to reduce weight, increase physical activity and improve glycaemic control in people with Type 2 diabetes?

Design: Randomised controlled trial with blinded outcome assessors.

Setting: The participants’ homes in the city of Logan, Australia.

Participants: People were eligible to participate if they were aged 20–75 years, had Type 2 diabetes, were inactive, had a body mass index ≥ 25 kg/m², were not using weight loss medication, and had no previous or planned bariatric surgery. Randomisation, using the minimisation method, allocated 151 participants each to the intervention and control groups.

Interventions: Over a six-month period, the intervention involved 14 phone calls which comprised motivational interviewing, focusing on the benefits of weight loss and lifestyle changes together with goal setting to achieve specific targets related to weight loss, physical activity, and dietary intake. Participants were also provided with a workbook, a pedometer (to monitor daily step counts), and a set of digital scales (to monitor body weight). They were encouraged to achieve weight loss through exercise (≥ 210 minute/week) and a reduction in energy and total fat intake. The control group received generic self-management brochures about Type 2 diabetes.

Outcome measures: The primary outcomes were weight loss, accelerometer-derived moderate to vigorous physical activity, and glycosylated haemoglobin (HbA1c).

Results: A total of 279 participants completed the study. On completion of the intervention period, compared with those in control group, those in the intervention group achieved greater weight loss (~1.1%, 95% CI –1.9 to –0.3). This between-group difference was equal to ~1.1 kg. The intervention group also performed more physical activity (30%, 95% CI 8 to 57). This between-group difference was equal to 31 minutes of moderate to vigorous physical activity per week. There were no differences in HbA1c.

Conclusion: Telephone-delivered motivational interviewing was a pragmatic option for encouraging a healthier lifestyle and conferred benefits in weight loss and physical activity for adults with Type 2 diabetes.

Commentary

The prevalence of Type 2 diabetes and other metabolic disorders is rapidly increasing, perpetuating a clear and present public health risk (Wild et al 2004). There is substantial evidence that intensive clinic-based lifestyle interventions targeting increased physical activity and reduced energy intake are effective in producing significant weight loss and improving Type 2 diabetes biomarkers (Norris et al 2004). However, evidence is lacking regarding the feasibility of translating these interventions into the wider community.

The ‘Living Well with Diabetes’ trial described in this paper delivered a weight loss intervention entirely over the telephone in an attempt to increase program reach beyond the metropolitan clinic setting. It used an evidence-based combined approach of increasing energy expenditure through physical activity, and reducing energy intake through healthy eating principles; importantly it incorporated behavioural change strategies to target and individualise the program according to participant need and circumstances, to increase program uptake and adherence.

Although the program conferred benefits in weight loss, energy intake reduction, dietary quality and physical activity, the effects sizes were relatively small with few Type 2 diabetes participants meeting program targets. Additionally, no change in blood glucose was detected, possibly due to lack of program focus on medication adherence. Effects were greatest in program completers who received the majority of calls, favouring those who were retired.

Study outcomes point to the dilemma for clinicians of targeting programs to those most able or motivated to change compared with a ‘take all comers’ approach, to optimise inclusion of those from socially disadvantaged and minority groups. It is likely that more flexible modular approaches in goal setting and delivery, including internet and pervasive smart phone technology, will be necessary to achieve greater program impact and reach, as demonstrated in successful secondary prevention of cardiovascular disease (Neubeck et al 2011).

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References

Repetitive facilitative exercise improves upper limb function in patients with subacute stroke

Synopsis


Question: Does repetitive facilitative exercise improve paretic upper limb function in individuals with subacute stroke? Design: Randomised, controlled trial and blinded outcome assessment. Setting: Two inpatient rehabilitation centres in Japan. Participants: Adults with confirmed stroke of 3–13 weeks duration and upper limb Brunnstrom Stage ≥ III (beginning voluntary movement) were key inclusion criteria. Cerebellar lesions, and arm contractures/pain were key exclusion criteria. Randomisation of 52 participants allocated 27 to the repetitive facilitative exercise (RFE) group, and 25 to the control group. Interventions: Both groups were trained for 4 weeks (40 min/day, 5 days/week). In the RFE group, repetitive facilitative techniques were used to elicit movement of different joints of the paretic upper limb. Each subject received a total of 100 standardised movements of at least 5 joints in the paretic upper limb. The control group underwent conventional training consisting of range of motion exercises, progressive resistive exercises, and grasping blocks of various sizes. In addition, all subjects, regardless of group assignment, received dexterity-related training for 30 min at the end of each exercise session. Outcome measures: The primary outcome was the Action Research Arm Test (ARAT) scored 0–57 with higher scores indicative of higher levels of function. The secondary outcome was the Fugl Meyer Arm Motor Scale (FMA), with a maximum score of 66. The outcomes were measured at baseline, at 2 weeks after the initiation of the intervention, and immediately after the 4-week training program. Results: 49 participants completed the study. At the end of the 4-week training period, the improvement in ARAT total score was significantly more in the RFE group than the conventional exercise group (by 6.5 points, 95% CI 2.0 to 11.0). Analysing the ARAT subscale scores revealed that the RFE group had significant more improvement than the conventional exercise group in Grasp (by 2.5 points, 95% CI 0.7 to 4.3) and Pinch subscales (by 2.7 points, 95% CI 0.7 to 4.6), but not Grip (by 0.9 points, 95% CI –0.2 to 1.9) and Gross Movement subscales (by 0.5 points, 95% CI –0.5 to 1.4). The FMA score also demonstrated significantly more improvement in the RPE group than the conventional exercise group (by 5.3 points, 95% CI 1.0 to 9.5). Conclusion: The RPE program is more effective than conventional exercise training in improving upper limb motor function in people with subacute stroke.

Commentary

The recovery of upper limb movement and use post stroke is a priority for both the client and therapist. Over the past decade numerous trials have investigated upper limb interventions and their effect on improved movement and use in activities of daily living (ADL) with positive results (Harris et al 2009, Wolf et al 2010, Arya et al 2012). Trials have progressed to determine the intensity aspects of intervention. Shimodozono and colleagues developed and investigated an intervention that contributes to this discussion. Research has shown that hundreds of repetitions are necessary to improve use of the paretic upper limb in ADL (Birkenmeier et al 2010). Trials that determine key ingredients of the interventions (eg, dosage, activity, repetitions) will assist therapist decision making and improve client outcome; this is being done for Constraint-Induced Movement Therapy (Page et al 2013). The Shimodozono study outlined the techniques used, repetitions of the experimental intervention, and the amount of time in therapy for both interventions; this type of description allows for replication and further dosage investigations. A concern with this trial, however, is the description of the control group as conventional therapy. The description of the activities includes mostly passive, non-goal directed movement; this would not be considered typical by many therapists. At this stage in upper limb research there are proven interventions that can be used as comparison in order to determine a truly superior treatment. In this trial though the amount of time spent in therapy was equivalent, the repetition of the activities were not; if this had been comparable the conclusion of ‘more effective’ could be made. The conclusion is thus difficult to accept. There is mounting evidence that high repetitions of active, goal directed interventions are necessary for improved upper limb function and therefore need to be a key ingredient in conventional rehabilitation.

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References

Reconstruction surgery is not always necessary for active young people who rupture their anterior cruciate ligament

Synopsis


Question: Does early anterior ligament (ACL) reconstruction plus early rehabilitation improve outcomes 5 years after injury in patients with an ACL ligament tear compared with rehabilitation with the option of delayed surgery? Design: Randomised, controlled trial included blinded outcome assessment. Setting: Two hospitals in Sweden. Participants: Adults aged 18 to 36 years with an ACL tear not more than 4 weeks old to a previously uninjured knee were included. Key exclusion were playing professional sport, being less than moderately active, and having a full thickness meniscal lesion. Randomisation of 121 participants allocated 62 to the early ACL reconstruction group and 59 to a group having the option of delayed ACL reconstruction if needed. Interventions: Both groups received a similar rehabilitation program supervised by physiotherapists in outpatient clinics with goals for attaining range of motion, muscle function, and functional performance. In addition, the intervention group had ACL reconstruction surgery within 10 weeks of injury. The comparison group with the option of delayed reconstruction had ACL reconstruction surgery when presenting with symptomatic knee instability. Outcome measures: The primary outcome was the change in the Knee Injury and Osteoarthritis Outcome score (KOOS) at 5 years. The KOOS comprises an overall score and 5 subscales (pain, symptoms, activities of daily living, sport and recreation, and knee related quality of life) scored from 0 to 100 with higher scores indicating better results. Secondary outcome measures included the short-form health survey (SF-36), the Tegner Activity Scale, and radiographic osteoarthritis. Results: 120 participants completed the study. 30 participants (51%) in the delayed optional ACL reconstruction group proceeded to have reconstruction surgery: 23 at a mean of 11.6 months after injury and the other 7 at between 2 and 5 years. At 5 years, the change in KOOS in the early ACL reconstruction group was 42.9 units and the change in the comparison group was 44.9 units (mean difference 2.0 units, 95% CI –8.5 to 4.5 units). There were no between-group differences for any of the KOOS subscales, SF-36, numbers returning to pre-injury activity level (n = 14 in early ACL reconstruction, n = 12 in delayed optional ACL reconstruction group), or radiographic osteoarthritis (n = 9 in early ACL reconstruction group, n = 4 in delayed optional ACL reconstruction group). Conclusion: After rupture of the ACL ligament early ACL reconstruction surgery did not provide better results than providing a program of rehabilitation with the option of having delayed surgery. Not all young active adults who rupture their ACL ligament require ACL reconstruction surgery.

Commentary

Identifying the best treatment approach for an acute anterior cruciate ligament (ACL) injury is a holy grail for clinicians and researchers. ACL reconstruction has long been considered the treatment of choice for young, active people with an ACL injury. Surprisingly there are few randomised studies comparing the efficacy of surgery to other treatments. A recent systematic review suggests one in three people may not return to their previous level of sport after surgery (Ardern et al 2011).

In the Frobell study a comprehensive assessment of knee impairments, activities, participation, and contextual factors was completed. There was no difference at 5 years between people who had early ACL reconstruction surgery and those who had rehabilitation with the option of delayed surgery, which echoed earlier positive results from the same cohort when they were assessed at 2 years (Frobell et al 2010). People who never had surgery also did just as well as people who had early or delayed surgery. Therefore, for a young, physically active adult with an acute ACL rupture, structured rehabilitation with the option for delayed surgery may be an appropriate approach, and may help avoid unnecessary surgery without compromising short- to medium-term outcomes.

Patients who had early surgery had more stable knees when compared to those who had rehabilitation with or without delayed surgery. Damage to the meniscus, rather than the ACL injury or treatment provided, may be a critical factor in the development of post-traumatic osteoarthritis (Øiestad et al 2009). There may be risk in delaying or avoiding surgery, because there is more chance for an unstable knee to sustain meniscal injury. While no differences were found in radiographic signs of osteoarthritis at 5 years, subtle changes associated with long-term disability and disease may not be visible on X-ray (Chu et al 2010). Five years follow-up may not be long enough to make judgements about the efficacy of operative or non-operative treatment in stalling the progression of osteoarthritis.

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References

No difference in functional outcomes between surgery and physiotherapy for symptomatic patients with a meniscal tear and knee osteoarthritis

Synopsis


Question: Does arthroscopic partial meniscectomy and postoperative physiotherapy result in better functional outcomes than standardised physiotherapy (PT) alone for symptomatic patients with a meniscal tear and knee osteoarthritis (OA)?

Design: A randomised, controlled trial in a 1:1 ratio with concealed allocation.

Setting: Seven US tertiary referral centres.

Participants: Men and women, aged 45+ years with a meniscal tear, mild to moderate OA, symptoms for at least four weeks, managed with medications, activity limitations, or PT. Exclusion criteria comprised having a chronically locked knee, severe OA (Kellgren-Lawrence Grade 4), inflammatory arthritis, or prior surgery to the affected knee. Randomisation of 351 participants allocated 171 to arthroscopic partial meniscectomy followed by PT and 177 to PT alone.

Interventions: Both groups received a similar PT program. The PT program was based on land-based, individualised physiotherapy with progressive home exercises. A phased structured program was designed to decrease inflammation, restore active joint range and neuromuscular re-education of quadriceps (Phase 1), restore muscle strength and endurance, re-establish full and pain-free active joint range, gradual return to functional activities, and minimise gait deviations (Phase 2), and enhance muscle strength and endurance, and return to sports/functional activities (Phase 3). It was recommended that the patient attend PT sessions once or twice weekly for six weeks and perform exercises at home. In addition, the surgery group had arthroscopic partial meniscectomy performed by trimming the damaged meniscus back to a stable rim followed by postoperative PT.

Outcome measures: The primary outcome was change in the physical-function scale of the Western Ontario and McMaster Universities (WOMAC) questionnaire from baseline to six months follow up. Secondary outcomes included the pain score on the Knee Injury and Osteoarthritis Outcome Scale (KOOS) and the physical-functioning scale of the 36-Item Short-Form Health Survey (SF-36).

Results: In total, 330 patients completed the six month follow-up. There was no difference between the groups in change in the WOMAC physical-function score (mean difference 2.4 points, 95% CI −1.8 to 6.5). There were also no significant differences between the groups in the KOOS pain score, SF-36 physical functioning, or frequencies of adverse events. At six months, 51 (30%) active participants in the study who were assigned to PT alone had undergone surgery, and 9 patients assigned to surgery (6%) had not undergone surgery.

Conclusion: Patients with a meniscal tear and mild-to-moderate OA who had arthroscopic partial meniscectomy with postoperative PT did not have better outcomes in functional status and pain at six months than those assigned to PT alone.

Commentary

Recent randomised controlled trials on conservative versus surgical treatment of knee injuries and knee osteoarthritis have indicated no beneficial effect of surgical treatment over physical therapy interventions (Frobell et al 2010, Kirkley et al 2008). In the present study, Katz and colleagues found that arthroscopic partial meniscectomy in combination with physiotherapy did not result in better functional outcomes than physiotherapy alone for patients with a symptomatic meniscal tear and knee osteoarthritis. However, 30% of the patients in the physiotherapy group crossed over to the surgery group within the 6 months follow-up. The authors of this study ask the important question whether patients with early degenerative changes in a symptomatic knee joint will benefit from surgery. Surgical treatment methods have been thought of as necessary for knee injuries, even though sparse high level evidence exists. This study shows that a period of physiotherapy should be performed in this patient group whether surgery is planned or not. A longer physiotherapy intervention may be suggested because a longer intervention may result in a greater treatment effect (Fransen et al 2009). Patients with symptomatic knees eager to return to high level activities or demanding work should go through a physiotherapy program with exercises targeting their activity of interest. Surgery is not inevitable for everybody with a meniscal tear, and surgery is always associated with risks. Importantly, despite a few concerns about the study design, the results from this study indicate that physiotherapy alone should be the first line treatment for all patients with a symptomatic meniscal tear at the knee and mild to moderate OA.

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References