Survival of metal-on-metal hip resurfacing arthroplasty: a systematic review of the literature
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CRD summary
The review concluded that none of the hip resurfacing arthroplasty implants met National Institute for Health and Clinical Excellence 10-year 90% implant survival and 13 studies met the NICE 90% implant survival at three years criteria. The review was generally well conducted. The authors’ conclusions were suitably cautious and appear appropriate.

Authors’ objectives
To relate the survival of hybrid metal-on-metal hip resurfacing arthroplasty (HRA) devices to the National Institute for Health and Clinical Practice (NICE) benchmark for choosing a primary total hip replacement.

Searching
PubMed, EMBASE and The Cochrane Library were searched from 1988 to June 2010 for articles published in any language. Search terms were reported. Reference lists of included articles were searched. Manufacturers of implant devices and experts in the field were contacted.

Study selection
Systematic reviews, randomised controlled trials (RCTs) and case series of a metal-on-metal resurfacing prosthesis with a cemented femoral component and uncemented acetabular component were eligible for inclusion. Studies had to report on survival of the implant (defined as the time to revision). Studies had to include a minimum of 75 HRA procedures (to ensure the learning curve was complete), use validated outcome measures, provide basic clinical details and report on the mechanism of failure.

The included studies considered the BHR device, ASR device, Conserve plus device, Cormet 2000 device, McMinn device and Durom device in patients aged 42 to 58 years.

Two reviewers independently performed study selection. Disagreements were resolved by consultation with a third reviewer.

Assessment of study quality
Quality assessment was not reported. The reviewers used GRADE criteria to score the evidence as very low, low, moderate or high quality.

The authors did not state how many reviewers performed the GRADE assessment.

Data extraction
One reviewer extracted data on the survival of procedure and on complications; these were checked by a second reviewer. Where disagreements occurred between reviewers, a third reviewer was consulted.

Methods of synthesis
A narrative synthesis was presented. Studies were grouped by outcomes. NICE criteria of 90% device survival at three years and 10 years were used.

Results of the review
Twenty-nine studies were included in the review: one RCT, 27 prospective case series and one retrospective case series. Study sample sizes ranged from 82 to 2,123 hips. Mean length of follow-up ranged from 0.6 to 10.5 years. Maximum loss to follow-up was 10%. Eleven studies had zero loss to follow-up. The quality of evidence was deemed very low.
primarily due to study design (case series) and heterogeneous reporting of radiological and clinical findings.

The survival of implants ranged from 84% to 100%. Thirteen studies that used BHR implant (eight studies), Conserve Plus (two studies), Cormet 2000 (one study) and McMinn and BHR implants together (one study) adhered to NICE’s 90% survival over three years criteria. No studies met the NICE 90% survival at 10 years criteria. The revision rate was 3.5% (primarily due to aseptic loosening). Incidence of adverse events was reported.

**Authors’ conclusions**

None of the hip resurfacing arthroplasty implants used to date met NICE 10-year 90% implant survival criteria. Thirteen studies met NICE 90% implant survival at three years criteria.

**CRD commentary**

Inclusion criteria for the review were clearly defined. Several relevant data sources were searched without language restrictions. Publication bias was not assessed and could not be ruled out. Attempts were made to reduce risks of reviewer error and bias during study selection and data extraction; whether such attempts were made for quality assessment was unclear. The quality of evidence was assessed using a standard checklist, which indicated the very low quality of the evidence (acknowledged by the authors). A narrative synthesis was presented and studies were grouped by outcome, which was appropriate.

This review was generally well conducted. The authors’ conclusions were suitably cautious and appear appropriate.

**Implications of the review for practice and research**

Practice: The authors did not state any implications for practice.

Research: The authors stated that studies with longer follow-up periods were needed. The authors noted that variation in the incidence of fracture of the femoral neck causing implant failure was poorly understood.

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