Saturday 5 November

7.30 - 8.30 am  Registration
Chairperson Dr Chin Chan (conference convener)

8.30 - 9.00 am  Opening Ceremony  30 mins
Michael O’Brien (cultural welcoming)
Dr Bill Meyers, Federal President
Mr John Hill (Former State Health Minister)
Dr Charles Cassar, SA President

9.00 - 10.00 am  Dr Marco Romoli,  60 mins
Florence Italy, Keynote Speaker
“Auricular Diagnosis for the General Practitioner”

10.00 - 10.30 am  Dr Ian Relf,  30 mins
Past Federal President AMAC,
Chair of Examination Panel
“The Scientific Case for Acupuncture; as presented to Medicare Australia.”

10.30 – 11.00 am  Morning Tea
Chairperson Dr Matthew Teale

11.00 - 11.45 am  Dr Frank Voyvodic,  45 mins
Senior Staff Specialist,
Division of Medical Imaging,
Flinders Medical Centre
“Management of Chronic Pain - Radiologic Options”

11.45 - 12.15 pm  Dr Charles Cassar,  30 min
President AMAC South Australia
“Biochemistry of Pain”

12.15 – 1.15 pm  Lunch
Chairpersons Dr Charles Cassar

1.15 - 2.30 pm  Round Tables
1. Charles Cassar - “Acupuncture and Macrophage Switching”
2. Chris Chin - “How to Treat TMJD using Local Points and Biomechanical Advice”
4. Emily Teo - “Treating Low Back Pain with Microsystems: Ear and YNSA”
5. Lucy Van Balen - “Window of Heaven Point”

2.30 - 4.00 pm  AMAC AGM

4.00 - 4.30 pm  Afternoon Tea

4.30 - 5.30 pm  Dr Marco Romoli,  60 mins
Florence Italy, Keynote Speaker
“Ear Acupuncture/Auriculotherapy in General Practice”

7.30 pm  Conference Dinner

Sunday 6 November

Chairperson Dr Natasha Kustura

8.30 - 9.15 am  Dr Andrew Wilkinson,  45 min
Rehabilitation and Pain Physician.
Griffith Rehabilitation Hospital,
Hindmarsh Specialist Centre and
Mount Gambier Hospital
“The Latest on Opioids”

9.15 – 9.45 am  Dr Andrew Jan,  30 min
Emergency Medicine Specialist
“Ear Acupuncture for Acute Pain in the Emergency Setting: a systematic review”

9.45 - 10.15 am  Morning Tea
Chairperson Dr Katrina Watson

10.15 – 12.15 pm  Dr Marco Romoli,  120 mins
Florence Italy, Keynote Speaker
“Auricular Diagnosis and Therapy of Neuropathic Pain”
Lecture and Interactive Clinical Demonstration of Diagnostic Technique and Treatment.

12.15 – 1.30 pm  Lunch
Chairpersons Dr Charles Cassar

1.30 – 3.00 PM  Round Tables
1. Chin Chan - “Auricular Acupuncture for Lower Limb Pain”
2. Natasha Kustura - “Combination of Various Acupuncture Modalities in Treatment of MIGRAINES”
3. Bill Meyers - “PTSD and Auricular therapy +/- mention of CSA”
4. Ian Relf - “Several Common Thumb, Hand and Wrist injuries - Treatment and Anatomical Considerations”
5. Matthew Teale - “Stress and Urticaria - treatment with Auricular Acupuncture and body points”
6. Mark Teng - “Minimise the Number of Points”
7. Katrina Watson - “Unusual Diagnoses”

3.00 – 3.15 pm  Close of Conference
Dr Bill Meyers Federal President

3.15 – 3.45 pm  Afternoon Tea
Dr Marco Romoli graduated cum laude in Medicine at Florence University in 1973, afterwards cultivating his interest in acupuncture which he studied in:

- Japan, at Kitasato Center for Oriental Medicine of Tokyo, directed by Dr. Yoshio Manaka;
- Italy, at Istituto Italiano di Agopuntura of Turin, directed by Dr. Luciano Roccia; Austria, at Ludwig Boltzmann Institut für Akupunktur of Vienna, directed by Dr. Johannes Bischko.

At Paris University he obtained a master’s degree in manipulative medicine entitled "Médicine Orthopédique et Thérapies Manuelles", under the direction of Dr. Robert Maigne.

Further complementary techniques of interest for him are neural therapy (Neuraltherapie) and posturology.

He was lecturer at both master courses held by Florence University (Italy) on Posturology and Traditional Chinese Medicine. He is currently lecturer at master course of Integrative Medicine held by Florence University. He is directing special courses on Ear Acupuncture in different schools of Italy and abroad.

From 1996 to 2002 he was in the board of Cochrane Collaboration and cofounder of the Field for Alternative and Complementary Medicine.

For the last 30 years he has been conducting pioneering research and has published several articles and books on auricular diagnosis and therapy (see list of publications). Dr Romoli has constantly tried to interpret and combine data offered by the different schools of auriculotherapy.

In 2008 he was awarded the Prix International Paul Nogier.
Dr Ian Relf, MBBS, BSc(Hons), MSc, Dip RACOG, FRACGP, FAMAC.
Ian Relf is the immediate Past Federal President of the AMAC. He has been a GP for 25 years and practicing Medical Acupuncture for 15 years. He has an appointment at the Austin Cancer Centre in Melbourne, is on AMAC Examinations Board and Federal Board, and is a Medical Expert panellist for the NSW Health Commission. He currently practices in Melbourne treating chronic pain with medical acupuncture using needles and laser. He is a published author, has conducted a positive clinical trial on knee pain at the University of Melbourne, and has recently submitted/accepted an evidence-based review of Acupuncture trials.
Medical Acupuncture: Proof of Concept

AMAC 2016

Dr. Ian Relf
MBBS, BSc Hon, MSc (Monash/PHH), DipRACOG, FRACGP, FAMAC
Austin Cancer Centre - Medical Acupuncturist
Research Fellow Melbourne University
AMAC Examination Chair & Board Member.

Excerpt – AMAC Medicare Review
Proof of Concept 2016
- Summary

- A diverse range of Level 1 evidence is available to support the use of medical acupuncture in the treatment of the musculoskeletal and neurological conditions that are the focus of this first AMAC Medicare MBS submission – ‘Proof of concept’.
- Its use in the treatment of these conditions has long been endorsed by the WHO, Cochrane reviews, individual studies and more recently by substantial systematic reviews/meta-analyses.
- Clearly the earlier disputed evidence does not reflect the much stronger and un-refuted evidence available today. This has certainly been the case, for example, in terms of the Cochrane reviews of tension-type headache and migraine prophylaxis, where the availability of additional evidence has now led to the Cochrane review now supporting the use of medical acupuncture for these conditions.

AMAC - Proof of Concept
Demonstrates the Historical improvement to the evidence

2012 - Overall analysis highly positive
>17,922 patients

- Acupuncture for Chronic Pain
- JAMA - Meta-analysis positive

Effect size in Meta-analysis
- It is well recognized in meta-analysis that a treatment effect:
  - (i) +0.2 signifies a small effect size,
  - (ii) +0.4 a medium effect size, and a value of
  - (iii) +0.8 or greater indicates a large effect size.

Further significant evidence supporting proof of concept:

- PAIN PERCEPTION
  - A systematic review of pain perception by has demonstrated that acupuncture reduces pain thresholds and pain perception– a clear demonstration of physiological effects of acupuncture on pain. (Baumier et al 2014)

- Cost and Mortality Reduction
  - A Dutch study of 350,000 people over 21,000 postcodes showed significant reductions in healthcare costs (which increased with age), and remarkable reductions in mortality rates from those patients whose doctors used acupuncture (1-35%). (Kooreman & Baars 2012)
Further significant evidence supporting proof of concept:

- **CANCER**
  - A trial (N=305) in cancer patients showed highly significant improvements in fatigue, quality of life and anxiety and depression.
  - This is a properly conducted British trial demonstrating that acupuncture has significant general effects on patient recovery, mental state and activity levels. (Molassiotis et al 2012)

- **Headache - Real world trial in General Practice**
  - British General practice trial (Wonderling et al 2004) demonstrates significant ‘real world’ beneficial outcomes for patients in long-term treatment of headache in primary care; highly significant reductions in headache (p<0.0002), reductions in days off and medication use. It was also cost effective compared with a number of other interventions provided by the NHS.

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**Cochrane - still problematic**

- Still uses compromised trials.
- Trials with inadequate comparator groups.

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1. **Cochrane TCM meta-analysis - flawed**

   - **Background:** One of the basic and important principles of Traditional Chinese Medicine theory is syndrome differentiation, which is widely utilized for individual diagnosis and in the application of acupuncture treatment. However, the impact of syndrome differentiation on therapeutic effect is unclear because of insufficient supportive clinical evidence.
   - **Objective:** The aim of this study was to analyze current Cochrane Database systematic reviews of acupuncture and to evaluate differences in therapeutic effects of acupuncture treatment when syndrome differentiation is utilized, compared to when this approach is not utilized. (Fixed points)
   - **Methods:** Cochrane Database systematic reviews of acupuncture were included if the reviews had sufficient data to perform subgroup analyses by syndrome differentiation applied during acupoints’ selection. Searching was conducted across all available articles of the Cochrane Library, and the search concluded in July 2011.

   - **Results:** Forty-four trials from five Cochrane reviews were included in 10 subgroup meta-analyses. Seven meta-analyses showed that there were no differences between trials using fixed acupoints prescriptions and trials using individualized treatment based on relevant symptom improvements for acute stroke, depression, epilepsy, migraine, and peripheral joint osteoarthritis (OA). The remaining 3 meta-analyses showed that acupuncture with fixed prescriptions was superior to individualized acupuncture for pain relief of peripheral joint OA, compared to sham control.

   - **Conclusions:** The available evidence showed no significant difference between acupuncture treatment with or without syndrome differentiation. Large, well-designed trials are warranted to address the use of syndrome differentiation for pain as a clinical end point in order to confirm if syndrome differentiation is an advantageous way of using syndrome differentiation to achieve better therapeutic effects with acupuncture.

   - **PROBLEM** The fixed point trials are derived from TCM understanding of acupuncture. The treatment protocols therefore overlap and thus the comparison is flawed.

---

2. **TCM – Cochrane Meta-analysis**

   - **Background:** One of the basic and important principles of Traditional Chinese Medicine theory is syndrome differentiation, which is widely utilized for individual diagnosis and in the application of acupuncture treatment. However, the impact of syndrome differentiation on therapeutic effect is unclear because of insufficient supportive clinical evidence.

   - **Objective:** The aim of this study was to analyze current Cochrane Database systematic reviews of acupuncture and to evaluate differences in therapeutic effects of acupuncture treatment when syndrome differentiation is utilized, compared to when this approach is not utilized. (Fixed points)

   - **Methods:** Cochrane Database systematic reviews of acupuncture were included if the reviews had sufficient data to perform subgroup analyses by syndrome differentiation applied during acupoints’ selection. Searching was conducted across all available articles of the Cochrane Library, and the search concluded in July 2011.

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**Level 1 - Neck Pain – Lancet 2009 - Laser acupuncture**

- **Efficacy of low-level laser therapy in neck pain: a systematic review.**
  - Roberta T Chow, Mark I Johnson, Analine T J Lopez Martes, Jan M Bjordal

  - 16 RCT’s (820 patients)
  - RR for pain improvement of 4.05 (2.74–5.98)
  - Acute & chronic neck pain

**Conclusions**

- Laser - LLLT - reduces pain immediately in acute neck pain
- Chronic improvement neck pain lasting >5mo
Level 1 Headache Acu

- Systematic review of 31 RCT's.

Significantly Less – medication
↓ Pain intensity, frequency
& physical function, response rate.

H/A Intensity (Mean Diff: -8.54, 95%CI: -15.52, -1.57)
H/A Frequency (Mean Diff 0.70, 95%CI: -1.38, 0.02)
Physical Function (4.16, 95% CI: 1.33, 6.98)

Headache - Level 1 evidence

  Acupuncture in patients with headache.
  Source Institute for Social Medicine, Epidemiology, and Health Economics, Charité Medical Centre, Berlin, Germany.

  - N = 15,056
  - At 3 months, P < 0.001
  - Acu headache days decreased from 8.4 to 4.7
  - Control 8.1 to 7.5
  - Similarly, intensity of pain and quality of life improvements were more pronounced in the acupuncture vs. control group (P < 0.001).
  - Treatment success was maintained through 6 months.
  - Conclusion: The outcome changes in non-randomized patients were similar to those in randomized patients. Acupuncture plus routine care in patients with headache was associated with marked clinical improvements compared with routine care alone.

  Acupuncture for chronic headache in primary care: large, pragmatic, RCT trial.
  Vickers AJ et al

  - 401 patients Tx for 12 months vs USUAL Care.
  - Headache score at 12 mo – 34% reduction of 16.2, SD 13.7, n = 161, 34% (22.3, SD 17.0, n = 140, 16% reduction from baseline).
  - Difference between means is 4.6; P < 0.0002.
  - 22 fewer days of headache
  - 15% less medication (P = 0.02),
  - 25% fewer visits to general practitioners (P = 0.10),
  - 15% fewer days off sick (P = 0.2).

Level 1 Peri-operative Acupuncture

- Acupuncture for postoperative pain:
  - A systematic review of 15 RCT's.

  Significantly Less-
  ↓ Pain & Opiates 5 - 10mg

  S/E-Sedation/Pruritis/Dizziness/Urinary retention.
  RR = > 0.6 (>0.2 sig)

“Sham” Acu - Vickers 2012

- Patients receiving acupuncture had less pain, with scores that were:
  - 0.23 (95% CI, 0.13-0.33),
  - 0.16 (95% CI, 0.07-0.25), and
  - 0.15 (95% CI, 0.07-0.24)
  - > SDs lower than sham controls.
  - Small but significant difference.

- Problem is that sham is not a placebo-
  because it has a treatment effect.
Dr Frank Voyvodic, MB BS (Hons) Adel Uni 1989
FRANZCR
Senior Staff Specialist, Division of Medical Imaging,
Flinders Medical Centre

Partner, Benson Radiology since 2007
Diagnostic Radiologist with special interest in all aspects
of Body imaging, Magnetic Resonance Imaging and
imaging guided pain management.
Dr Charles Cassar has been an active member of the Australian Medical Acupuncture College since 1983, he has been a general practitioner in Adelaide since that time and he is the current president of the South Australia/Northern Territory branch of AMAC. This lecture is based on the latest research in the area of pain management.
Biochemistry of pain and The Unification Theory of Pain

Dr Charles Cassar November 2016

- nociceptive and neuropathic pain,
- acute and chronic pain,
- peripheral and central pain including windup, neuroplasticity and central sensitization

are a continuum of inflammation and the inflammatory response

Unification theory of pain

- Tissue injury may arise from a physical, chemical or biological trauma or irritation.
- Degeneration of tissue subsequent to aging or previous injury can also lead to inflammation.
- Injured tissues can be muscle, ligament, disks, joints or nerves.

Unification theory of pain
• REDNESS
• HEAT
• SWELLING
• PAIN
• LOSS OF FUNCTION

INFLAMMATION

History of the science

- Celsus encyclopaedist, the four humors
- 1858 Rudolph Virchow, functio laesa, Cellularpathologie
- 1892 Elie Metchnikoff, cellular immunity
- Paul Ehrlich, humoral theory of immunity
- 1896 Jules Bordet, discovery of complement
- Robert Koch, Louis Pasteur, the germ theory

Gate control theory of pain
The Gate Theory proposed that small (C) fibres activated excitatory systems that excited output cells—these latter cells had their activity controlled by the balance of large-fibre (A-beta) mediated inhibitions and were under the control of descending systems.

**What the gate theory explains**

The Gate Control theory does not provide an explanation of the biochemical and molecular mechanism of neuronal activation and transmission, does not explain the pathophysiology of pain syndromes and does not provide a road map for treatment of all pain syndromes.

**What it doesn’t explain**

**Four Components of Inflammation**

- Inducers
- Sensors
- Mediators
- Target Tissue

**Inducers**

- PAMP : pathogen associated molecular patterns
- DAMP : damage associated molecular patterns

**Inducers**

- PAMP
  - Gram negative cell wall parts
  - Gram positive cell wall parts
  - Bacterial DNA
  - Viral RNA
  - Etc etc 10^3 identified
Inducers

- DAMP
  - Endogenous stress signals
    - e.g., uric acid
    - ATP

Inducers

- Internal Cell components
- Microbial cell wall fragments
- Irritant Chemicals
- Auto-immune reactions

Inducers

- The key event upon necrotic cell death is thought to be the release of DAMPs from intracellular stores.

Sensors

- Toll-like receptors, on surface of macrophages....single membrane receptors
- TRP (transient receptor potential) channels....ion channel receptors

Inducers

Matzinger in 1994 proposed the danger hypothesis:

The adaptive immune system evolved to respond not to infection per se but to non-physiological cell death or stress.

Inducers

The biochemical mediators produced by the immune cells include:
- prostaglandin,
- nitric oxide,
- tumor necrosis factor alpha,
- interleukin 1-alpha,
- interleukin 1-beta,
- interleukin-4,
- interleukin-6 and
- interleukin-8,
- histamine,
- serotonin.
Cell enzymes that catalyze reaction pathways and generate these biochemical mediators of inflammation include:

- Cyclo-oxygenase (COX),
- lipoxygenase (LOX).

A cell enzyme that is activated by inflammatory mediators such as TNF-alpha and interleukin-1 is Gelatinase B or Matrix Metallo-Proteinase 9 (MMP-9).

The biochemical mediators produced by the nerve cells include:

- inflammatory protein Substance P,
- glutamate,
- calcitonin gene-related peptide (CGRP) neurokinin A
- vasoactive intestinal peptide.

At the nerve cells

The presence of Substance P and other inflammatory proteins such as calcitonin gene-related peptide (CGRP) neurokinin A and vasoactive intestinal peptide removes magnesium induced inhibition and enables excitatory inflammatory proteins such as glutamate and aspartate to activate specialized spinal cord NMDA receptors.

At the nerve cells

Does Inflammation occur in nerve tissue?

Arachidonic acid metabolites and Inflammation

Role of spinal NMDA receptors, protein kinase C and nitric oxide synthase in the hyperalgesia induced by magnesium deficiency in rats

Sophie Begon, Gisele le Pickering, Alain Eschalier, Andre Mazur, Yves Rayssiguier & Claude Dubray

British Journal of Pharmacology (2001) 134, 1227 ± 1236

Magnesium (Mg)-deficient rats develop a mechanical hyperalgesia.

These results demonstrate that Mg-deficiency induces a sensitization of nociceptive pathways in the spinal cord which involves NMDA and non-NMDA receptors. Furthermore, the data is consistent with an active role of PKC, NO and, to a lesser extent substance P in the intracellular mechanisms leading to hyperalgesia.

What about Neuropathic pain

Substance P (SP)

Mast cell activation with sciatic nerve injury
- Invasion of endoneurial neutrophils into damaged nerves
- Macrophage recruitment
- TNFα

An important early event in the induction of neuropathic pain states is the release of Substance P from injured nerves which then increases local Tumor Necrosis Factor alpha (TNF-alpha) production.

Neuroimmunology

Mast cell degranulation activates a pain pathway underlying migraine headache.

PMID 17459586
Studies have been performed to elucidate the pathophysiologic mechanisms leading to sciatica. The studies comprise assessment of structural and functional changes as well as pain and have shown that the intervertebral disk (nucleus pulposus) may induce changes in a nerve root after local application in the absence of a mechanical component. Such changes may for the first time present a biologic or biochemical basis for the development of sciatica. Disk-related cytokines, in particular tumor necrosis factor (TNF), have been found to mediate such changes, and clinical trials have now been initiated to assess the possibility of treating sciatica with selective inhibition of TNF.

PMID: 11793146

Phases of inflammation

1. Inhibition of further recruitment of inflammatory cells.
2. Induction of neutrophil apoptosis and clearance (efferocytosis).
3. Egression (exiting) of immune cells following efferocytosis.
4. Modulation of the immune response to help deal with subsequent encounters.
5. Induction of tissue repair to return to homeostasis.

Key functions of SPMs

- From AA.....lipoxins
- From EPA....resolvins
- From DHA....protectins and maresins

Specialised Pro-resolving Mediators ..........SPM’s

Resolution is active not passive

The Resolution Code of Acute Inflammation

Resolution is active not passive

PMID: 11793146


Radicular pain - recent pathophysiologic concepts and therapeutic implications.
SPMs control the magnitude and duration of inflammation, infection and tissue injury

Charles Sherhan et al

Resolution is an active process.

Ortega-Gomez A et al

MACROPHAGE SWITCHING

Maresin activates and stimulates M1 to M2 phenotype-switch.

Efferocytosis
Lipid Mediators, EPA DHA
Cell Signaling (JNK, PI3K, JAK-STAT)

M1
Cytokines
miRNAs/miRNome

M2
Anti-inflammatory

Up-Regulated
MHC-II
IL-10
TNF-alpha
IL-10R

Down-Regulated
IL-10R
Ym-1

Pro-inflammatory
LPS, IL-21

Up-Regulated
Ang-1
IL-10
Ym-1

Down-Regulated
IL-6
TNF-alpha
INOS
Acupuncture causes downregulation of M1 and upregulation of M2 macrophages. Thus acupuncture reduces pain and swelling.


**FAILURE OF RESOLUTION = CHRONIC INFLAMMATION = CHRONIC PAIN**

Unification Theory

Irrespective of the type of pain whether it is acute or chronic, peripheral or central pain, nociceptive or neuropathic pain, the underlying origin is inflammation and the inflammatory response.

Unification Theory

Unification Theory

Unification Theory

Unification Theory

Unification Theory

Unification Theory

Unification Theory

Unification Theory

Unification Theory

Irrespective of the characteristic of the pain, whether it is sharp, dull, aching, burning, stabbing, numbing or tingling, all pain arise from inflammation and the inflammatory response.
This theory of the biochemical origin of pain is compatible with, inclusive of, and unifies existing theories and knowledge of the mechanism of pain including the gate control theory, and theories of pre-emptive analgesia, windup and central sensitization.

Unification Theory
DR. THOMAS
CHOONG
TREATING ACUTE
NON-MIGRAINOUS HEADACHES -
ACUPUNCTURE AND PERIPHERAL
SENSORY NERVE MODULATION

DR. EMILY
TEO
TREATING LOW
BACK PAIN WITH
MICROSYSTEMS:
EAR AND YNSA
Dr Andrew Wilkinson, Rehabilitation and Pain Physician. Physiotherapist before returning to the Finders post-graduate medical program. Currently employed within the Department of Rehabilitation and Aged Care, Repatriation General Hospital. Consulting at Griffith Rehabilitation Hospital and Hindmarsh Specialist Centre, and Mount Gambier Hospital. Interests include general rehabilitation, musculoskeletal pain syndromes, pain management and rehabilitation needs of the elderly.
Dr Andrew Jan MBBS FACEM BA FAMAC MPhil, has worked as an Emergency Physician in a variety of roles and settings for the past 28 years. He is also a Medical Acupuncturist and a teacher in Taoism. He has recently commenced a PhD on acupuncture for the management of acute pain in the emergency setting. He has publications on acupuncture and other Taoist arts such as Tai Chi, martial arts and meditation.
ED Acupuncture: Ears the Way?

Andrew Jan MBBS FACEM FAMAC BAMPhil
PhD Student (supervisors: Prof. Ian Rogers, Eric Visser, Max Bulsara & research assistant Emogene Aldridge)
University of Notre Dame
St John of God Hospital Murdoch

The story so far...
Last year AMAC 2015 Annual Conference “Systematic Review on All forms of Acupuncture”...

All forms of Acupuncture versus Sham Placebo Effect

Background:
Are we happy with opioids and NSAIDS? Is there a need to investigate acupuncture?

"Is analgesia in the ED helping our patients— or killing them?"


Who cares—why?
Satisfaction intimately linked with pain management but not pain score targets, or opioid use but human factors.

Table 1. Traditional Acupuncture vs. Sham Acupuncture

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<th>Study</th>
<th>ID</th>
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<th>%CM</th>
<th>%D</th>
<th>%N</th>
<th>%CM</th>
<th>%D</th>
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NOTE: Margins are from random effects analysis.
All forms of Acupuncture versus medication?

<table>
<thead>
<tr>
<th></th>
<th>Year</th>
<th>Sample Size</th>
<th>SMD (95% CI)</th>
<th>Weight %</th>
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<td>Goertz et al.</td>
<td>2006</td>
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<tr>
<td>Moss &amp; Crawford</td>
<td>2015</td>
<td>54</td>
<td>2.10 (1.43, 2.77)</td>
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<tr>
<td>Overall (I-squared = 56.4%, p = 0.130)</td>
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-2.77

Favours Standard Care

2.77

Favours Acupuncture as Adjunct to Standard Care

**NOTE:** Weights are from random effects analysis

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*Four studies and mixed results – no conclusion*

**Does it reduce Medication usage?**

- Not sure
What conditions was acupuncture (all forms) used for?

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number of UO studies</th>
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<td>Mixed painful conditions</td>
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<td>Limb Fractures / contusions</td>
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<td>Migraine</td>
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<tr>
<td>Renal Colic</td>
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<tr>
<td>Closed Injuries</td>
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<tr>
<td>Abdo pain</td>
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<tr>
<td>Pharyngitis</td>
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</table>

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number of RCT studies</th>
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<tbody>
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<td>Spine (Back and Neck)</td>
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</tr>
<tr>
<td>Mixed painful conditions</td>
<td>3</td>
</tr>
<tr>
<td>Limb Fractures / contusions</td>
<td>2</td>
</tr>
<tr>
<td>Migraine in children</td>
<td>1</td>
</tr>
<tr>
<td>Dental Pain</td>
<td>1</td>
</tr>
</tbody>
</table>

- Probably about a 1/3 of the RCT or Observational studies measured satisfaction. When measured, there was an improvement in satisfaction or patients ‘would use this treatment again’.

How complex was the acupuncture (all forms) used?

- In both the RCT’s and Observational studies the incidence of potentially significant side effects was about 7 in over 2000 patients. This is consistent with the literature quotes serious adverse events 0.02%. Significant ones that require treatment at 2.2%.

Summary: Pros and cons (all forms of acupuncture)

- Acupuncture from this review provides genuine analgesia, is comparable with standard care, improves analgesia as an adjunct.
- Some studies had flaws. Therefore drop level of recommendation.
- Use where benefits outweigh risks. Further research likely to have an impact. Clinicians should follow stronger recommendations first.
- Where measured patient satisfaction improves.
- Not sure whether it reduces medication usage.
- Low side effect profile.
- Efficacious when simple techniques used - ? For ED staff to learn ear acupuncture.

Background review Chao 2014

- Ear acupuncture for all pain (acute and chronic): 13 studies (806 patients included): SMD 1.59 and I² = 95%
- Acupuncture alone: 494 patients, 7 studies: SMD 1.81 and I² = 96%
- ElectroAcupuncture: 2 studies 37 patients SMD 0.39 I² = 0
- Acupressure: 4 studies 275 patients SMD 1.85 I² = 96%

Review 2010: Asher

All types of pain (8 studies n= 387): SMD =1.56 – strong evidence

Perioperative pain (5 studies, 412 patients): SMD = 0.54 strength of evidence - moderate!

Acute pain: one or two studies - no conclusions

Results from prior reviews: Chao 2014 cont.

Therefore:

Ear acupuncture is effective in chronic and post operative pain relief.

Conclusions not directly applicable to the emergency setting and missed studies (Goertz, Barker) and more since then!
Why repeat the Systematic Review

- More studies? Will include Barker & Goertz.
- Different research question not just acute pain but emergency setting pain
- Specific questions about technique – which is the most effective? Easiest to learn?
- Conditions, Satisfaction, Side effects
- Information for setting up further studies

Does it Work?

- How are we going to judge it?

PRISMA Flow Chart

Eligibility = RCT and Observational studies only

Risk of Bias

- FirstAuthor 1 Adequate randomisation
- 2 Allocation concealment
- 3 Prtblinded
- 4 Practitioner Blinded
- 5 Assessor blinded
- 6 Outcome
- 7 Free of data addressed? selective reporting?
- 8 Other Comments

Allais  L  L  L  L  L  L  L  L : No protocol available

Barker  U  L  L  L  L  L  L  L  L  L : High quality prehospital study. Similar methods for further two studies

Goertz  L  L  H  H  L  L  L  L  L : Protocol available online

What Type of study and Medical Conditions or circumstances was ear acupuncture used for?

Acupuncture versus Sham

Placebo Effect
Ear Acupuncture vs Sham

Ear Acupuncture Overall?

But encouraging

Acupuncture & Standard Care versus Standard Care

How complex was the ear acupuncture used?

Ear Acupuncture as adjunct vs Standard Care

Does it reduce Medication usage?

Not sure
How satisfied are the patients with Ear Acupuncture?

Burns: retrieval 62% “would have treatment again”, 50% mostly satisfied, 21% very satisfied. No conclusions. Barker improvement over sham!

In all forms of acupuncture: 1/3 measured - improvement

Cost of Ear Needles/ Seeds?

- Most do not mention cost. However Barker comments that needles were 3 cents per patient, Goertz $1.52 per patient, Moss $5 patient

Is Ear Acupuncture time consuming?

• The time to administer treatment was Burns (10 minutes) and Barker ~ 6 mins Aliais and Graf 5-10 mins, Gu 1 point (1-2 minutes)

• Probably more important is no impediment to other observations or procedures (except MRI)

Practitioner for Ear Acupuncture

• B.A already taught to over 2800 health care providers

• Taught in a day

• Emergency Physicians, Nurses at triage, Paramedics?

• Difficulties with delivery devices, point finding, real patients!

• Likely to increase acupuncture use for follow up.

Information we need for future Trials on Ear Acupuncture

• Sham controls for the ear is problematic

I. Ear acupoints that are not theoretically effective

II. Nonacupoints on the ear

III. Placebo needles or adhesive patches without pellet/seed

IV. Pseudo-interventions (e.g., switched-off laser, piezoelectric devices

• Practitioner blinding – almost impossible!

• Secondary outcomes as above!

• Acupuncturists versus non acupuncturists
Conclusions: Ear Acupuncture Review

• 7 studies, 5 RCT’s, 4 eligible for meta-analysis. All studies positive for pain reduction over control both clinically and statistically significant. However some issues with quality of studies and patient numbers.

• Use ear acupuncture in emergency setting where benefits outweigh risks. Further research likely to have an impact. Clinicians should follow stronger recommendations first.

• This review should be interpreted in the light of prior ‘ear acupuncture’ and ‘all forms of acupuncture’ reviews.

• Further research required for both efficacy and secondary outcomes to substantiate above review.

Questions?

Contact me please

drandrewjan@gmail.com

www.drandrewjan.com
AURICULAR TREATMENT OF NEUROPATHIC PAIN (HERPES ZOSTER) WITH ASP - SEMIPERMANENT NEEDLES

Herpes Vº, 1. branch
Herpes V°, 2. branch

73-year-old male with post-herpetic neuralgia C2-C3 since 8 months. Limited therapeutic answer to a daily intake of GABAPENTIN 300 mg x 4. 50% improvement of neuropathic pain after 3 applications of ASP
Herpes Th 3

Herpes Th4-Th5
Same patient: 1° treatment

2° treatment (15 days after)

Thank you very much for your attention!

markro@tin.it
COMBINATION OF VARIOUS ACUPUNCTURE MODALITIES IN TREATMENT OF MIGRAINES

AURICULAR ACUPUNCTURE FOR LOWER LIMB PAIN

DR. CHIN CHAN

DR. NATASHA KUSTURA
DR. BILL MEYERS
PTSD AND AURICULAR THERAPY +/- MENTION OF CSA

DR. IAN RELF
SEVERAL COMMON THUMB, HAND AND WRIST INJURIES - TREATMENT AND ANATOMICAL CONSIDERATIONS
DR. MATTHEW
TEALE

STRESS AND URTICARIA
- TREATMENT WITH
AURICULAR ACUPUNCTURE
AND BODY POINTS

MINIMISE THE
NUMBER
OF POINTS

DR. MARK
TENG
The Validation of Auricular Diagnosis
Validierung der Aurikulardiagnostik

Abstract
Background: The first attempt to validate auricular diagnosis in a blind experimental evaluation was made by Terry Oleson in 1980. Now, a new project was proposed for validating auricular diagnosis by means of three methods: Inspection of the outer ear, Pain Pressure Test (PPT), and Electric Skin Resistance Test (ESRT).

Objectives: To find an answer to the following questions:
1. Were the above mentioned diagnostic methods quantitatively equivalent in unveiling the patient’s problems?
2. Were the different methods equivalent in diagnosing recent and old problems?
3. In case of musculoskeletal disorders, were the different methods equally effective in detecting the prevalent side of pain?

Methods: A total of 506 patients were examined in a one-sided blinded trial: 371 females (average age 48.1) and 135 males (average age 46.5). Inspection at first, PPT and ESRT in a random order afterwards, were all performed after having invited every new patient to fill in a form with his old and recent symptoms and diseases in decreasing order of importance.

The first assessor transcribed for each method, on different sheets of the Sectogram, all possible symptoms and diseases thought to be related with the topography of ear skin alterations or the location of the points identified with PPT and ESRT.

The second assessor had the delicate task of working out the number of consistent symptoms, but was free to interpret them as best he could, also speaking to the patient. He also had to verify if there were symptoms which the patient had neglected to mention in the form.

Results: The three diagnostic methods used had different success rates for the identification of patients’ symptoms. Ranging in first place was inspection with 52.2 %, followed by PPT with 33.7 % and ESRT (−) with 33.2 %. Interestingly, if a symptom was identified by at least one method, the success rate rose to 78.6 %.

Regarding the second question, “recent” and “old” problems were defined following the categorization used by Oleson (having occurred < 6 or ≥ 6 months, respectively). The success rates in identifying these two categories of symptoms were very similar for all 3 diagnostic methods.

Regarding the third question, the first assessor could, when diagnosing musculoskeletal disorders, further specify the side of pain (right, left and bilateral). If the pain was bilateral or without prevalence of side, the success rates were higher than expected (inspection 85.2 %, PPT 56.2 %, ESRT(−) 33.7 %).

Zusammenfassung

Zielsetzung: Die Beantwortung folgender Fragen:
1. Besitzen die genannten Methoden eine vergleichbare quantitative diagnostische Aussagefähigkeit?
2. Sind sie gleichwertig in der Beurteilung anamnestischer und aktueller gesundheitlicher Probleme?
3. Sind die Methoden im Fall bestehender musculoskeletaler Probleme gleichwertig darin, eine korrekte Aussage über die Lateralität der Schmerzen zu machen?


Ergebnisse: Die drei Methoden zeigten unterschiedliche Erfolgsraten in der Benennung der Probleme der Patienten. An erster Stelle lag die Inspektion (52,2 %), gefolgt von PPT (33,7 %) und ESRT(−) (33,2 %). Interessanterweise stieg bei Symptomen, die von mindestens einer Methode identifiziert werden konnten, die Erfolgsrate auf 78,6 %. Bezüglich der zweiten Frage wurden anamnestisch länger bestehende und aktuelle Probleme nach denselben Kategorien definiert, die Oleson in seiner Studie verwendet hatte (Aufreten der Symptome vor > 6 Monaten oder ≥ 6 Monaten). Die Erfolgsrate der Identifikation dieser beiden Symptomkategorien war für alle drei diagnostischen Verfahren etwa gleich hoch.

Bezüglich der dritten Fragestellung hatte der Untersucher die Möglichkeit, den Schmerzort ipsilateral, kontralateral
ESRT (−) 20.7 %), as opposed to the cases of ipsilateral (right or left) pain (inspection 51.7 %, PPT 25.3 %, ESRT (−) 14.6 %).

**Conclusions:** Inspection is an essential part of auricular diagnosis, alone or in combination with one or more detection techniques. Its superiority over the other methods confirms the importance given by Chinese authors to this procedure which has been neglected in Western countries. The combination of as many diagnostic methods as possible permits the experienced physician to achieve a relevant diagnostic versatility in detecting health disorders of various origins in his patients.

**Keywords**
Ear Acupuncture, Auricular Diagnosis, Auriculotherapy, Auricular Acupuncture Diagnosis

**Introduction**

The term auricular diagnosis was proposed officially by Terry Oleson in 1980 [1]. His study, conducted at the Department of Anaesthesiology at UCLA School of Medicine in Los Angeles, has the full right to belong to the history of ear acupuncture. Its aim was to evaluate the claims by French and Chinese acupuncturists that a somatotopic mapping of the body is represented upon the external ear. Forty patients were examined by a physician to determine which of 12 reported areas of their body suffered musculoskeletal pain (Figure 1). Each patient was then covered with a sheet to conceal any visible physical problems. A second physician afterwards carried out a blind examination of the patient’s auricles for areas of higher tenderness or reduced electrical skin resistance. The ear points corresponding to body areas where the subject reported musculoskeletal pain were designated as ‘reactive points’, while ‘non reactive points’ corresponded to areas of the body where the patient experienced no discomfort.

The results of Oleson’s article were as follows:

1. The correct identifications summed to 75.2 %. In 12.9 % of the total the points were falsely positive and in 11.9 % the points were falsely negative; the association was highly significant with \( \chi^2 \) (p < 0.001). In 37 of the 40 subjects there were more correct identifications than incorrect, which was rated significant by the Sign-test (p < 0.01).
2. The mean electrical conductivity and dermal tenderness at ear points related to specific areas of the body with present pain problems were both significantly higher with t test (p < 0.01).
3. Regarding the laterality for ear points relative to the side of a physical problem, the mean electrical conductance was significantly higher if the problem was ipsilateral (p < 0.01); the mean tenderness of ear points, in the case of unilateral problems, did not differ between the right and left ear.
4. There were no significant differences in either auricular conductance or auricular tenderness between recent and old pain problems. Recent pain problems were defined as having occurred within 6 months prior to the study; old problems as having occurred more than 6 months previously.
5. In 15 % of the subjects a localized region of white, flaky scaling of the auricular dermis could be found to be corresponding to the body parts where musculoskeletal pain was present. Oleson wrote on this subject, “although infrequently observed, abnormal morphological characteristics on the auricular surface were highly predictive of the presence of pathology in the corresponding area of the body.”

The interesting conclusions of Oleson’s article were that “this study also indicated that the auricular diagnosis technique is often sensitive to pathological problems of which the patient is only minimally aware. When some patients were told of their auricular diagnosis results, they suddenly remembered having a minor or old pain problem which they had forgotten to mention during the medical evaluation. Since these post-hoc results were derived after the ear diagnosis had been made, these instances were not included in any statistical analyses. Nonetheless, such observations do suggest that auricular diagnosis may be effectively employed as part of a general medical evaluation designed to reveal all organic aspects of a patient’s pain complaint. Since there are also ear points for abdominal and thoracic bodily organs, auricular diagnosis could also be utilized with standard diagnostic procedures for ana-
lyzing pathological conditions related to internal pain or referred pain.” [1]

Since then, Oleson’s research has become the reference study and has been cited in several articles on ear acupuncture. A recent paper however re-examined the possibility that auricular maps are reliable for chronic musculoskeletal pain disorders [2]. Fortunately, the authors had no intention of replicating Oleson’s study but only of proposing a different method for validating auricular diagnosis by using a 250 g algometer. The main shortcomings of this study were indeed the limited number of patients examined (only 25), the lack of importance given to the posterior surface of the ear which was not examined at all, and the adoption of an arbitrary somatotopic arrangement of the auricular zones not faithfully corresponding either to the French or to the Chinese map. For example, the knee was represented twice on 2 different areas roughly corresponding to the zones according to the two schools just mentioned, but the article fails to report which of the two the blind assessor came to consider as corresponding to a painful knee, or whether both corresponded.

In Oleson’s study, the 12 different auricular regions chosen for research were instead the somatotopic representations of the body according to the Chinese map. In my opinion, the concept of parallelism between a topographical area of the body and the corresponding somatotopic auricular area expressed by Oleson has to be considered innovative. Actually, in the diagnostic process we need to speak about areas, especially if we are learning, or teaching beginners to select the most effective points for treatment within each area. Especially Bourdiol [3] introduced the concept of somatotopic areas early, but the most interesting interpretation of the body’s representation on the auricle is probably that of Jean Bossy [4], former director at the Montpellier Institute of Anatomy and author of several books and articles on the neurophysiological basis of acupuncture. His representation of the homunculus on the auricle [5] is probably more realistic and useful for the practitioner than the well-proportioned foetus we see on the common drawings of the ear. As in the homunculus sensitivus and motorius of Penfield, the hand and the thumb have a large representation, as do the lips, nose, and jaws (Figure 2).

### Table 1

<table>
<thead>
<tr>
<th>Symptom</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Musculoskeletal</td>
<td>32.7</td>
</tr>
<tr>
<td>Psychological/psychiatric</td>
<td>22.5</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>14.7</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>6.8</td>
</tr>
<tr>
<td>Nervous system (central/peripheral)</td>
<td>4.6</td>
</tr>
<tr>
<td>Dermatological</td>
<td>4.6</td>
</tr>
<tr>
<td>Genitourinary</td>
<td>3.7</td>
</tr>
<tr>
<td>Ear–nose–throat</td>
<td>2.9</td>
</tr>
<tr>
<td>Endocrine &amp; metabolism</td>
<td>2.7</td>
</tr>
<tr>
<td>Teeth and TMJ</td>
<td>2.3</td>
</tr>
<tr>
<td>Other</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

**A new project for validating auricular diagnosis**

Starting from Oleson’s historical paper I tried to create a project for validating auricular diagnosis which could be acceptable and reproducible. I applied the following methodology: each new patient was invited to fill in a form with his old and recent symptoms and diseases in decreasing order of importance; the most
relevant were listed at the top, the less important at the bottom. The patient also was invited to write down type and number of surgical interventions, hospital admissions and injuries and furthermore to list medication taken regularly, especially analgesic and psychoactive drugs, and their time of intake. My assistant had the task of removing any diagnostic material such as X-rays or laboratory tests which could influence my diagnosis. The patient, seated, was invited to be silent for a while and not to give any information about his health problems. As specified in the former paragraph, the inspection was the first diagnostic method performed, followed in a random order by Pain Pressure Test (PPT) or Electric Skin Resistance Test (ESRT). PPT was performed using a commercially available pressure-probe of 250 g maximal pressure (Sedatelec) for identifying the most sensitive points. ESRT was performed using a commercially available device (Agiscop-Sedatelec) for which I declare the absence of any conflict of interest.

The device allows the measurement of at least 6 different levels of skin resistance, varying from 200 KΩ to 20 MΩ. A threshold of 1 MΩ, corresponding to position 4 of the knob, was maintained constantly throughout the whole validation process on 506 patients. From the empirical point of view, the choice of this threshold seemed the most convenient for the majority of the subjects examined allowing the identification of a sufficient number of points for diagnosis. Agiscop has a coaxial electrode, as do other devices such as Pointoselect (Schwa-medico), allowing a measurement of electric resistance according to a differential technique. The polarity (-) of the knob corresponds to a difference of ESR due to a lower resistance of the surrounding coaxial electrode with respect to the central electrode. This modality was chosen because the average number of points identified with the (-) polarity was 2.3 times greater than the (+) polarity; indeed this difference allowed a higher diagnostic success for the first modality. For each method I used different sheets of the Sectogram, transcribing all possible symptoms and diseases I thought to be related to the topography of skin alterations (SA) or to the location of the points identified with PPT and ESRT. My assistant afterwards compared my diagnosis with the complaints listed by the patient. He had the delicate task of working out the number of consistent symptoms, but was free to interpret them as best he could, also speaking to the patient. For example a ‘pain in the arm’ could be reinterpreted as a ‘painful shoulder’ or ‘cervical-brachial pain’; when the clinical condition was uncertain both terms could be retained. With mental disorders the different terms reported by the patient had to be harmonized. For example ‘tension’ or ‘irritation’ were evaluated as anxiety and ‘sadness’ or ‘melancholy’ were instead evaluated as depression.

1. Patients’ characteristics

From 2002–2007, I examined a total of 506 patients: 371 females (average age 48.1, SD 14.6, range 17–84) and 135 males (average age 46.5, SD 14.9, range 13–80). The total number of symptoms reported/identified in my population of patients was 5641 (females averaged 11.9 symptoms, males averaged 9.2 symptoms). The higher number of female patients attending my clinic is not unusual for therapists practising complementary techniques. Several factors could explain this phenom-
enon: in my opinion, it could be related to what today seems to be a stronger desire in females compared to males to preserve their health at best, or perhaps to search for alternative treatments in order to avoid drugs with pronounced side effects or which are feared to be potentially harmful. Another characteristic in the patient population I examined was the relatively high percentage aged > 60 (22.3 %). This factor is possibly due to the greater presence of musculoskeletal disorders in this phase of life. If indeed we consider the 5641 symptoms reported, the most common were symptoms related to the musculoskeletal system (32.7 %) followed by symptoms related to the psychological/psychiatric area (22.5 %). Table 1 reports further symptoms related to other organs and systems in order of decreasing importance (Table 1). It is possible, however, that every practitioner may find or treat varying types of symptoms in his patients according to his experience and interest in specific fields of medicine. Nevertheless, my impression is that for the majority of therapists, acupuncture for musculoskeletal pain is the most common application.

2. Results of the validation

The aim of my validation was to find an answer to the following questions:
1. Were the different diagnostic methods quantitatively equivalent in unveiling the patients’ problems?
2. Were the different methods equivalent in diagnosing recent and old problems?
3. In the case of musculoskeletal disorders, were the different methods equally effective in detecting the prevalent side of pain?

Regarding the first question, the three diagnostic methods used had different success rates for the identification of patients’ symptoms. Ranging in first place, we have inspection with 52.2 %, followed by PPT with 33.7 % and ESRT (–) with 33.2 %. Interestingly, if a symptom has been identified by at least one method there is a success rate of 78.6 % (Table 2 a). The significance of this is evident: the experienced practitioner who generally applies all the proposed methods acquires a better understanding of his patients’ conditions. This result is confirmed by the significantly higher diagnostic potentiality of the 3 methods together compared to the inspection alone (Table 2 b).

Table 2: Diagnostic success rates in % obtained in the identification of 5641 symptoms in 506 patients with 3 methods: inspection, PPT and ESRT (–) (a); comparison of the different methods with paired samples T-Test (b)

<table>
<thead>
<tr>
<th>Method</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspection</td>
<td>52.2 %</td>
</tr>
<tr>
<td>PPT</td>
<td>33.7 %</td>
</tr>
<tr>
<td>ESRT (–)</td>
<td>33.2 %</td>
</tr>
<tr>
<td>Three methods together</td>
<td>78.6 %</td>
</tr>
</tbody>
</table>

Table 3: Diagnostic success rates in % obtained in the identification of 570 symptoms, occurring in the prior 6 months, with 3 methods: inspection, PPT and ESRT (–) (a); comparison of the different methods with paired samples T-Test (b)

<table>
<thead>
<tr>
<th>Method</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspection</td>
<td>48.2 %</td>
</tr>
<tr>
<td>PPT</td>
<td>33.7 %</td>
</tr>
<tr>
<td>ESRT (–)</td>
<td>30.7 %</td>
</tr>
<tr>
<td>Three methods together</td>
<td>74.7 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Mean</th>
<th>Lower</th>
<th>Upper</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspection – PPT</td>
<td>14.6 %</td>
<td>9.1 %</td>
<td>20.0 %</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Inspection – ESRT (–)</td>
<td>17.5 %</td>
<td>11.8 %</td>
<td>23.3 %</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>PPT – ESRT (–)</td>
<td>3.0 %</td>
<td>-2.0 %</td>
<td>7.9 %</td>
<td>NS</td>
</tr>
<tr>
<td>Inspection – 3 methods</td>
<td>-26.5 %</td>
<td>-30.1 %</td>
<td>-22.9 %</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>
Regarding the second question, if the three methods adopted had different success rates in identifying recent and old problems, we applied the same categorization used by Oleson in his study. Recent problems, defined as having occurred in the past 6 months, had an average of 62 days; old problems, having occurred more than 6 months previously, had an average of 11.8 years.

The success rates in identifying these two categories of symptoms were very similar for all 3 diagnostic methods. It has to be stressed that the group of recent disorders scored only 11.2 % of the total; this is a further sign that my population of patients, asking for acupuncture to alleviate their problems, was composed of people suffering especially from chronic, recurrent ailments. I was surprised that inspection did not turn out to have the high importance in diagnosing chronic and old problems that I would have expected. Nevertheless, a better diagnostic success rate was found in both cases compared to PPT and ESRT. The latter however showed no significant difference either for recent or old problems (Tables 3 and 4).

Regarding the third question, in my blind examination of the patients I had the possibility of determining the side of pain according to three options (right, left and bilateral). In diagnosing musculoskeletal pain disorders, I obtained the following success rates for ipsilateral (right or left side) pain (inspection 51.7 %, PPT 25.3 %, ESRT (–) 14.6 %) (Table 5). If the pain was bilateral or without prevalence of side, the success rates were, as expected, higher (inspection 85.2 %, PPT 56.2 %, ESRT (–) 20.7 %) (Table 6). These results show that it is easier to identify a bilaterally occurring pain disorder on the auricle, especially with inspection and PPT.

3. Conclusions

The conclusions of my validation can be summarized as follows:

1. Inspection is an essential part of auricular diagnosis, alone or in combination with one or more detection techniques. Its superiority over the other methods confirms the importance Chinese authors attribute to this procedure apparently neglected in Western countries. The combination of as many diagnostic methods as possible permits the experienced physician to achieve a
relevant diagnostic versatility in suspecting health disorders of various origin in his patients.

2. Inspection is furthermore superior to PPT and ESRT in diagnosing either recent or old problems; however, there is no significant difference between the two methods. These findings coincide with the results of Oleson’s study, where the mean auricular conductivity and the mean auricular tenderness of the areas identified in the two groups with recent or old problems were not statistically different.

3. In the case of musculoskeletal pain of any origin, auricular examination seems to be more important in diagnosing a bilateral disorder than an ipsilateral one. Inspection, however, once again seems to be superior to PPT and ESRT in detecting both an ipsilateral or bilateral pain disorder. The reasons for the low success rate (especially with PPT and ESRT) in determining the side of pain may correlate to the auricular physiology which probably does not strictly separate the somatotopic representations of structures and functions of the human body. Nogier himself stated that, “a large number of various and repeated observations could not permit me to state a priori that a certain auricular zone could be active on the ipsilateral or contralateral side of the body. A series of thorough investigations indeed allowed me to ascertain that the same region could act either on one side or the other. By means of all researches I have done, I am now convinced that the confounding factor was due to an interaction between the symmetrical points of the two auricles. When we are going to stimulate point A on the right ear we stimulate at the same time point A’ on the left ear. This explains the crossed action of the auricular points: even if the stimulated point originally corresponds to the ipsilateral side of the body, the active point is in this case located symmetrically on the opposite ear.” [6]

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None

Conflict of interests
None

Acknowledgements
I would like to express my gratitude to all my patients and colleagues who throughout time have made this work possible. Special thanks go to my assistant Dr. med. Riccardo Mazzoni; to Marco De Vincenzi for his tireless processing of data; Andrea Giommi and Francesco Profili for their statistical expertise and Susan Seeley for her linguistic assistance.

References
Auricular Acupuncture for Anxiety in Health Care Volunteers: Randomized Crossover Study Comparing Real and Sham Needles

Giuseppe Gagliardi, MD,1,2 Mariarosa Meneghetti, MD,1,2 Francesco Ceccherelli, MD,2 Andrea Giommi, PhD,3 and Marco Romoli, MD4

ABSTRACT

Introduction: Several reports in the literature indicate that auricular acupuncture/acupressure is effective for reducing anxiety in the perioperative period, during ambulance transport, and before dental treatment.

Objective: The goal of this study was to assess the anxiolytic-sedative effect of ear acupuncture on health care volunteers, comparing the effect of real and sham needles in a randomized, single-blinded, crossover study.

Methods: Twenty health care volunteers (11 males, 9 females, ages 24–44, average 33.5 years) were enrolled and treated in a random order, twice 2 weeks apart, with real and sham needles. The needles were applied for 20 minutes and then removed. The anxiolytic effect was measured, before and after treatment, with a numeric rating scale (NRS) anxiety score and a State-Trait Anxiety Inventory (STAI-Y) State anxiety score. The sedative effect of acupuncture was scored with the Bispectral Index System (BIS) at baseline and during the treatment at 5, 10, 15, and 20 minutes.

Results: When comparing real and sham conditions at baseline, there were no differences in NRS, STAI-Y, and BIS values. A significantly higher reduction of anxiety was, however, observed when applying real needles, both for NRS (p < 0.01) and STAI-Y values (p < 0.005). When comparing real and sham conditions, the BIS value did not vary after 5 minutes, but, after 10, 15, and 20 minutes, a significant decrease in anxiety was observed during the real-needle application.

Conclusions: This study showed that real auricular, compared to sham auricular treatment, had a specific and measurable effect on state anxiety in health care volunteers. Further studies are needed for identifying the various zones of the auricle associated with anxiety.

Key Words: Auricular Acupuncture; Sham Acupuncture; Anxiety; Bispectral Index

INTRODUCTION

It is a common experience that acupuncture induces a relaxing and tranquilizing effect. The efficacy of acupuncture for treating anxiety and anxiety disorders was evaluated by Pilkington et al. in their systematic review.1 In a literature search without language restrictions, twelve controlled trials were located, of which 10 were randomized controlled trials (RCTs). Four RCTs were focused on acupuncture for generalized anxiety disorder (GAD) or anxiety neurosis, while six trials were focused on anxiety in the perioperative period. Reporting of the studies of perioperative

1 Intensive Care Unit, Ospedale S. Antonio ULSS 16, Padova, Italy.
2 Associazione Italiana Ricerca Aggiornamento Scientifico (AIRAS), Padova, Italy.
3 Department of Statistics, Informatics and Applications, University of Florence, Firenze, Italy.
4 Center for Integrative Medicine, University of Florence, Firenze, Italy.
anxiety was generally better, and the initial indications were that acupuncture—specifically auricular acupuncture—is more effective than acupuncture at sham points and may be as effective as drug therapy is in this situation. The conclusions were that the promising findings indicate that further research is warranted in the form of well-designed, adequately statistically powered studies.

Several articles have been published in the last 10 years about the possible application of auricular acupuncture/ acupressure for anxiety in prehospital transport settings; in patients, with acute hip fracture and with renal calculi before lithotripsy, during ambulance transport; and in patients before dental treatment. The first publications on this subject however go back to 2001 when Shu-Ming Wang, MD, of the department of Anesthesiology of Yale University, and colleagues, began to assess the effectiveness of auricular acupuncture for reducing anxiety in healthcare volunteers. In a randomized trial, he compared three treatment groups using only one point each, respectively, the Shenmen point; the Relaxation point (located at the superior lateral wall of the triangular fossa); and a sham point at the tip of the concha, reported “to achieve homeostasis of the Stomach meridian.” In Wang et al.’s first article, it is noted that the subjects of the Relaxation group showed a significant reduction of anxiety scored with the State-Trait Anxiety Inventory (STAI-Y) 30 minutes, and 24 and 48 hours after acupuncture. In a second article, describing research that assessed the efficacy of auricular acupuncture for reducing preoperative anxiety, patients were randomized again to three intervention groups, but each group received acupuncture treatment on three different points. The groups were a Relaxation group (using Relaxation, Tranquilizer and Master Cerebral Points); a Traditional Chinese Medicine group (using Kidney, Heart and Shenmen points); and a control group (using three points that were not supposed to have an effect on anxiety [Fig. 1]). Each participant received three ear acupuncture press needles on the nondominant side (the opposite side of the patient’s dominant hand) of the external ear for 30 minutes without any stimulation. Anxiety was scored with the STA1-Y at baseline and reassessed 30 minutes after the intervention. Patients in the Relaxation group were significantly less anxious, compared with patients in the control group (p < 0.01).8

Inspired by Wang’s studies the current authors decided to perform a crossover study on healthy volunteers working in a healthcare area. The aim of the current study was to assess the efficacy of individualized ear acupuncture points, comparing the effect of real and sham needles in a randomized, single-blinded, crossover study.

**MATERIALS AND METHODS**

The institutional review board of the Hospital S. Antonio granted full approval for this study prior to its commencement. Twenty health care volunteers of the Hospital S. Antonio were enrolled (11 males, 9 females; ages 24–44, mean age of 33.5 years). On the morning of examination they were invited, without any previous notice and explanation, to lie down in a silent room for monitoring heart frequency and finger-pulse oximetry for 10 minutes. Afterward, the volunteers were informed that their auricles would be examined twice, at 2-week intervals, for mapping the auricular points that regulate the autonomous nervous system. The method applied for identifying these points was the Pain Pressure Test, using an algometer of 250 gr of maximal pressure, for detecting the most sensitive points to pressure. All identified points were marked with non-permanent ink, and their locations were transcribed on Romoli’s Sectogram, which is a validated system for a more correct and reliable transcription of points (Fig. 2A and

![FIG. 1. The three sets of points stimulated by Shu-Ming Wang, MD, in his randomized controlled trial for reducing preoperative anxiety (image used with permission). 1 = Relaxation; 2 = Tranquilizer point; 3 = Master Cerebral; 4 = Shenmen; 5 = Kidney; 6 = Heart. Squares indicate points for the Relaxation group, triangles indicate points for the Traditional Chinese Medicine group, and circles indicate points for the sham control group.](image-url)
FIG. 2. (A) The points identified in 20 volunteers and treated with real needles. (B) The points identified in 20 volunteers and treated with sham needles.
The volunteers were asked for consent to be treated both times on these points with semipermanent needles. All subjects gave their permission and were randomly treated in crossover with real or sham needles from aDONGBANG Acuprime® set. The real needle has a diameter of 0.22 and a length of 1.5 mm. The sham needle, introduced by Jongbae J. Park, MD, looks apparently like a real needle but does not have any tip\textsuperscript{11} (Fig. 3). The needles were left in situ for 20 minutes and removed. The blood pressure of each subject was taken before and after treatment; the sedative action of auricular acupuncture was measured during the whole period of 20 minutes, using the forehead electrodes of the Bispectral Index System (BIS; Fig. 4). The BIS uses processed electroencephalograph (EEG) information and measures the depth of sedation from 0 (awake) to 100 (awake, memory intact). Values ranging from 40 to 60 correspond, for example, to a "recommended range for general anesthesia"; values from 60 to 90 correspond to a "recommended range for sedation."\textsuperscript{12}

The outcome measures of the auricular stimulation were the following: Numeric rating scale (NRS) for anxiety, from 0 = no anxiety to 10 = worst anxiety; STAI-Y State anxiety value; and BIS value. The first two parameters were scored before and after acupuncture, the BIS value was scored at baseline and again at 5, 10, 15, and 20 minutes. Several researchers have applied the BIS when investigating the sedative effect of acupuncture/acupressure on the Yintang acupuncture point in healthy volunteers\textsuperscript{13,14} and in patients with preoperative anxiety.\textsuperscript{15,16} A recent Chinese article however verified the sedative action of transcutaneous electrical stimulation of Shenmen (TF 4) during caesarian section.\textsuperscript{17} For the statistical analysis in the current study, a t-test for paired data (α = 0.05) was used for comparing the differences in NRS anxiety score and STAI-Y value, before and after acupuncture, in the real-needle and sham-needle groups. For the BIS test, the basal value and those at 5, 10, 15, and 20 minutes were also compared with a t-test for paired data.

RESULTS

With respect to the distribution of tender points on both auricles some areas were found with a relatively higher

| Table 1. Mean and SD of NRS, STAI-Y and BIS Values at Basal and Successive Times |
|-------------------------------|----------------|----------------|----------------|----------------|
| Instrument | Timepoint | Real needle Mean | Real needle SD | Sham needle Mean | Sham needle SD |
| NRS | Basal | 3.1 | 0.76 | 3.0 | 0.73 |
| After | 1.7 | 0.75 | 2.3 | 0.86 |
| STAI-Y | Basal | 45.5 | 3.38 | 45.1 | 3.80 |
| After | 41.0 | 3.15 | 43.6 | 2.01 |
| BIS | Basal | 97.4 | 1.60 | 96.8 | 1.54 |
| 5 min | 95.6 | 2.98 | 95.9 | 3.45 |
| 10 min | 93.0 | 5.45 | 95.1 | 2.77 |
| 15 min | 91.3 | 8.14 | 94.2 | 4.37 |
| 20 min | 90.6 | 5.13 | 93.7 | 3.82 |

SD, standard deviation, NRS, numeric rating scale; STAI-Y, State-Trait Anxiety Inventory; BIS, Bispectral Index System, min, minutes.
concentration of points in both groups on some auricular areas, such as the tragus, the intertragic notch, the anterior part of the earlobe, the fossa triangularis, etc. There were no differences between the groups in the distribution of points noted on the various sectors of the Sectogram. The basal values of NRS, STAI-Y, and BIS in each subject, using real or sham needles, were actually not different, indicating, therefore, that a balanced and reliable crossover comparison was possible (Table 1). It should be noted that all of the subjects were not aware of which treatment they received or that they were participating in this study in the control (sham needles) and in treatment (real needles) group at different times. When comparing the effects of real and sham needles, it was noted that there was a significantly higher reduction of anxiety in the real-needles group, both for NRS anxiety score ($p < 0.01$) and STAI-Y State anxiety score ($p < 0.005$; Table 2; Figs. 5 and 6). BIS values did not vary after 5 minutes, but at 10, 15, and 20 minutes they were significantly reduced during the real-needles application (Table 2; Fig. 7).

DISCUSSION

As recently reported in the literature by several authors, auricular acupuncture seems to be effective for reducing temporary anxiety in preoperative conditions, prehospital transport settings, or in a waiting room before dental treatment. Even a noninvasive, however, unexpected, investigation such as pulse finger oximetry associated with a heart rate measure may induce temporary anxiety in health care volunteers; this anxiety may respond to specific auricular stimulation. The literature has often pointed out that acupuncture seems to have a powerful placebo effect, which is correlated in a complex manner to specific and nonspecific effects. What is interesting in this study is, in the current authors’ opinion, is that this study documented a specific anxiolytic and sedative effect when applying individualized
auricular acupuncture. There are, however, some open questions regarding the number and the location of points identified in each subject. Which points produced the most pronounced effect? Did these points act in the same way in all of the subjects? Which combination of points should be selected to give an optimal synergic effect? The areas with higher concentrations of points seem, however, to overlap with those found and treated by different researchers. Further studies are needed to identify the various zones of the auricle associated with anxiety.

CONCLUSIONS

Ear acupuncture/acupressure has recently raised the interest of acupuncturists for treating perioperational anxiety and GAD. This study showed that real auricular acupuncture, compared to sham auricular treatment, has a specific and measurable effect on state anxiety. It would be interesting and profitable to extend this research, in the form of well-designed and adequately powered studies, also to other potentially responsive disorders, such as depression and insomnia, and to the prevention of panic attacks.

DISCLOSURE STATEMENT

No competing financial interests exist.

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Address correspondence to:
Marco Romoli, MD
Via Sprone 1/4,
59100-Prato
Italy

E-mail: markro@tin.it
Auriculotherapy for Persisting Postoperative Pain Caused by Total Knee Replacement

Marco Romoli, MD,1,2 Chrissanthi Avgerinos, MD,3 Luigi Baratto, MD,3 and Andrea Giommi, PhD4

ABSTRACT

Introduction: Total knee replacement (TKR) is a common procedure that entails severe postsurgical trauma, prolonged hospitalization, and impaired patient rehabilitation, especially in patients who are elderly. Among the nonpharmacologic methods used with TKR, auriculotherapy/ear acupuncture (AEA) has recently shown a favorable effect on perioperative/postoperative pain and disability in patients who have undergone TKR.

Objective: The primary aim of this study was to examine the adjuvant effects of one session of auricular acupuncture on persisting pain and disability in patients hospitalized for TKR postoperative rehabilitation. The secondary aim was to propose a simplified diagnostic method for selecting the most effective points to treat in each patient.

Materials and Methods: In 17 patients (14 females and 3 males; mean age 75.2 years) hospitalized for postoperative TKR rehabilitation, pain level and time for sit-to-stand were measured before, 30 minutes after, and 6 hours after one session of auricular acupuncture. In each patient, an electric skin resistance test (ESRT) was performed on both auricles, followed by a pain pressure test (PPT) for identifying the most sensitive points. A second PPT was consecutively performed on the previously located auricular points and only those ipsilateral to the operated knee were selected for treatment.

Results: All 17 patients reported having lower level of pain after the AEA treatment, and this effect was still maintained after 6 hours. A better performance in the sit-to-stand test was observed after 6 hours following treatment.

Conclusions: The auricular points, which were effective for reducing pain and disability, were spread out over a broad area of the upper external ear, which overlaps both the French and Chinese somatotopic auricular representations of the knee joint.

Key Words: Total Knee Replacement, Postoperative Pain, Auricular Acupuncture Diagnosis, Auriculotherapy

INTRODUCTION

Total knee replacement (TKR) is a common surgical procedure that has only low levels of mortality and entails few surgical complications; however, there may be severe postsurgical trauma, prolonged hospitalization, and impaired patient rehabilitation especially in elderly patients. More than 50% of patients undergoing surgery report postoperative pain as a major concern. Moreover, consequences of uncontrolled pain can lead to myocardial ischemia and infarctions, pulmonary infections, paralytic ileus, urinary retention, thromboembolisms, impaired immune functions,
A multimodal approach to pain seems the best way to achieve maximal control of postoperative pain after TKR. In the conventional medical literature, a combination of different drugs are recommended during the preoperative period (nonsteroidal anti-inflammatory drugs [NSAIDS], cyclooxygenase [COX]–2 inhibitors, anticonvulsants), the intraoperative period (opioids, local anesthetics), and the postoperative period (opioids, NSAIDS, COX-2 inhibitors, α2-agonists, N-methyl-d-aspartate [NMDA] antagonists, anticonvulsants, and such centrally acting analgesics as acetaminophen). Among the nonpharmacologic techniques, auriculotherapy/ear acupuncture (AEA) seems to be an interesting method for reducing perioperative/postoperative pain and disability in patients undergoing TKR. A meta-analysis of Asher et al. included 17 studies encompassing a wide variety of AEA interventions, such as acupuncture needles, indwelling semipermanent needles, electrical and laser stimulation, acupressure, etc. In studies on pain relief after ambulatory knee surgery arthroscopy and surgery, Usichenko et al. used disposable indwelling steel auricular acupuncture needles (0.22-mm diameter × 1.5-mm length), which were inserted before surgery and retained in situ until the following morning. In these studies, the AEA group had treatment on three points ipsilateral to the surgery site: Knee joint; Shenmen; and Lung. Three nonacupuncture points of the helix, ipsilateral to the site of surgery, were used for the control procedure. Both the acupuncture points and the nonacupuncture points were located more precisely with an electronic device for detecting zones of low skin resistance. Two articles outlined the possibility of managing postoperative pain in patients with TKR by applying auricular acupressure on some points of the current standardized Chinese map. Chang et al. applied magnetic beads for 3 days on the areas for Shenmen (TF 4) and Subcortex (AT 4), pressing the acupoints with the fingertips for 3 minutes per point, 3 times per day (at 9 AM, 1 PM, and 5 PM). Vaccaria (Vaccaria spp.) seeds were placed by He et al. at four standardized Chinese auricular points: Knee joint (AH 4), Shenmen (TF 4), Subcortex (AT4), Sympathesis (AH 6, at the junction of the terminal part of the inferior antihelix with the inner border of the helix). See Fig. 1 for these points. The points were stimulated ipsilaterally to the site of surgery, and their efficacy was compared to four nonacupuncture points on the ipsilateral helix. Acupressure was applied by repeatedly pressing the acupoints with the fingertips for 3 minutes per point, four times per day; this treatment ended 7 days after surgery. Patients in the treatment group reported lower pain-intensity scores and used less analgesic medication via patient-controlled analgesia (PCA) than the patients in the control group.

The primary purpose of this study was to examine the adjuvant effects of one session of auricular acupuncture on persisting pain and disability in patients hospitalized for total knee replacement (TKR) postoperative rehabilitation.

The secondary aim was to propose a simplified diagnostic method for selecting the most effective points to treat in each patient.

MATERIALS AND METHODS

A consecutive group of 17 patients who had undergone TKR and who had been admitted to La Colletta Hospital, in Arenzano, Genova, Italy, for postoperative rehabilitation, were also treated with one session of ear acupuncture. The study was approved by the institutional ethical committee, and the patients gave their informed consent the day before to undergo the procedure, agreeing in particular to postpone intake of the prescribed drug (paracetamol/NSAIDS) for 6 hours on the next morning. A washout of analgesic drugs during at least 6–8 hours was necessary, according to Romoli, to prevent a false-negative diagnosis and to identify correctly the specific auricular points associated with the investigated pain syndrome.

Exclusion criteria for the current study were as follows: mono-compartmental knee replacement; any neurologic...
disorder that could interfere with the proposed performance test; auricular acupuncture in the past; and a numeric rating scale (NRS) pain score of <4 on the morning of treatment. In a consecutive group of 25 patients, 8 were excluded (2 with hemiparesis, 1 with diabetic neuropathy, and 5 on the morning of treatment because they had a pain level of <4 in a seated position). Of the remaining 17 patients (14 females and 3 males; average age years 75.7; standard deviation [SD]: 4.6; range 65–83) all were included and treated between the eighth and twenty-eighth day after intervention (average 16.6 days; SD 5.6). On the morning of the treatment session, the patients were informed again about the procedure and were provided with informed consent forms to complete. Each patient sat in a standard chair without armrests. The first physician (C.A.) measured each patient’s pain level with an NRS (from 0 = no pain to 10 = worst pain) in sitting and standing positions. The average time for sit-to-stand was scored on three consecutive standing movements. The same movement tests were repeated after the auricular acupuncture session and again 6 hours later. Auricular diagnosis was performed by a second physician (M.R.) with a simplified method for selecting the most effective points for treatment in each patient. As several areas of the auricle may be associated with different disorders and dysfunctions in an elderly patient, auricular diagnosis in these patients was restrained to the upper and lower crus of the antihelix and the subtended triangular fossa. This region of the upper auricle includes ear points where the French and the Chinese schools of auriculotherapy somatotopically represent the knee (Fig. 2). Both auricles were examined with an electrical skin resistance test (ESRT) and a pressure pain test (PPT). ESRT was performed with the commercially available device Agiscop D Point Detector Sedatelec (France) for identifying the points with lower resistance, choosing the threshold value of 1 mega ohm (knob 4). PPT was performed with the blue pressure-probe of the Sedatelec, exerting a 250-g. maximal pressure for identifying the most-sensitive auricular points. A second PPT was consecutively performed on both the previously identified tender points and the electrically detected points. Only the points maintaining a tenderness during the second test were marked with ink. The selected points were transcribed on the Sectogram of Romoli, which is a graphic tool enabling a more-correct transcription of the points (Fig. 3). Only the points located on the ear ipsilateral to the operated knee were treated with acupuncture points. Acupuncture was performed by the third physician (L.B.) using Australian needles (Hwato; 20-mm length × 0.25-mm diameter) and left in place for 20 minutes without further stimulation.

RESULTS

Nine patients of 17 included in the study were operated on the left side and 8 on the right side. On the morning of treatment (T0), the patients reported a pain level in the sitting position; this level varied from 4.5 to 10 (mean average of 5.9; SD 1.8). The average sit-to-stand time at T0, on three consecutive movements, varied from 2 to 12.6 seconds (mean average of 4.7; SD 2.5; Table 1). After auricular acupuncture (T1) and 6 hours later after the AEA was completed (T2), reported pain levels decreased significantly both in the sitting and standing positions (Table 2A and B). When transitioning from T1 to T2, there was no significant variation in standing position results (Table 2B). The average sit-to-stand time did not reach significance at T1 (p=0.09) but decreased significantly at T2 (p<0.005; Table 3).
Auricular diagnosis and ESRT identified on both auricles yielded a total of 10 points on average with lower electrical resistance in the tested area of the upper auricle; 5.7 of the points were located on the ipsilateral ear and 4.3 of the points were located on the contralateral ear. PPT identified on both auricles, at the first test, 10.8 sensitive points on average; 7.5 of the points were located on the ipsilateral ear and 3.3 of the points were located on the contralateral ear. The second consecutive PPT, retained for treatment only, yielded 4.5 points on average on the ipsilateral ear (2.7 on the antero-lateral and 1.8 on the postero-medial surface), showing a reduction of 41.5%, compared to the first PPT. The selected points for treatment were spread out over a wide area, larger than commonly expected, but corresponding, however, both to the Chinese and French somatotopic representations of the knee.

**DISCUSSION**

As already reported by the literature AEA seems to have a positive effect on reducing knee pain after arthroscopy and surgery. In the current study, a possible adjuvant effect of auricular acupuncture was observed in elderly patients with a tendency to have prolonged hospitalizations. Both pain levels (after treatment) and the sit-to-stand times (after surgery) were significantly reduced.

**TABLE 1. MEAN AND SD OF NRS AND SIT-TO-STAND TIME AT T0, T1 AND T2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRS in sitting position T0</td>
<td>5.88</td>
<td>1.76</td>
</tr>
<tr>
<td>NRS in sitting position T1</td>
<td>3.71</td>
<td>2.80</td>
</tr>
<tr>
<td>NRS in sitting position T2</td>
<td>3.65</td>
<td>2.89</td>
</tr>
<tr>
<td>NRS in standing position T0</td>
<td>6.15</td>
<td>2.05</td>
</tr>
<tr>
<td>NRS in standing position T1</td>
<td>4.76</td>
<td>2.62</td>
</tr>
<tr>
<td>NRS in standing position T2</td>
<td>3.97</td>
<td>2.80</td>
</tr>
<tr>
<td>Sit-to-stand time T0</td>
<td>4.71</td>
<td>2.55</td>
</tr>
<tr>
<td>Sit-to-stand time T1</td>
<td>4.14</td>
<td>1.94</td>
</tr>
<tr>
<td>Sit-to-stand time T2</td>
<td>3.30</td>
<td>0.88</td>
</tr>
</tbody>
</table>

SD, standard deviation; NRS, numeric rating scale; T, time.

**TABLE 2. PAIRED T-TEST FOR DIFFERENCES BETWEEN AVERAGE PAIN SCORES IN TWO POSITIONS**

<table>
<thead>
<tr>
<th>Paired comparisons</th>
<th>T</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0–T1</td>
<td>3.92</td>
<td>&lt; 0.005</td>
</tr>
<tr>
<td>T0–T2</td>
<td>4.25</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>T1–T2</td>
<td>2.37</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>

**TABLE 3. PAIRED T-TEST FOR DIFFERENCES BETWEEN AVERAGE TIME (SECONDS) OF 3 CONSECUTIVE TESTS IN THE SIT-TO-STAND PERFORMANCE AT T0–T1, T0–T2, AND T1–T2 INTERVALS**

<table>
<thead>
<tr>
<th>Paired comparisons</th>
<th>T</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0–T1</td>
<td>1.34</td>
<td>NS</td>
</tr>
<tr>
<td>T0–T2</td>
<td>3.18</td>
<td>&lt; 0.005</td>
</tr>
<tr>
<td>T1–T2</td>
<td>2.34</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>

T, time; NS, not significant.

**FIG. 3.** Distribution of treated points in 17 consecutive patients with chronic postoperative pain related to total knee replacement (black dots on the lateral surface; clear circles on the medial surface).
6 hours) were reduced, indicating therefore the possibility to include this kind of treatment in a specific rehabilitation program for this category of patients. Maintaining an evidence-based approach, this pilot study should be followed in the future by a randomized controlled trial that would compare usual rehabilitation for TKR with the same program associated with auricular acupuncture. One of the limits of this present study was not to have scored in the following hours, at least up to 24 hours, variation of the abovementioned parameters. The current authors were actually obliged, for ethical reasons, not to withdraw analgesic drugs from the patients for longer than 6 hours.

With respect to the applied methodology, the following items could be explored:

1. ESRT was performed first, before PPT, because the repetitive mechanical pressure applied by the algometer can, in some cases, cause scraping of the skin, consequently inducing a local higher permeability to an electric current.

2. PPT was applied twice consecutively, and the second test reduced significantly the number of tender points. However, it is possible that PPT applied a third time would have reduced the number of tender points even more. In the current authors’ opinion, this method should be used systematically by the acupuncturist to raise the “threshold” of tenderness of each point, thus allowing identification of the most specific and appropriate points for treatment in different patients who have the same pain syndrome.

3. Auricular diagnosis was performed on only a limited part of the ear, which included the somatotopic, auriculotherapy representation of anatomical structures such as the hip, knee, foot, gluteus, thoracic-lumbar-sacral spine, etc. ESRT and PPT were applied on the antero-lateral surface and also on the posterior-medial surface of the outer ear of each patient, taking into account the possibility of identifying on this surface the representation of the posterior part of the knee. In fact, 40% of the treated points were located on the posterior-medial surface of the examined area of the auricle. It has to be remarked that only Western authors have proposed points on the posterior-medial surface of the ear for treating knee pain.

4. The selected points for treatment were marked with nonpermanent ink on the right and left ears, but only those points located on the ear ipsilateral to the operated side were treated with acupuncture. The purpose of this ipsilateral stimulation, in agreement with the researchers cited in the introduction to this article, was to apply acupuncture only for the operated knee and to measure the effect of this intervention.

One important issue of this study concerns the dimensions of the treated area, which seems to be larger than commonly accepted by acupuncturists treating painful knees. There are two concepts that are important to consider regarding the size of these dimensions. First, a severe surgical trauma, such as TKR involving an important joint such as the knee, produces, in the current authors’ opinion, a marked reflex activation (with reduction of electrical resistance and sensitization) of an auricular area that cannot be expected to have small dimensions. Second, the large identified area tends to overlap with the double representation of the knee according to both the French and the Chinese schools of auricular acupuncture.

The current authors’ hypothesis is that an important joint such as the knee, which is essential for motion and that contributes greatly to postural stability in humans, probably has a much larger representation on the ear as previously supposed. In the current authors’ opinion, therefore, the somatotopic representation of the body on the auricle should be imagined more as homunculuslike image than as a proportioned fetuslike image. In this nondogmatic approach, a functionally more important or richly innervated structure...
of the body tends to have a larger representation than others that are functionally less important or that have less-developed innervation. The possibility that the knee area actually could include the double representation of the French and Chinese schools, was researched also by Maria Caterina Fresi, MD, who performed a study on patients with knee and ankle pain caused by bruises or sprains. She examined 34 patients with knee pain caused by injuries, respectively, of the lateral capsule-ligament complex (14 patients) or of the medial complex (20 patients). In the first group, the pain syndrome evoked a sensitization of an extended oval area covering the Chinese hip and knee areas, whereas, in the second group, the sensitized area was rather rounded and corresponded to the French thigh and knee areas (areas 1 and 2 of Fig. 4). A similar topographic observation was made on 15 patients with ankle pain caused by injuries, respectively of the capsule-ligament complex of the malleolus lateralis (8 patients), or of the complex of the malleolus medialis (7 patients). In the first group, the sensitized area corresponded to the Chinese ankle and toe/heel areas, whereas, in the second group, the sensitized area corresponded to the French foot areas (areas 3 and 4 of Fig. 4).8

CONCLUSIONS

The points identified with ESRT and double PPT may be effective for reducing pain and disability in elderly people with prolonged hospitalizations and persistent postoperative pain after TKR. These points are spread out on an area that tends to overlap with the representations of the knee joint according to French and Chinese researchers. A larger and more comprehensive study is warranted to explore the implications of the current study further.

DISCLOSURE STATEMENT

No competing financial interests exist.

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Address correspondence to:
Marco Romoli, MD
Via Sprone 1/4,
59100-Prato
Italy
E-mail: markro@tin.it