Joint pain and its treatment with acupuncture

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Overview

• Physiological considerations of joint pain
• Applications of acupuncture
• Principles of acupuncture treatment in joint pain conditions
Some Facts...

Rheumatic Diseases:
- “... among the most frequently reported causes of impairment of adult population [...]...major cause of work-related disabilities...”

- “...directly responsible main or secondary cause for over 2 million persons being unable to perform major activity at all and over 5 million having activity limitation...”

Some Figures...

- Second most common cause of consultation in general practice
- Its (combined) costs are only surpassed by cardiovascular disease
- Common cause of disability
- Most commonly treated by acupuncturists
<table>
<thead>
<tr>
<th>Knee osteoarthritis</th>
<th>Knee joint pain</th>
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<tbody>
<tr>
<td>• 1 in 5 women &gt; 60 years has symptomatic OA</td>
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<td>• Knee OA is increasing</td>
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<tr>
<td>– the population ages</td>
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<td>– the prevalence of risk factors increases</td>
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<tr>
<td>• obesity</td>
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<td>• poor levels of physical fitness also rises</td>
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<td>(Woolf and Pfleger, 2003)</td>
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<td>• Up to 8.5 million in the UK affected by joint pain that may be attributed to OA (Arthritis Care, OA Nation).</td>
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<td>• The knee is the most common site of peripheral joint pain</td>
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<td>• In adults ≥ 50 years 23% report severe pain and disability</td>
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<td>(Jinks et al, 2004)</td>
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**Primary (Idiopathic) OA**

- Aging
- Joint Laxity
- Other
  - Metabolic
  - Immune
Primary (Idiopathic) OA

• Mechanical Stress
  – Occupation
  – Obesity
  – Over-/mis-use

• Gender

Secondary Aetiology

• Congenital
• Inflammatory
• Traumatic
• Obesity
• Hormonal
• Other
Clinical Knee Osteoarthritis

• The majority of the management of patients with knee pain is undertaken in primary care
• OA is most likely underlying diagnosis
• Presents radiographically in 70% of community-dwelling adults with knee pain aged 50 and over (Duncan et al, 2006)

Management approaches

• Pharmacological options
• Guidelines suggest non-pharmacological interventions should be first line of treatment
• Patient education, physical therapy, aerobic and strengthening exercise

(ACR, EULAR, UK Primary Care)
Integrated care

- Patients don’t like taking tablets
- People with knee OA want non-pharmacological options for pain relief
  
  (Arthritis Care Report 2004)
- Often choose CAM
- Concept of integrated healthcare
Acupuncture

- Approx 40% of GP practices in England provide access to CAM
- More than 10% of GPs and Physiotherapists use acupuncture
- Systematic reviews
  - Ezzo et al 2001
  - White et al 2007

Mechanisms of Pain in synovial joints

Overview of Physiology
and clinical features
Structure of Normal Synovial Joint

- Bone (Articular Surfaces)
- Cartilage
- Synovium
- Capsule
- Synovial Fluid
- Ligaments

Osteoarthritis VS Rheumatoid Arthritis
Structures able to produce Joint Pain

- Bone (Articular Surfaces)
- Cartilage
- Synovium ?
- Capsule
- Synovial Fluid
- Ligaments
- Tendons, Muscles

Joint enervation

- A-beta fibres
  - Responsible for light pressure
  - Low threshold mechanoreceptors
- A-delta fibres
  - Responsible for high pressure
  - High threshold mechanoreceptors
- C-fibres
  - Pain fibres
  - Sympathetic enervation
Cascade of events: Peripheral Sensitisation

Effects of nociceptor activity

- Effects associated with inflammation:
  - Release of neuropeptides
  - Sensitisation
  - Autonomic reflexes
Effects of inflammation

- Tenderness
  - Lowering of excitation thresholds of Aδ and C fibres
  - Expression of activity by Silent Nociceptors
- Ongoing pain (at rest or with activity)
  - Ongoing discharge patterns
  - Enlargement of receptive fields
- Evidence of Central Sensitization

Clinical Picture

- Functional impairment
  - Joint ROM reduction
  - ADL compromise
- Pain
  - At rest, or with movement
  - Joint tenderness
  - Pain referral
Clinical Examples?

• Typical Pain drawing by an OA knee patient
• Spread of pain in tissues proximal and distal to the origin of pain

Bajaj et al, 2001

Key Points

• Initial events in inflammatory process guide progression of disease
• After a period of time, local changes are not as important as central processing of pain
• Early detection and intervention may hinder progress
Applications of Acupuncture

- Hip
  - Haslam 2001
  - Fink et al, 2002
  - Stener Victorin et al, 2004
  - Witt et al, 2006
- Elbow
  - Fink et al, 2002
  - Haker et al, 1993
- Knee
  - Vas et al, 2004
  - Berman et al 2004
  - Witt et al, 2006
  - Sharf et al, 2006
- Shoulder
  - Kleinhenz et al, 2000

RCT acupuncture for OA knees

- N = 40
- 9 treatments
  - acup 5 points
  - superficial
- WOMAC function ...
  - pain, stiffness; pain threshold
- sample size

Takeda & Wessel *Arthritis Care & Research* 1994; 7: 118-122
RCT acupuncture for OA knees

• Deqi felt ...
  – acupuncture group 14/20
  – control group 11/20
• those 25 who experienced Deqi improved significantly more than 15 who didn’t

OA Knee and Acupuncture

• Ezzo et al, 2001, Arthritis & Rheumatism, 44(4) 819-825
• Aim
  – identify trials of Acupuncture on OA knee
  – assess trial quality and its association with +ve outcome
  – assess pain and function as outcomes of treatment
OA Knee and Acupuncture: Results

- **Pain:**
  - Strong evidence that real AP is better than Sham needling
- **Function**
  - Inconclusive evidence as to superiority of ‘true’ AP
  - Insufficient evidence as to whether AP is similar to ‘usual care’

OA Knee and Acupuncture: Conclusions

- ‘Adequate’ Rx sessions associated with +ve results
  - More than 10 sessions
  - In agreement with textbooks on point selection
- Follow-up evidence do not suggest carryover effects (1-3 mths later)
- Some evidence that relief may last up to a year
Review

Acupuncture treatment for chronic knee pain: a systematic review

A. White, N. E. Foster¹, M. Cummings² and P. Barlas²

Objective

Studies comparing acupuncture with other relatively safe, non-pharmacological interventions, such as exercise, are lacking and future research should address this need in sham controlled studies.

Methods

Reviews of references, knee were treatment and study results meta-analysis acupuncture subscale additional interventions Conclusions

Acupuncture that meets criteria for adequate treatment is significantly superior to sham acupuncture and no additional intervention in improving pain and function in patients with chronic knee pain.

Key words: Acupuncture, Systematic review, Meta-analysis, Chronic knee pain, Osteoarthritis, WOMAC, Function.
Acupuncture as a complementary therapy to the pharmacological treatment of osteoarthritis of the knee: randomised controlled trial
Jorge Vae, Camila Méndez, Emilio Peraza-Milla, Evelia Vega, María Dolores Paredes, José María Ledón, Miguel Ángel Berge, Oigo Gaspar, Francisco Sánchez-Rodríguez, Immaculada Aguilar, Rosario Jurado

- 12 treatments
- Use of the Streitberger placebo
- 12 weeks treatment and follow up
- Description of adequate stimulation
  - 30 mins, deqi felt, at least 9 points
  - Electroacupuncture added

Conclusions: Acupuncture plus diclofenac is more effective than placebo acupuncture plus diclofenac for the symptomatic treatment of osteoarthritis of the knee.

Annals of Internal Medicine

Effectiveness of Acupuncture as Adjunctive Therapy in Osteoarthritis of the Knee
A Randomized, Controlled Trial
Eileen M. Iermann, MD; Liang-Ling Lao, PhD; Patricia Lingenberg, PhD; Wei Lin Lee, PhD; Adele M. K. Colvin, PhD; and Marc C. Hochberg, MD

Conclusions: Acupuncture seems to provide improvement in function and pain relief as an adjunctive therapy for osteoarthritis of the knee when compared with credible sham acupuncture and education control groups.

For author affiliations, see end of text.
Interpretation

After 8 weeks of treatment, pain and joint function are improved more with acupuncture than with minimal acupuncture or no acupuncture in patients with osteoarthritis of the knee. However, this benefit decreases over time.


Acupuncture in Patients With Osteoarthritis of the Knee or Hip

A Randomized, Controlled Trial With an Additional Nonrandomized Arm

Claudia M. Witt,1 Susanne Jena,1 Benno Brinkhaus,1 Bodo Liecker,2 Karl Wengscheider,3 and Stefan N. Willlich1

Conclusion. These results indicate that acupuncture plus routine care is associated with marked clinical improvement in patients with chronic OA–associated pain of the knee or hip.

ARTHRITIS & RHEUMATISM
Vol. 54, No. 11, November 2006, pp 3485–3493
### Efficacy, effectiveness, safety and costs of acupuncture for chronic pain – results of a large research initiative

*Claudia M Witt, Bernd Brinkhaus, Thomas Reintfeldt, Stefan N Willich*

- **Results and conclusions**
  - Findings demonstrate that acupuncture in addition to usual care was an effective and safe treatment.
  - Whether the effects of acupuncture can be attributed primarily to specific or nonspecific mechanisms appeared to depend on the diagnosis, and should be investigated in further studies.
  - Using acupuncture as an adjunctive treatment was more expensive than usual care alone, but was cost-effective according to internationally accepted threshold values.

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**Knee OA Protocols**

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<th>Berman protocol</th>
<th>Keele Protocol</th>
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<td>St35</td>
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<td>St36</td>
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<td>Sp9</td>
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<td>Gb39</td>
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<td>Ki3</td>
<td>St44</td>
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<td>Ki3</td>
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Tentative Clinical Suggestions

• Evaluate irritability
  – Acute or chronic?
  – Differentiation of application according to state of disease

• Such an approach may guide:
  – Intensity of stimulation
  – Location of stimulation
  – Duration of needling
  – Frequencies (if TENS or EAP is used)

Tentative Clinical Suggestions

• ‘chronic’ states
  – Local (de-qi) needling seems applicable
  – Distal needling may further enhance analgesia
  – Lower frequencies
  – Intensity of stimulation high both locally and distally

• ‘acute’ states
  – Distal (de-qi) needling perhaps facilitates analgesia
  – Local needling may need to be ‘gentle’
  – High frequencies locally, low distally
  – Intensity of stimulation needs to be high distally
Conclusion:
• There is credible evidence that TENS reduces postoperative pain through less analgesic demand during the first 3 days after surgery.
• In addition, there is some evidence that suggests a reduction of side effects, like nausea and sedation, from opioid analgesia.
• The effect of TENS is dose-dependent and requires a strong sensation of currents. [...] the assumed optimal frequency dose range, was 85 Hz for conventional TENS.

Tentative Clinical Suggestions

• Consider ANS symptoms
  – Redness, temperature changes, dysesthesia, sweating, subjective (non-explainable) symptoms

• Modification of such symptoms with acupuncture can happen
  – with superficial needling
  – with stimulation of the ear
  – by coordinating needle manipulation with breathing
Conclusions

• Joint pain is a major cause of disability
  – Think of your list!!
• Its processes are just being understood
  – Research in this area started 15 years ago!
• Early intervention in the inflammatory stage is indicated
  – Practice implications

Conclusions

• Physical modalities may initiate processes of inhibition and reversal of central changes
  – TENS, Electroacupuncture, Acupuncture
• Clinical application should be guided by:
  – knowledge of stimulation parameters
  – disease state (acute vs chronic)
Remember...

- Acupuncture is supported by a larger body of evidence than most physiotherapy interventions
  - eg. IFT, US, PEME
  - Mobilisation,
  - Cyriax, MWM
  - Bobath
  - etc.

Ask yourself

- Is acupuncture a ‘last resort’ treatment?
- Is my practice of acupuncture in accordance to sound, evidence based principles?
  - Clinical vs research evidence
- Are my peers informed on these issues?
- If challenged, can I defend my choices?
Any Questions?