The efficacy of self-monitoring of blood glucose in NIDDM subjects: a criteria-based literature review

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Authors' objectives
To determine the efficacy of self-monitoring of blood glucose (SMBG) in NIDDM (non-insulin dependent diabetes mellitus) patients.

Searching
MEDLINE was searched from 1976 to February 1996 using the keywords 'diabetes mellitus non-insulin dependent' and 'blood glucose self monitoring'. The reference lists of selected studies were checked for other publications.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were included.

Specific interventions included in the review
Self-monitoring blood glucose regimens: strips were used both with and without meters.

Participants included in the review
People with NIDDM using diet or diet with oral anti-diabetic medications were included.

Outcomes assessed in the review
Glycemic control: glycosolated haemoglobin (HbA1) levels and body weight.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection.

Assessment of study quality
A qualitative methodological assessment was carried out using the following criteria: has the proposition of the research been formulated?, have hypotheses been formulated that are being tested?, are the variables unambiguously formulated?, is there a statement about the reliability and validity of the measurement methodology?, is the population defined?, are there specific criteria for inclusion/exclusion?, have appropriate statistical methods been employed?, are the answers to the proposition logically concluded from the research described? Scoring for each quality criterion was carried out by one author using a 3-point scale.

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

Methods of synthesis
How were the studies combined?
A narrative review was undertaken with individual study results presented in tabular format.

How were differences between studies investigated?
The characteristics of each study were discussed, particularly differences between the studies in the regimens followed.
Results of the review
Six RCTs with 592 participants were included.

Only one study (number of patients per group 100 out of 100) reported a positive effect of using SMBG on glycemic control (mean change of HbA1 was -0.4% in the SMBG group compared with 0.5% in the control group, p<0.05. Mean weight loss was 0.4kg compared with a gain of 0.1 kg in the control group (non-significant difference). Three studies did not show any differences between SMBG and urine testing. One study did not show any efficacy of SMBG above usual care without SMBG. No difference on the basis of any characteristic was found among the 6 studies. Four studies met all qualitative criteria.

Authors' conclusions
The main conclusion from this review is that the efficacy of SMBG in NIDDM patients is still questionable and should be tested in a rigorous high-quality RCT. In the meantime, the use of SMBG is recommended in daily clinical practice for NIDDM patients with poor glycemic control despite optimal antidiabetic therapy, with the annotation that SMBG has yet to be proven effective as a technique to improve glycemic control.

CRD commentary
The review question, search, inclusion and exclusion criteria and validity assessment were clearly defined. Details of individual studies and discussion of study characteristics was particularly informative. The authors' conclusions seem to be well-supported by the evidence presented.

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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.