Evidence-based TMJ Surgery 2013

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‘evidence-based’ practice?

- the integration of best research evidence with clinical expertise and patient values
evidence-based practice

-best research evidence

Clinically relevant research often from basic science

*but* especially from **patient centred clinical research**
Randomised Controlled Trial
Cohort study
Case-control study
Cross-sectional survey
Case-series/report
Randomised Controlled Trial
Cohort study
Case-control study
Cross-sectional survey
Case-series/report

STRONG EVIDENCE
WEAK EVIDENCE
Randomised Controlled Trial

participants

inclusion/exclusion criteria

randomisation

Arthroscopy

outcome

INTERINCISAL OPENING

Arthrocentesis

outcome

INTERINCISAL OPENING
Temporomandibular Joint Disorders

• A **clinical term** to describe the musculoskeletal disorders affecting the temporomandibular joints (TMJs) and their associated musculature

• A **collective term** which represents a diverse group of pathologies involving the TMJ, the muscles of mastication, or both

• **Pain** is the defining feature in TMD and the primary reason for seeking care. TMD also may involve **joint noises and/or restricted jaw function**
Which intervention is best for each TMD?

**Acute**
i informed reassurance, jaw rest, thermal application, soft diet, analgesics

**Chronic**
physical therapy, occlusal, pharmacological, alternative medicine psychological, behavioural, arthrocentesis, arthroscopy, arthroscopic anterolateral capsular release, disc repositioning, disc replacement, discectomy, condylectomy, joint reconstruction
Which intervention is best for each TMD?

Literature often not clear because:

More than one intervention may be used at a time

Or

Intervention may be targeted at heterogenous groups eg myofascial pain and disc displacement with reduction
Nomenclature and classification for TMD

Research Diagnostic Criteria (RDC) for TMDs proposed by Dworkin and LeResche 1992

- TMD (Muscle disorders)
- TMD (Disc displacements)
- TMD (Arthralgia, arthritis, arthrosis)

and developed by others including Boudewijn Stegenga 2010
Clinical trials for TMD

Compare one intervention with one other or no intervention

Ensure clear classification of what type of TMD the trial is investigating

- doesn't have to be RDC/TMD but has to use some validated and published diagnostic criteria
Systematic review

- best summary of evidence

A review of all the literature on a particular topic, which has been systematically identified, appraised and summarised giving a summary answer.
Cochrane Collaboration

- preparation and dissemination of systematic reviews
Cochrane Library www.cochrane.org
1. Stabilisation splint therapy for TMD 2009
2. Occlusal adjustment for treating and preventing TMD 2009
3. Physical therapy for the management of patients with TMD and related pain 2009
4. Hyaluronate for TMD 2009
5. Arthrocentesis and lavage for treating TMD 2009
6. Orthodontics for treating TMD 2010
7. Pharmacological interventions for pain in patients with TMD 2010
8. Interventions for myogenous TMD patients 2010
9. Arthroscopy for TMD 2011
10. Interventions for the management of TMJ osteoarthritis 2012
Interventions for the management of temporomandibular joint osteoarthritis

Only 3 RCTs included in review
- pooling of data in a meta-analysis was not possible due to wide clinical diversity between the studies

Reports indicate:

Intra-articular injections of sodium hyaluronate *versus* corticosteroid
• Similar effectiveness but hyaluronate better for pain at 6 months

Diclofenac sodium *versus* occlusal splints
• Equivalent pain reduction and complications slightly less with diclofenac

Glucosamine *versus* ibuprofen
• Similar effectiveness for pain, discomfort and jaw movement
Interventions for the management of temporomandibular joint osteoarthritis

In view of the paucity of high level evidence for the effectiveness of interventions, parallel group RCTs which include participants with a clear diagnosis of TMJ OA should be encouraged

…and especially studies evaluating some of the possible surgical interventions
Arthroscopy for temporomandibular disorders

7 randomized controlled trials (n = 349)

Arthroscopic surgery versus to open surgery

Pain at 12 months in 3 studies, was better after open surgery (SMD = 0.45; 95% CI 0.01 to 0.89, P = 0.05)

Mandibular function after 12 months in 2 studies, no difference (MD = 1.58; 95% CI -0.78 to 3.94, P=0.19)

Maximum interincisal opening after 12 months in 2 studies, no differences (odds ratio (OR) = 1.00; 95% CI 0.45 to 2.21, P = 1.00)
Arthroscopy for temporomandibular disorders

Arthroscopy versus arthrocentesis

Pain at 12 months in 2 studies, no difference (MD) = 1.10; 95% CI -1.46 to 1.66, P = 0.90)

Maximum interincisal opening after 12 months, better after arthroscopy (MD) = 5.28; 95% CI 3.46 to 7.10, P < 0.0001)
Arthroscopy for temporomandibular disorders

Arthroscopy *versus* nonsurgical treatment

Pain at 6 months in 2 studies, no difference (SMD = 0.004; 95% CI -0.46 to 0.55, P = 0.86)
Arthroscopy for temporomandibular disorders

Authors’ conclusions

Both arthroscopy and nonsurgical treatments reduced pain after 6 months. When compared with arthroscopy, open surgery was more effective at reducing pain after 12 months. Nevertheless, there were no differences in mandibular functionality or in other outcomes in clinical evaluations. Arthroscopy led to greater improvement in maximum interincisal opening after 12 months than arthrocentesis; however, there was no difference in pain.

All studies were either at high or unclear risk of bias.
BIAS

Cochrane Systematic Review

Data collection and analysis

• Quality assessment
  – Random sequence generation (selection bias)
  – Allocation concealment (selection bias)
  – Blinding (performance and detection bias)
  – Incomplete outcome data (attrition bias)
  – Selective reporting (reporting bias)
  – Completeness of follow-up
• Authors contacted for any missing information
• Data independently extracted in duplicate
Search strategy

Cochrane Oral Health Group’s Trial Register
Cochrane Central Register of Controlled Trials (CENTRAL)
MEDLINE
EMBASE
Handsearched dental journals
Personal references

Any language
# TMD systematic reviews

<table>
<thead>
<tr>
<th>Problem</th>
<th>Intervention</th>
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<tbody>
<tr>
<td><strong>TMD (Muscle disorders)</strong></td>
<td></td>
</tr>
<tr>
<td>· Myofascial pain</td>
<td>Pharmacological</td>
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<tr>
<td>· Myofascial pain with limited opening</td>
<td>Physical therapy</td>
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<td>Occlusal treatments</td>
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<td></td>
<td>Alternative medicine</td>
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<td>Behavioural</td>
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<td><strong>TMD (Disc displacements)</strong></td>
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<tr>
<td>· Disc Displacement with reduction</td>
<td>Pharmacological</td>
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<tr>
<td>· Disc Displacement without reduction, with</td>
<td>Physical therapy</td>
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<tr>
<td>limited opening</td>
<td>Occlusal treatments</td>
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<tr>
<td>· Disc Displacement without reduction,</td>
<td>Alternative medicine</td>
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<tr>
<td>without limited opening</td>
<td>Surgical</td>
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<tr>
<td>· Arthralgia</td>
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TMD systematic reviews

• Subgroups

Multifactorial aetiology and complexity of confounding factors that may influence the onset, perpetuation and progression of the condition genetic, endocrine, neurological, medical co-morbidities, psychosocial and behavioural factors

- perhaps too complicated and better to produce clear outcomes for broad groups that can be adapted by individual clinician for the patients individual needs
The Cochrane Collaboration
The Cochrane Collaboration

- International network of people from over 100 countries
- Prepare, update, and promote the accessibility of Cochrane Reviews
- Help healthcare providers, policy-makers, patients, their advocates and carers, make well-informed decisions about health care

- over 5,000 Reviews so far, published online in the Cochrane Database of Systematic Reviews, part of The Cochrane Library
The Cochrane Collaboration

Each horizontal line represents the results of one trial.

Vertical line indicates the position around which the horizontal lines would cluster if the two treatments compared in the trials had similar effects; if a horizontal line touches the vertical line, it means that that particular trial found no clear difference between the treatments.

Diamond represents their combined results:
- left of the line indicates treatment is beneficial
- right of the line indicates treatment did more harm than good
The Cochrane Collaboration

RCTs of corticosteroid given to women about to give birth too early

The first RCTs reported in 1972

Systematic review of trials published in 1989 indicates strongly that corticosteroids reduce the risk of babies dying from the complications of immaturity.

- Treatment reduces the odds of the babies dying from the complications of immaturity by 30% - 50%

- Most obstetricians had not realised that the treatment was so effective and tens of thousands of premature babies had died unnecessarily
Issues in TMD treatments

Need agreement on diagnosis
Need agreement of interventions appropriate for the condition
  Sensible comparison of interventions
Need agreement on outcome measures
  Priority studies needed?
Summary

Scientific evidence is growing
-but need more trials to demonstrate efficacy

Need systematic reviews to demonstrate strength of evidence hidden in literature
Summary

Evidence-based TMJ management modalities

Need clinical skills and understanding of patient’s values and preferences for optimal practice and not just knowledge of data.
Thank you!

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