

Value of Self-Monitoring of Blood Glucose in Non-Insulin-Using Patients With Type 2 Diabetes

Reviewed by Michael Pignone, MD, MPH

STUDY

O'Kane MJ, Bunting B, Copeland M, Coates VE; ESMON Study Group: Efficacy of self-monitoring of blood glucose in patients with newly diagnosed type 2 diabetes (ESMON study): randomised controlled trial. *BMJ* 336:1174–1177, 2008

SUMMARY

Design. A randomized controlled trial.

Subjects. Participants included 184 adults with newly diagnosed type 2 diabetes who were not taking insulin.

Methods. Participants were randomized to receive either a structured educational program alone or a structured educational program plus additional training and advice about self-monitoring of blood glucose (SMBG). All participants received follow-up visits every 3 months with predefined treatment algorithms based on A1C level. Patients in the SMBG group were asked to complete four fasting and four postprandial measures per week and were given advice about what to do in response to high SMBG readings.

Results. Adherence to SMBG was good: 66% of participants in the SMBG group completed > 80% of requested measures. No differences between groups were observed in A1C at 12 months (6.9% in each group; mean difference 0.07%; 95% confidence interval -0.25 to 0.38) or in the incidence of hypoglycemia. Those in the SMBG group had somewhat higher scores on the depression

subscale of a well-being questionnaire.

Conclusions. The addition of SMBG did not appear to provide additional benefit for newly diagnosed, non-insulin-using patients with type 2 diabetes who were receiving care in an organized program with a strong educational component.

COMMENTARY

The question of whether to recommend regular SMBG among patients with type 2 diabetes who are not taking insulin remains widely debated within the medical community.¹ The potential benefits of SMBG include providing motivation and feedback for patients about medication changes, dietary programs, or exercise regimens, including resultant improvements in self-efficacy, as well as the ability to detect and treat hypo- or hyperglycemia. Potential downsides include the possibility of increasing negative emotions, the discomfort related to obtaining samples, and the opportunity costs of the substantial patient time and resources devoted to monitoring.² The costs to health care systems are also substantial; Davidson estimated the cost to Medicare for SMBG in 2002 to be > \$465 million.³

Several previous trials have attempted to determine the benefits of SMBG. A systematic review and meta-analysis in 2005 identified six trials and suggested that SMBG was associated with an improvement of 0.39 percentage points in A1C. The

reviewers noted that differences in co-interventions (amount and type of education) may have affected the results. Subsequently, another trial found no difference with SMBG in a group of non-insulin-treated patients with relatively good glycemic control (mean A1C 7.5%) at baseline.⁴

The ESMON trial overcomes some of the methodological limitations of previous studies. Most importantly, the educational intervention and care algorithms were the same for both groups, allowing an evaluation of the specific impact of education, training, and performance of SMBG. Initial A1C levels were high enough (8.8 and 8.6%) to allow room for improvement. Outcomes included both potential benefits (A1C and hypoglycemia) and potential harms (well-being). Costs, including patient time, were not reported. The findings of little or no benefit with SMBG, coupled with possible reductions in well-being, suggest that routine use of SMBG is not beneficial for non-insulin users within the context of a well-organized program of diabetes care that includes frequent assessments of A1C followed by algorithm-based medication adjustment.

REFERENCES

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using insulin: a systematic review. *Diabetes Care* 28:1510–1517, 2005

²Russell LB, Suh DC, Safford MA: Time requirements for diabetes self-management: too much for many? *J Fam Pract* 54:52–56, 2005

³Davidson M: Counterpoint: self-monitoring of blood glucose in type 2 diabetic

patients not receiving insulin. *Diabetes Care* 28:1531–1533, 2005

⁴Farmer A, Wade A, Goyder E, Yudkin P, French D, Craven A, Holman R, Kinmonth AL, Neil A: Impact of self-monitoring of blood glucose in the management of patients with non-insulin treated diabetes: open parallel group randomised trial. *BMJ* 335:132, 2007

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