Systematic literature review: quality of life associated with insulin pump use in type 1 diabetes

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CRD summary
This review concluded that evidence of quality-of-life benefits with continuous subcutaneous insulin infusion in patients with type 1 diabetes is conflicting. The authors attributed this largely to the methodological limitations of the included studies. The authors did not carry out a formal assessment of study quality so this assertion remains speculative.

Authors' objectives
To review the published literature on the impact of continuous subcutaneous insulin infusion (CSII) on the quality of life of people with type 1 diabetes.

Searching
Published studies were sought in MEDLINE, PsycINFO, CINAHL and EMBASE up to July 2005. In addition, the Diabetes UK website, journals and links were explored, together with the Cochrane Library, Web of Science and National Institute for Clinical Excellence guidelines. References were investigated and experts in the field contacted. The search terms were documented.

Study selection
All studies in which some aspect of quality of life was measured were included in the review, e.g. diabetes-specific treatment satisfaction and flexibility. Quality of life could be measured independently or alongside biophysical measures. A range of different quality-of-life instruments were used across the included studies. To be eligible, studies needed to include participants (adults or children) with type 1 diabetes with no restrictions on age, gender or level of glycaemic control.

It was unclear if two reviewers were involved in selecting studies for the review.

Assessment of study quality
No formal validity assessment appeared to have been undertaken. However, the authors discussed methodological issues relating to the included studies.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the extraction.

Methods of synthesis
A narrative synthesis was conducted, with studies grouped according to their design and the age group of the participants. Differences between the studies were outlined in the text of the report.

Results of the review
Seventeen studies with over 1,000 participants were included in the review. Five studies were randomised controlled trials (RCTs; n=174) of a parallel or crossover design using, generally, multiple daily injections as a comparator.

The studies reported mixed results. Focusing solely on the RCTs, one reported quality-of-life benefits, three reported mixed results, and one reported no evidence of quality-of-life benefits.

Authors' conclusions
The evidence of quality-of-life benefits with CSII in this patient group is conflicting. The lack of reported benefit of the technology was probably due to methodological limitations of the included studies.
CRD commentary
The study selection criteria were briefly defined, but it is unclear whether two reviewers were involved in the selection process so as to minimise bias. The searches covered a range of resources, which ensures that studies are less likely to be missed. There was no information on whether any language restrictions were applied, but some attempt was made to find unpublished studies by contacting experts. Since the methods of data extraction were not documented, it is unclear whether attempts were made to avoid error and bias. The narrative synthesis appears appropriate given the diversity of quality-of-life assessments and the varying study designs. A formal validity assessment would have lent weight to the authors' criticisms of the methodological limitations of the included studies. Some details of the included studies were presented but the exact numbers of participants were unclear. Whilst the authors' conclusion that the evidence is conflicting appears appropriate, it is not clear that this can be attributed to methodological limitations across the included studies.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that a large-scale, multicentre patient preference controlled trial is needed to focus on quality-of-life issues and insulin pump therapy.

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