Assessment of patient-reported outcomes of insulin pen devices versus conventional vial and syringe

Molife C, Lee LJ, Shi L, Sawhney M, Lenox SM

CRD summary

The authors concluded that insulin pen devices were a preferred and more acceptable insulin delivery system than conventional vial and syringe. The authors’ conclusions represented the evidence presented, but the lack of study quality assessment made the reliability of the conclusions unclear.

Authors’ objectives

To compare patient-reported outcomes between insulin pen devices and conventional vial and syringe in diabetes patients of all ages.

Searching

MEDLINE, EMBASE, CINAHL, The Cochrane Library and DARE were searched without language restrictions from January 1980 to February 2008. Search terms were reported. Doctoral theses, non-peer-reviewed journals, reference lists of reviews and primary sources and meeting abstracts from American Diabetes Association and European Association for the Study of Diabetes were searched. Studies had to be either written in or translated into English.

Study selection

Eligible for inclusion in the review were studies of children, adolescents and/or adults with type 1 and/or type 2 diabetes that compared insulin pen use to vial and syringe use. Studies needed to be controlled for confounding and other types of bias and evaluate patient preference and/or patient-reported outcomes as either primary or secondary outcomes.

Half of the included studies contained patients with type 1 diabetes. Mean age of patients was 45 years (range eight to 79 years). Insulin pen devices were manufactured by Eli Lilly, Novo Nordisk A/S, Becton Dickinson and Company and Sanofi-Aventis. Half of the studies were industry sponsored. Patient-reported outcomes included: flexibility, acceptability, treatment satisfaction, preference, quality of life, ease of use, convenience and handling/dosing and pain. Patient-reported outcomes were assessed with a variety of questionnaires; half of the included studies used an unspecified questionnaire. Study designs included single group pre/post test, retrospective cohort and randomised crossover trials.

Two reviewers independently performed selection. Any disagreements were resolved by discussion or involvement of a third reviewer.

Assessment of study quality

The authors did not state whether study quality was assessed.

Data extraction

Main study attributes (study design, country, patient-reported outcomes, results) were extracted into a data summary table.

Two reviewers independently extracted results data and reported results as either more favourable for pen, more favourable for vial/syringe or no difference/mixed results.

Methods of synthesis

Results were presented in narrative synthesis and in a table.

Results of the review

Forty-one studies (sample size 16 to 1,622 participants) were included in the review: 26 randomised controlled trials (22
were crossover studies); 12 prospective studies (11 were single-group before/after studies); two cross-sectional studies; and one retrospective study. Follow-up ranged from two weeks to five years.

Preference (29 studies): In 28 studies most patients (>66%) preferred insulin pen devices to vial or syringe or chose and/or were willing to continue treatment with insulin pen devices instead of vial and syringe. In one study there was a similar preference for insulin pen and for vial and syringe use.

Acceptability (12 studies): In 10 studies, most patients (>75%) reported greater acceptance of insulin pen devices compared to vial and syringe. Two studies did not report greater acceptability with pen devices compared to vial and syringe.

Pain (nine studies): Eight studies reported that most patients (>50%) experienced less pain with a pen device than a vial and syringe.

Quality of life (eight studies): Three studies found a greater improvement in quality of life in patients who used an insulin pen device compared to those who used a vial and syringe. Three studies found no statistically significant difference in quality of life after using an insulin pen devices compared to using a vial and syringe. Two studies had mixed results in differences aspects of quality of life.

Satisfaction (seven studies): Five studies found that most patients (>76%) experienced higher treatment satisfaction from using an insulin pen device compared with a vial and syringe. Two studies found no significant difference in satisfaction between insulin pen device use and vial and syringe.

Convenience, handling, dosing and ease of use (10 studies): Eight studies found that most patients (56% to 100%) found insulin pen devices more convenient to use than vial and syringe. Two studies evaluated handling and dosing. The authors reported that in one study, 92% of patients considered the pen device easier to use. All nine studies that evaluated ease of use found that most patients (≥61%) found the insulin pen device easier to use than vial and syringe.

Authors’ conclusions
Insulin pen devices were a preferred and more acceptable insulin delivery system than conventional vial and syringe.

CRD commentary
The review addressed a clear research question. It was supported by adequate inclusion criteria. The search strategy was adequate. It was noted that half of the studies were industry sponsored. It was not reported whether study quality was assessed, which made it difficult to assess the reliability of reported results. In view of the differences between studies a narrative synthesis was appropriate, but more reliable evidence from studies of better design was not highlighted.

The authors’ conclusions represented the evidence presented, but the lack of quality assessment and diversity between study designs made the reliability of the authors’ conclusions unclear.

Three of the authors were employees of Eli Lilly.

Implications of the review for practice and research
Practice: The authors stated that diabetes care providers, patients and payers can all contribute to reducing barriers associated with conventional insulin therapy by incorporating favourable components (such as well-accepted insulin delivery devices) into diabetes management programmes, practice and/or protocols.

Research: The authors did not state any implications for research.

Funding
Eli Lilly and Company.

Bibliographic details

DOI
10.1089/dia.2009.0007

Original Paper URL

Other URL

Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Adult; Aged; Child; Consumer Behavior; Diabetes Mellitus /drug therapy; Equipment Design; Female; Humans; Hypoglycemic Agents /administration & dosage /therapeutic use; Insulin /administration & dosage /therapeutic use; Male; Middle Aged; Needles; Patients /psychology; Syringes; Young Adult

AccessionNumber
12010000627

Date bibliographic record published
10/03/2010

Date abstract record published
03/11/2010

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.