

Literature summary for SOM oct-dec 2007

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Predicting poor functional outcome in community dwelling older adults with knee pain: prognostic value of generic indicators. Mallen, Peat, Thomas, Lacy, Croft. *Annals of rheumatic disease* nov 2007 66 (11) p1456-61

Studies investigating predictors of outcome can be a useful guide to clinical decision-making. Clinical practice tends to emphasise diagnosis but pathology may not be the major factor that determines prognosis. General characteristics that are useful indicators of prognosis have been identified for musculoskeletal problems the value of which was investigated by this study in subjects with knee pain.

745 symptomatic individuals, aged over 50 were recruited by postal questionnaires. The authors acknowledge this is a potential limitation of the study as some subjects who may have been eligible to participate may have not returned the questionnaire.

Subjects were given a standardised clinical interview and examination. X-rays were taken of both knees, weight-bearing posteroanterior (PA) semiflexed, supine skyline and lateral views.

The diagnosis of osteoarthritis (OA) was made if any of the following radiographic features were identified;

- Kellgren and Lawrence (K-L) score of 2 or more on the PA view and/or skyline view (which equates to at least one definite osteophyte).
- The presence of superior or inferior patella osteophytes and/or posterior tibial osteophytes on the lateral view.

Follow-up was by postal questionnaire 18 months after baseline clinic attendance.

Main outcome measure was change between baseline and follow-up in the WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index) which has been extensively validated and is widely recommended for use in studies of knee and hip OA.

The WOMAC scores of each participant were categorised into five groups (0–7, 8–14, 15–22, 23–33 and 34–6). A good functional outcome was defined as moving down one group compared with baseline or remaining in one of the two lowest groups. A poor functional outcome was defined as moving into a higher group or remaining within the three highest groups.

The generic baseline variables selected as prognostic indicators included sociodemographic characteristics, lifestyle, self-rated health, body mass index, co morbid health conditions, anxiety and depression, speed and mode of onset of pain, location of pain, duration and severity of pain.

A small overall decline in physical function was observed between baseline and follow-up however functional score at follow-up was strongly related to functional score at baseline

A poor functional outcome was strongly associated with;

- Poor self-rated health at baseline
- Obesity
- Persistent and severe knee pain.
- Older age,
- Anxiety

Gender, alcohol consumption, smoking, whole-leg pain and mode of onset at baseline were not associated with functional outcome at 18-months.

The authors conclude that generic factors found in previous studies to be associated with poor outcome for musculoskeletal disorders also appear to apply to older adults with knee pain. This appeared to be the case whether radiographic evidence of OA was present or not. This study suggests it may be possible to identify a core set of features with prognostic value in the assessment of all musculoskeletal pain.

Radiologic evaluation of chronic foot pain. Joong and El-Khoury. American family physician Oct 2007 76 (7) p975-83

This is a useful article for any one who is able to request imaging or to enable suggestion of appropriate imaging to another practitioner. It describes the various imaging techniques that can be of value in the management of chronic foot pain and using a rating system suggests the most appropriate imaging for various causes of chronic foot pain. It is illustrated with some good examples of radiological and MRI findings.

A summary of the investigations recommended for various foot conditions is given below;

- Arthritis plain radiography
- Freiberg's disease (avascular necrosis of metatarsal head) plain radiography
- Morton's neuroma plain radiography, MRI, Ultrasound
- Painful accessory bones MRI
- Plantar fasciitis plain radiography, MRI, ultrasound
- Reflex sympathetic dystrophy plain radiography, bone scan
- Stress fracture MRI, CT
- Tarsal coalition plain radiography, CT
- Tarsal tunnel syndrome plain radiography, MRI, ultrasound

Clinical measurement of posterior shoulder flexibility. Borstad, Mathiowitz, Minday, Prabhu, Christopherson, Ludewig. Manual therapy nov 2007 12 (4) p 386-9

Posterior shoulder stretching is a frequently used treatment aimed at normalizing joint kinematics in patients with subacromial impingement. A tight posterior capsule results in increased anterior and superior humeral head translations decreasing the size of the subacromial space during shoulder elevation. Tightness in the posterior capsule can also be associated with loss of glenohumeral internal rotation range which has

also been identified as a feature of impingement syndrome. Loss of internal rotation is believed to be indicative of posterior shoulder tightness as this has been demonstrated in cadaver models. To date no reliable or responsive measurement of posterior shoulder flexibility has been demonstrated. This study had 2 aims;

- to determine the intra-rater reliability for measures of posterior shoulder flexibility
- to determine the smallest real difference necessary to detect meaningful clinical changes

Subjects were construction workers involved in overhead activity. They were split into an impingement group of 37 subjects and an asymptomatic control group of 22 subjects. The symptomatic subjects demonstrated at least two positive impingement tests as well as two of the following;

- a painful arc
- pain upon palpation of the rotator cuff or biceps tendons
- pain with resisted glenohumeral motions

Three clinical measures of posterior shoulder flexibility were carried out over an 8-12 week period by the same physiotherapist with a minimum of 6.5 years clinical experience. The time period was selected to reflect the period over which treatment and meaningful clinical change might occur in practice. None of the subjects received any intervention and the average time since onset of pain was 5 years, symptoms were therefore assumed to be stable

In this study all of the symptomatic subjects continued to be symptomatic at the time of re-testing. A goniometer was used to measure internal rotation and supine horizontal adduction.

Internal rotation was measured in supine, an assistant preventing scapular movement. Degrees of rotation were recorded at the end of passive motion at the palpable onset of scapular motion away from the plinth.

Horizontal adduction was measured in supine. In addition a side lying adduction measure was taken using a carpenter's square. The subject was positioned with the top shoulder directly above the lower shoulder and the humerus was passively taken into horizontal adduction. The limit of posterior shoulder flexibility was considered the onset of scapula movement or humerus rotation out of neutral. The distance in centimetres from the top of the plinth to the medial epicondyle was measured by an assistant using the carpenter's square.

None of the three measures appeared to be indicators of posterior shoulder flexibility and did not detect small changes over time. The side lying adduction measure was least reliable for both symptomatic and asymptomatic subjects. This measure has previously been reported as reliable however the authors acknowledge it is not an easy test to perform and that it may have been more reliable in other studies due to practice effects and shorter time periods between testing (5 days).

All measures appeared to be generally less reliable in the symptomatic group demonstrating that a measurement tested to be reliable on healthy individuals may not be reliable on a symptomatic clinical population.

The authors acknowledge the following potential sources of error associated with the relatively complex measurement procedures investigated in this study;

- consistency in positioning
- alignment of measurement devices
- application of manual forces
- detection of scapular motion
- detection of end range

This study demonstrates that despite much treatment for subacromial impingement problems being directed at improving posterior shoulder flexibility it is very difficult to measure and therefore provide evidence of any objective change.

Assessment of diclofenac or spinal manipulative therapy, or both, in addition to recommended first-line treatment for acute low back pain: a randomised controlled trial. Hancock, Maher, Latimer, McLachlan, Cooper, Day, Spindler, McAuley. Lancet nov 10 2007 370 (9599) p1638-43

This study based in Sydney Australia investigated whether the addition of non-steroidal anti-inflammatory drugs or spinal manipulative therapy, or both, resulted in a faster recovery for patients with acute low back pain receiving recommended first-line care.

Australian treatment guidelines for acute low back pain in general practice recommend paracetamol, advice to remain active, reassurance of favourable prognosis and avoidance of bed rest as first line care. Non-steroidal anti-inflammatory drugs (NSAIDs) and spinal manipulative therapy are recommended in addition for patients who have slow recovery. It is not known whether NSAIDs, spinal manipulative therapy, or both, in addition to first line care results in quicker recovery for such patients.

240 patients with low back and/ or leg pain of less than 6 weeks duration presenting to 40 participating GPs were recruited. This gave 80% power. Patients were given advice and paracetamol and randomly allocated to one of four groups;

- diclofenac 50 mg twice daily and placebo manipulative therapy (n=60)
- spinal manipulative therapy and placebo drug (n=60)
- diclofenac 50 mg twice daily and spinal manipulative therapy (n=60)
- double placebo (n=60).

The primary outcome was the number of days to recovery defined in two ways;

- the first pain-free day (pain score 0 or 1)
- the first of 7 consecutive days in which the patient had a pain score of 0 or 1 out of 10.

Participants completed a daily pain diary which was used to calculate time to recovery.

Secondary outcomes were;

- pain (pain score of 0–10)
- function (10-point Patient Specific Functional Scale)
- disability (24-point Roland Morris Disability Questionnaire)

Spinal manipulative therapy was done by 15 private practice based physiotherapists who regularly used spinal manipulative therapy in their clinical practice. Participating physiotherapists had a minimum qualification of a graduate diploma in manipulative therapy.

Participants allocated to spinal manipulative therapy had treatment two or three times per week at the physiotherapist's discretion up to a maximum of 12 treatments over 4 weeks. If the participant recovered before the end of the 4 weeks, spinal manipulative therapy was stopped.

A treatment algorithm based on the views of expert clinicians and researchers was used which permitted the use of mobilisation or high velocity thrust procedures directed at lumbar spine, thoracic spine, sacroiliac joint, pelvis, and hip.

Treatment was adjusted by the physiotherapist to the clinical presentation of the patient reflecting clinical reality therefore treatment was not the same for all patients. Most participants had several low-velocity mobilisation techniques (97%) with a small proportion also having high-velocity thrust techniques (5%). Placebo manipulative therapy was detuned ultrasound.

Adverse reactions to medication were reported including gastrointestinal disturbances, dizziness, and heart palpitations. 11 participants taking active diclofenac treatment and 11 taking placebo reported adverse reactions. No serious adverse reactions associated with spinal manipulative therapy were reported.

There was no difference in the primary outcome of time to recovery between participants taking active or placebo diclofenac. Neither was there any difference in recovery rates between those participants receiving active and placebo manipulation.

Analysis of secondary outcomes showed no significant effects on pain, disability, or global perceived effect at 1, 2, 4, or 12 weeks, when diclofenac or spinal manipulative therapy, or both, were added to baseline care.

The authors conclude that patients with acute low back pain receiving recommended first-line care do not recover more quickly with the addition of diclofenac or spinal manipulative therapy.

Systemic effects of epidural and intra-articular glucocorticoid injections in diabetic and non-diabetic patients. Younes, Neffati, Touzi, Hassen-Zrouer, Fendri, Bejia, Ben Amor, Bergaoui, Najjar. Joint Bone Spine oct 2007 74 (5) p 472-6

This study investigated the systemic effects of local glucocorticoid injections at two sites in diabetic and non-diabetic patients.

Previous studies have shown rapid drops in plasma cortisol levels after intra-articular or epidural glucocorticoid injections due to suppression of the hypothalamic-pituitary-adrenal axis (HPAA), which resolved after a few days or weeks. Penetration of locally injected glucocorticoid into the bloodstream has also shown a systemic anti-inflammatory effect producing improvements at distant sites.

29 patients were involved in this study, 18 women and 11 men. The mean age was 38 years. Each patient was given three injections of 1.5 ml (5.625 mg) cortivazol at 3-day intervals.

18 patients with disc-related sciatica had injection into the epidural space. 4 of these patients were diabetic.

11 patients had injection for frozen shoulder 8 of these were diabetic 2 of which were on insulin therapy.

At baseline and post-treatment visits 1, 7, and 21 days after the third injection, the following tests were done:

- plasma cortisol and ACTH (adrenocorticotrophic hormone) at 8 am
- urinary free cortisol excretion in 24 hours
- fasting and postprandial (after mealtime) blood glucose
- serum cholesterol, triglycerides, sodium and potassium.
- Blood pressure.

Mean systolic blood pressure showed a small but significant increase between baseline and the first two post-treatment visits, but returned to baseline values by the third post-treatment visit. This increase may reflect sodium and water retention as cortivazol is a weak mineralocorticoid. Subjects in this study were fairly young patients and larger blood pressure elevations could occur in patients with a prior history of hypertension or the elderly.

Mean postprandial blood glucose was significantly higher at the day 1 post-treatment visit than at baseline. At the day 7 post-treatment visit, blood glucose remained significantly elevated compared to baseline in the 12 diabetic patients.

In all subjects plasma cortisol and ACTH and urinary free cortisol were markedly reduced at the day 1 and day 7 post-treatment visits compared to baseline. At the day 21 visit, these variables remained diminished in the group given epidural injections. The duration of this effect was not determined by this study. Plasma cortisol and ACTH were normal in the group treated intra-articularly by day 21. Prolonged HPAA suppression may put the patient at risk for adrenal insufficiency if exposed to stressful events.

No significant variations were noted for fasting blood glucose or for serum levels of cholesterol, triglycerides, sodium, and potassium

The authors conclude that local glucocorticoid injections may lead to loss of glucose control in patients with diabetes and advise that blood glucose levels should be monitored closely. Glucose elevation may persist for up to 2 weeks after a single epidural injection in susceptible patients. Local glucocorticoid injections cause greater alterations in postprandial glucose levels than in fasting glucose levels (this is different to systemic glucocorticoid therapy). However considerable variability exists in the biological properties of glucocorticoids. The findings of this study may not therefore apply to other glucocorticoids

A comparison of two Thera-Band training rehabilitation protocols on postural control. Puls and Gribble Journal of sport rehabilitation 2007 16(2) p 74-84

Studies of the use of theraband in the rehabilitation of ankle injuries have shown inconsistent results. There is no consensus in the literature regarding the number, duration of exercise sessions, or over how many weeks and the types of exercises that should be included.

This study compared 2 theraband protocols designed to improve postural control in healthy subjects to a control group. One group carrying out exercises 3 times a week and the other 5 times a week. The control group did no exercise.

The exercises used were 'quick kicks' where the theraband was knotted around the leg of a table to make a loop and the non training leg was hooked through the loop with the quick kicks performed against the resistance of the theraband. The training leg was the stance leg.

There were no differences between the groups and the authors conclude that the theraband protocols used in this study did not impact postural control in healthy subjects. In the absence of ankle pathology subjects may already have had normal postural control and stability which could not be improved further by the training program.

Future studies should look at the effect on injured limbs and on the use of theraband exercises in conjunction with other components of a rehabilitation program. This is a widely used piece of therapeutic equipment for which evidence regarding effective usage is inconclusive.

Early motion for Achilles tendon ruptures: is surgery important? A randomized, prospective study. Twaddle and Poon American journal sports medicine dec 2007 35 (12) p 2033-8

This study compared patients with Achilles tendon ruptures treated with surgery and controlled early motion with a group of patients treated with the same controlled early motion without surgery.

Patients were between 18 and 50 years of age at the time of injury, had normal non-injured legs, and were non-smokers with no other significant medical problems/medications that would impair tendon healing. Most of the injuries were sustained from sporting activities. No subjects were elite athletes. Injuries were up to 10 days old.

There were 20 patients in the operative group and 22 patients in the non-operative group, groups were comparable for age and sex.

The non-surgical group were treated in a hanging equinus plaster of Paris cast for 10 days.

The surgical group were operated on within 48 hours of recruitment and then placed in a hanging equinus plaster of Paris cast for 10 days.

All patients remained non-weight bearing with crutches for a total of 6 weeks. At 10 days from commencement of treatment, the cast was removed, and the patient's limb was placed in a removable below-knee orthosis with the ankle at 20° of plantar flexion. Patients were instructed to remove the orthosis for 5 minutes of every hour and while sitting with the injured leg hanging, practice active ankle dorsiflexion and passive plantar flexion. Particular emphasis was made of the importance of not dorsiflexing the ankle beyond the neutral position and remaining non-weight bearing.

After 4 weeks the removable orthosis was brought to neutral, and the same exercise instructions were again reinforced to the patient. At 6 weeks from beginning treatment, the patients were allowed to bear weight as tolerated with crutches in the orthosis and to remove the orthosis at night.

After 8 weeks the orthosis was removed and patients were encouraged to wean themselves off crutches. Toe-raising exercises were begun using the good leg to support the injured leg. When able to initiate toe raising on the injured leg alone stretching and strengthening exercises were begun with physiotherapy supervision.

One patient in each group was noncompliant and required surgical repair of the tendon before 8 weeks after removing the orthosis and mobilizing without any splintage. Compliance can therefore be an issue when patients are able to remove their own splint.

Follow up was 10 days, 8 weeks, 6 months, 3 months, and 12 months from injury. Outcome measures were ankle dorsiflexion and plantar flexion, calf circumference, squeeze test and the Musculoskeletal Functional Assessment Index (MFAI which is a 100-question validated outcome score for musculoskeletal injuries). There were no significant differences between the 2 groups at any of the follow up appointments for any of these outcome measures.

Randomized studies comparing operative and non-operative treatment of Achilles tendon rupture have suggested improved outcome and superior strength in operatively treated patients. However in these studies non-operatively treated patients have been immobilized for much greater periods of time than surgically treated patients.

The authors conclude the results of this study support early motion in the rehabilitation of both surgically and non-surgically treated Achilles tendon ruptures and that controlled early motion is the most important factor in treatment.