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Title **Blood Glucose Self-Monitoring in Type 2 Diabetes: A Randomized Controlled Trial**

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Aim

To test whether self-monitoring of blood glucose (SMBG), used with or without instruction in incorporating findings into self-care can improve glycemia control in noninsulin treated diabetes compared with standardized usual care.

Conclusions and results

Four hundred fifty-three patients were randomized with mean (SD) HbA1c 7.5% (1.1). The differences in 12-month HbA1c between the three groups (adjusted for baseline HbA1c) were not statistically significant (P=0.12). The difference in unadjusted mean change in HbA1c from baseline to 12 months between the control and less-intensive self-monitoring groups was -0.14% (95%CI -0.35 to 0.07) and between the control and more-intensive self-monitoring groups was -0.17% (95%CI -0.37 to 0.03). SMBG was found to be significantly more expensive compared to standardized usual care, by 92 pounds sterling (GBP) and GBP 84 for the less-intensive SMBG and the more-intensive SMBG groups respectively. SMBG appears to have an initial negative impact on health status measured with EQ-5D. Cost-utility analysis showed that it is unlikely that either investigated forms of SMBG are cost effective compared to standardized usual care. In-depth interviews identified groups of patients who used SMBG to monitor the impact of different lifestyle choices and used this to motivate adherence to these choices. However, some patients did not find SMBG helpful. Questionnaires about health-related beliefs did not identify an increase in perceived control over diabetes, but did find an increase in perceived seriousness of diabetes in the group carrying out more intensive self-monitoring.

Recommendations

See Executive Summary link at www.ncchta.org/project/1330.asp.

Methods

See Executive Summary link at www.ncchta.org/project/1330.asp.

Further research/reviews required

1) The qualitative element of the trial identifies a group of patients who consider that use of SMBG provides them with motivation to adopt and maintain behaviors that lead to better diabetes control. Further work is required to characterize those who gain most benefit in terms of glycemia control and whether this is related to use of the procedure. 2) Our results suggest that routine use of SMBG may not be appropriate for reasonably well controlled patients, but its role in managing patients with less well controlled diabetes is not clear. A pragmatic strategy of self-management education with HbA1c monitoring and intensifying drug therapy may be appropriate in the first instance. If glycemia control is not then achieved, SMBG may be appropriate – firstly to explore any potential motivating effect, and secondly because insulin treatment is likely to be required. Exploring the utility of this strategy may be appropriate. 3) An increased rate of hypoglycemia is reported among individuals using self-monitoring. Further research needs to establish whether these differences are likely to result from biochemical differences or greater awareness of hypoglycemia as a cause of symptoms.

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