A systematic evaluation of the therapeutic effectiveness of sacroiliac joint interventions

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CRD summary
The authors concluded that evidence was fair in favour of cooled radiofrequency neurotomy and limited/poor for intra-articular or periarticular steroid/botulin toxin injections, pulsed radiofrequency and conventional radiofrequency neurotomy for chronic low back and lower extremity pain. These conclusions reflect the limited evidence presented and seem likely to be reliable.

Authors' objectives
To evaluate the effects of sacroiliac joint interventions in the management of patients with chronic low back and lower extremity pain.

Searching
PubMed, EMBASE, The Cochrane Library, the United States National Guideline Clearinghouse (www.guideline.gov) and ClinicalTrials.gov were searched from 1966 to December 2011. The reference lists of previous systematic reviews were also searched.

Study selection
Eligible for inclusion were randomised controlled trials (RCTs); non-randomised observational studies, case reports and reviews (for adverse effects) related to sacroiliac joint injections carried out appropriately under fluoroscopic or computed tomography guidance or magnetic resonance imaging. Study duration had to be at least one month. Eligible patients were adults (at least 18 years old) with chronic low back and/or lower extremity pain which had lasted for at least three months and for whom other therapies had not worked. The primary outcome of interest was pain relief. Secondary outcomes were functional improvement, change in psychological status, return to work, reduction or elimination of opioid use/other interventions, and complications. Studies of spondyloarthropathy were excluded. Further inclusion criteria were applied as to whether sufficient detail was available on the clinical relevance of study participants, interventions and outcomes.

Included studies evaluated intra-articular injections, periarticular injections, conventional radiofrequency neurotomy, cooled radiofrequency neurotomy and pulsed radiofrequency. Trial comparison groups contained an active- or placebo-control; the only controlled observational study compared intra-articular and periarticular injection with intra-articular injection alone. Clinically meaningful pain relief was defined as at least a 3-point change on an 11-point scale of 0 to 10. Clinically significant functional improvement was defined as 40% or greater using a validated instrument. A variety of outcome measures was included (reported in the paper).

Two reviewers screened studies for inclusion.

Assessment of study quality
Cochrane criteria were used for RCTs covering randomisation, allocation concealment, blinding, completeness of outcome data, freedom from selective outcome reporting and other biases. RCTs that met 50% of the criteria were entered into the analysis. The Newcastle-Ottawa Scale was used for observational studies, which covered selection bias, comparability of study groups and outcome assessment. Observational studies that met 50% of the criteria were included in the analysis. Observational studies also had to have a minimum of 50 patients. The authors concluded with an overall strength of evidence rating based on United States Preventive Task Force criteria.

Two reviewers independently assessed the quality of included studies. Discrepancies were resolved through consensus involving a third reviewer.

Data extraction
Data were extracted on whether 50% or more pain reduction was reported in at least 40% of patients, or where there was at least a 3-point decrease in an 11-point pain score. Data to enable the calculation of relative risks was extracted for adverse events.
This process was carried out by two reviewers independently. Disagreements were resolved by discussion, or with the involvement of a third reviewer.

Methods of synthesis
Random-effects meta-analysis was planned where there were at least five RCTs of the same intervention. This was not the case, so a narrative synthesis was provided. Statistical heterogeneity was assessed using $I^2$ ($I^2$ greater than 50% indicated substantial heterogeneity).

Results of the review
Six RCTs (256 participants) and five non-randomised studies (628 participants) were included in the review. All studies were classed as clinically relevant. All six RCTs were considered to be high quality, with all achieving at least eleven out of 12 criteria. One observational study was considered to be high quality and four were moderate quality. Follow-up in the trials ranged from one to 15 months; in the observational studies this was three months to 101 months.

Intra-articular injections (four studies, including one RCT)
Three studies showed positive results for pain relief and/or function. The RCT showed positive pain relief following prolotherapy (63.6%) compared with steroid injections (27.2%) at six months and 12 months (58.7% prolotherapy versus 10.2% steroid) follow-up. Overall, the authors concluded that the evidence was limited.

Periarticular injection (four studies, including three RCTs)
Three RCTs showed significant results for pain relief and function in favour of periarticular injection with steroids or botox in the short term (three months). Overall, the authors concluded that the evidence was limited.

Cooled radiofrequency neurotomy (two RCTs)
Pain relief and function were improved across three to 12 months follow-up (where reported), when compared with placebo. The authors concluded that the evidence was fair.

Conventional radiofrequency neurotomy and pulsed radiofrequency neurotomy were each evaluated by one observational study. Results were positive up to six months follow-up. The authors concluded that the evidence was limited.

Other secondary outcomes were not reported.

Authors' conclusions
The evidence was fair in favour of cooled radiofrequency neurotomy and limited/poor for short- and long-term relief from intra-articular steroid injections, periarticular injections with steroids or botulin toxin, pulsed radiofrequency and conventional radiofrequency neurotomy.

CRD commentary
The review question was clear and inclusion criteria were adequately specified to enable replication. Relevant data sources were searched and this included attempts to retrieve unpublished material. It appeared that the review process was carried out largely with sufficient attempts to minimise error and bias. Appropriate quality assessment tools were used for the different included study designs. The method of synthesis appeared to be appropriate given that the authors’ criteria for meta-analysis were not met. Study details were provided.

The authors’ conclusion reflects the limited evidence presented and seem likely to be reliable.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.
Research: The authors stated that randomised controlled trials with appropriate selection criteria, larger sample sizes, and relevant long term outcome measures were needed.
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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.