Very low-birthweight preterm infants walk later than term infants, but most are walking by 18 months

Synopsis


**Questions:** Do very low-birthweight (VLBW) preterm infants attain walking later than term infants? What factors predict delayed walking attainment in very low-birthweight preterm infants? **Design:** Inception cohort study with 18-month follow-up. **Setting:** University hospital in Taiwan. **Patients:** Ninety-six VLBW preterm infants were recruited from the neonatal intensive care unit. Inclusion criteria included: gestational age < 37 weeks, birth weight < 1501g, absence of chromosomal or other genetic abnormalities. A comparison group of 82 term infants, born by uncomplicated, spontaneous vaginal delivery, was also studied. Follow-up was 100% at 18 months for preterm infants and 89% for term infants. **Assessment of prognostic factors:** Perinatal and sociodemographic data were collected from medical records. **Main outcome measures:** Parents monitored and recorded the date when the infant could take five successive steps without support. A research assistant made monthly phone calls in the age period 9-18 months to ask questions on motor status and age of walking. Clinical tests of motor function were performed by physiotherapists using the Alberta Infant Motor Scale at six, nine, 12 and 18 months. In 95% of infants, the parent’s record corresponded with the telephone responses and clinic motor tests. In cases of disagreement the parent’s report was considered the age of walking attainment. **Main results:** Eighty-five VLBW preterm infants (89%) attained walking by 18 months whereas all term infants attained walking by 18 months. The median age of walking attainment was greater in the pre-term infants (14 months) than in the term infants (12 months; p < 0.001). Univariate risk factors for failure to attain walking by 18 months (with risk ratios and 95% CI) included: gestational age < 30 weeks (2.67; 1.67 to 4.27), birth weight < 1001g (2.25; 1.40 to 3.60), intraventricular haemorrhage Grade III-IV (5.32; 1.30 to 21.74), duration of ventilation > 7 days (3.64; 2.21 to 5.95), duration of oxygen use > 28 days (2.92; 1.82 to 5.00) and Stage III-IV retinopathy of prematurity (7.25; 2.83 to 18.52). **Conclusion:** Very low-birthweight preterm infants attain walking, on average, about two months later than term infants. The risk of failure to walk at 18 months is nonetheless low (11%). Failure to attain walking by 18 months in VLBW preterm infants is associated with low gestational age, prolonged ventilation, severe retinopathy of prematurity and severe intraventricular haemorrhage.

Commentary

Recent advances in neonatal intensive care and the introduction of surfactant therapy have improved the survival rate of those born at gestational ages of 24-26 weeks. For example in our unit, 54% of VLBW preterm infants survived in the period 1986-1991, whereas 70% survived in the period 1992-1996. Along with the increased survival rate there is now a greater prevalence of cerebral palsy amongst this group. Unpublished data from our unit (Rieger 2000) shows that at three years follow-up, the prevalence of cerebral palsy is 28% (previously 11%). Outcome literature based upon the earlier time period can no longer be valid for today’s neonatal intensive care graduates. The Jeng et al paper provides important and valid information to all involved in the assessment and treatment of premature infants, as it studied a population born in 1995-1997.

The true clinical significance of this paper may be masked by simply categorising preterm infants according to birthweight, as there are a range of additional factors that predict delayed walking. Additionally, low birthweight is not the strongest predictor of delayed walking. Lower birth weight, higher grades of intraventricular haemorrhage, prolonged ventilation and added oxygen plus higher grades of retinopathy of prematurity are all risks of the very premature. All these risk factors are identified prior to the premature infant’s discharge from the intensive care nursery and could be used to target infants for early therapy and assessment. Importantly, the paper found that all VLBW pre-term infants who failed to walk by 18 months had cerebral palsy or psychomotor retardation. These infants would benefit from early intervention, as it was shown that these infants made little or no gains in new motor skills from six months onwards.

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### Synopsis


**Question:** Is exercise and/or taping effective for anterior knee pain: a randomised controlled trial.

**Setting:** Physiotherapy department, United Kingdom.

**Patients:** Subjects aged 16-40 years referred from orthopaedic and rheumatology consultants and general practitioners with a three-month history of anterior knee pain. Patients with a history of true locking or patella dislocation, arthritis, radiographic abnormality, ligament laxity, malignancy, infection or prior physiotherapy were excluded. One hundred and eighty-four subjects were approached, 81 were randomised, 71 completed the intervention and three-month follow-up and 49 completed the 12 month follow-up.

**Interventions:** Subjects were randomised to four treatment groups: (1) exercise, taping and education; (2) taping and education; (3) exercise and education; and (4) education alone. All subjects received education from the therapist and an educational leaflet. The exercise intervention included knee exercises designed to improve the motor skill of the lower limb extensors and to stretch tight structures. Taping was applied in the same manner to each patient: from the lateral border of the patella pulling medially and upwards over the medial femoral condyle. Each group received six sessions over three months. **Main outcome measures:** At three months, satisfaction with treatment was estimated by noting whether subjects had been discharged or had continued with physiotherapy or had been referred to a consultant. At three and 12 months, subjects rated their pain with level walking and stairs, using separate 100mm visual analogue scales, completed the WOMAC lower limb function scale. Measures of isometric quadriceps strength were taken at three months. **Main results:** Subjects who received exercise were significantly more likely to be discharged at three months than those who did not (39/40 exercised vs 21/41 not exercised). There was no effect of taping on rate of discharge (27/39 taped vs 33/42 not taped). At one-year follow-up, the patients who exercised had significantly lower pain scores than those who did not. There were no other significant effects of exercise or taping on outcomes. **Conclusion:** Exercise, but not taping, improves discharge rates for patients with anterior knee pain and provides long term pain reduction.

### Commentary

Physiotherapists are commonly referred patients with anterior knee pain, but until recently there has been little good evidence about the effects of commonly applied therapies. This well-designed trial is a welcome addition to the literature.

The main finding was that subjects given an exercise program were more likely to be discharged within three months than subjects who do not exercise. The effect was quite large, with one more patient discharged at three months for every three patients treated with exercise. Unfortunately, discharge is not an unambiguously good outcome, especially as the data suggest that neither exercise nor taping reduce pain or improve function at three months (data on outcomes at 12 months are difficult to interpret because of the high loss to follow-up). The data do not, therefore, provide strong support for the use of exercise, at least as it was administered in this study.

The “exercises” used in this study were a combination of frequent, brief stretching to lower limb muscle groups, non-specific weight-bearing exercises, and “specific exercises for gluteal muscles”. As such, they differ from the specific exercises proposed by McConnell (1986) and used by many Australian physiotherapists.

The authors commented that taping reduced the pain experienced during exercise, but they found no long term effect of taping either in isolation or in combination with exercise. The patella was taped medially and superiorly in all patients. Many therapists use more elaborate methods of taping, but the effects of these are not known.

This study provides little support for the use of non-specific exercise and simple medial taping for anterior knee pain. A recent randomised trial (albeit one with a large loss to follow-up) reported that a combination of specific exercises and contemporary taping methods was more effective than relatively non-specific exercise (Harrison et al 1999). A randomised trial co-ordinated by physiotherapists at The University of Melbourne may soon provide better evidence of the effects of specific exercise and contemporary taping methods.

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### References


A home program is as effective as in-rooms treatment in the management of distal radius fracture

Synopsis


Questions: Does physiotherapy treatment improve outcome after distal radius fracture more than a home exercise program? Can predictors of poor outcome be identified? Design: Randomised, blinded controlled clinical trial. Settings: Multicentre orthopaedic hospital outpatient and physiotherapy clinics, UK. Patients: Ninety-six patients aged over 55 years with unilateral distal radius fracture treated initially by immobilisation in plaster. Minimal test scores of eight or more, not participating in other clinical trials, no previous problems in the affected wrist or reflex sympathetic dystrophy at time of plaster removal. Patients were randomised into one of two groups. Six patients withdrew by the three-month follow-up period (two in the active group, four in the control group). Intervention: All patients were instructed in a standard home exercise program to be continued three times daily until patients were happy with wrist function. One group of patients also underwent a course of physiotherapy (content not standardised) and were discharged when improvement ceased. Outcome measures: Six sets of measures were taken on three occasions: initially at cast removal (baseline), three and six months later. Measures were pain (VAS), quality of life (SF36), active range of movement (full circle goniometer) (flexion, extension, pronation, supination, radial/ulnar deviation), grip strength (JAMAR dynamometer), functional assessment (unspecified activities of daily living), radiological measurements (dorsal angulation, radial shift, radial shortening). The last four of these six measures were recorded as the percentage of the unaffected side. Results: The only difference between groups was in flexion/extension, which improved significantly more in the physiotherapy group at six months (estimated marginal mean difference 12.2, 95% CI 5.4 to 19.2, p = 0.001. Predictors of poor outcome were mal-union, high pain scores at baseline, severity of initial fracture, limitation of hand and wrist function prior to fracture. Conclusion: Physiotherapy programs do not produce significantly greater functional outcome than home exercise for patients with distal radius fracture.

Commentary

The role of hands-on physiotherapy in the management of distal radius fractures is controversial. Although clinicians possess much anecdotal evidence regarding of benefits of physiotherapy, randomised trials have failed to demonstrate positive effects of hands-on treatment. The conclusions of this study concur with previous trials, that “many patients are currently being referred unnecessarily for physiotherapy, expending valuable time and effort by both the physiotherapist and patient”. This raises not only professional issues but also ethical and resource allocation dilemmas. We therefore need to closely examine the methodology used in these studies.

Wakefield and McQueen have produced a quality paper which scored highly on the PEDro scale. However, the PEDro scale does not include criteria for selection of appropriate outcome instruments. The choice of instruments is important, as psychometric properties (validity, reliability and responsiveness to detect change over time) partly determine the outcome.

Wakefield and McQueen selected outcome instruments frequently used in physiotherapy research and clinical practice. One needs to consider relevance of these outcomes in patient-centred assessment. We should consider the following: (1) There is no clear relationship between impairment (measured by range of movement, grip strength and pain) and disability (ability to undertake daily tasks; World Health Organization 2000). Therefore disability may not be accurately predicted by impairment measures. (2) There is a lack of evidence regarding validity, reliability and responsiveness for the “functional assessment”. (3) The SF36 contains few upper limb items and has questionable responsiveness to detect change in physiotherapy populations (Mawson 1995).

Therefore, the lack of a physiotherapy treatment effect may have resulted from the selection of outcome instruments. More appropriate patient-specific outcome instruments should be developed before further randomised controlled trials are conducted to determine the efficacy of physiotherapy for the treatment of distal radius fractures.

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References


Kinaesthetic exercise does not improve outcome (or kinaesthesia) in patients with acute whiplash

Synopsis


Question: Does the addition of kinaesthetic exercise to regular physiotherapy care improve pain, disability or self-efficacy in patients with acute whiplash? Design: Randomised controlled trial. Setting: University emergency department and orthopaedic clinic, Sweden. Patients: Subjects aged 18-60 years with acute whiplash Grades 0-3 participated. Most patients had been involved in a road traffic accident, on average 20 days prior to randomisation. Patients with prior neck injury were excluded. One hundred and sixty-five subjects were randomised. Patients with prior neck injury were approached, 22 were excluded, 77 declined to participate, 66 were randomised and 53 completed the six-month follow-up. Interventions: Subjects were referred from an emergency clinic where all patients are advised to resume normal activities as soon as possible. The regular treatment group received posture advice and were advised not to lift or carry heavy items or get the neck cold. They were instructed to alternate rest with activity, were encouraged to walk “a fair distance” every day and were advised not to use a collar unless involved in prolonged driving or reading/studying. They were also instructed to perform range of motion exercises three times per day, cautiously to their pain limit. The additional treatment group received the same program, plus they were instructed to perform “kinaesthetic” exercises designed to improve kinaesthetic sensibility and co-ordination of neck muscles. All patients received four appointments over six months. Main outcome measures: Three and six months after enrolment, disability was measured using the Pain Disability Index (range 0-70), self-efficacy using the Self-Efficacy Scale (range 0-200) and pain using a 0-10 pain scale. Range of motion, head posture and kinaesthetic sensibility were also measured. Main results: There was no statistically significant between-group difference in any outcome. For example, at six months, the mean (SD) scores for the standard care versus the kinaesthetic groups were: pain 2.0 (1.7) vs 1.8 (1.9); disability 15.1 (13.8) vs 15.8 (13.9) and self-efficacy 164 (31) vs 160 (41). Conclusion: Instruction to perform “kinaesthetic” exercise provides no additional benefit to regular care in terms of pain, disability, self-efficacy or kinaesthesia. With both treatment protocols, the average subject remained in pain and disabled at six months.

Commentary

The main conclusion of this study was that a home exercise program is sufficient treatment for acute WAD. However, on average, the patients in this study remained in pain and disabled at six months. These figures hardly provide credence to the authors’ conclusion.

Kinaesthetic deficits have been reported in WAD (Revel et al 1994). The authors addressed this problem in the additional treatment group but concluded that kinaesthetic exercises provided no extra benefit. The exercises involved the subject lying supine and pressing the head into different points of an imaginary quadrangle. No rationale was provided for the selection of these static exercises, and their use is surprising, especially as the kinaesthetic sensibility outcome measure used in the study was a dynamic test of neutral head posture re-location. Previous studies have found a more positive effect with kinaesthetic exercises involving retraining of this dynamic head/neck repositioning (Revel et al 1994) and with the inclusion of eye/head co-ordination exercises in a multimodal treatment program (Provinciali et al 1996). One could imagine that the complex cervical/head and eye co-ordination system might require more dynamic rehabilitation than is provided by the exercises used in this study.

This study’s results indicate that exercises that involve pressing the head into an imaginary quadrangle on the floor provide no additional benefit to a general home exercise program and advice for acute WAD. Due to poor outcomes from either program, it could hardly be concluded that the program is sufficient management of acute WAD. The challenge remains for appropriate diagnosis and physiotherapy management programs to be developed and tested.

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References