Structured SMBG: A tool for optimising glycaemic control

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Most diabetes nurses feel strongly about the benefits of blood glucose monitoring for their patients, despite the associated costs. Unfortunately, inconclusive results from some studies of individuals with non-insulin-treated type 2 diabetes have been used to support the argument that self-monitoring of blood glucose (SMBG) provides little benefit to this group (Farmer et al, 2007; O'Kane et al, 2008).

Recently, Polonsky et al (2011) demonstrated that structured SMBG significantly improved HbA_{1c} levels and wellbeing in insulin-naïve people with poorly controlled type 2 diabetes (HbA_{1c} level 7.5–12.0% [58–108 mmol/mol]). In this study, structured SMBG came in the form of collaborative working between healthcare professionals and people with diabetes to improve their glycaemic profiles through identifying potential changes to diet, behaviour and treatment that could reduce glucose excursions.

The study was conducted in primary care centres in the USA. Participants were randomised to either a control group (enhanced usual care) or an intervention group (enhanced usual care plus structured SMBG). In total, 34 primary care practices took part and 483 individuals with type 2 diabetes were recruited – 256 to the structured SMBG group and 227 to the control group. The selected practices reflected the diversity of education, social class, and ethnicity found in primary care in the USA.

Participants in the structured group were encouraged to record (on paper) their activity and meal sizes throughout the day, together with their blood glucose levels at seven time-points. Both participants and clinicians were trained in structured SMBG, how to interpret glycaemic profiles and how best to address any problems.

Participants and clinicians were blinded to the HbA_{1c} results; therefore, any clinical treatment decisions and behavioural changes were based only on the data recorded by the study participants using the structured SMBG tool and on downloaded data from the glucose meter at consultations. The primary endpoint was the change in HbA_{1c} level at 12 months compared with baseline.

An improvement in HbA_{1c} level was seen in both treatment groups, but there was a statistically significantly greater reduction in the intervention group compared with the control group (–1.3% vs –0.8% [–14.2 vs –8.7 mmol/mol]; $P<0.003$). Both groups also reported improved general wellbeing. Interestingly, there were no differences in the results for the participants who dropped out of the intervention group compared with those in the control group, which highlights the need for engagement with behavioural change.

In the intervention group, more participants underwent treatment changes, which may account for the improved glycaemic control. However, improvements in HbA_{1c} levels were only seen in those who adhered to the self-monitoring protocol, indicating that the combined effect of behavioural change and adherence to protocol was responsible for the significantly lower HbA_{1c} levels. Of note, participants in the structured group tested less often than those in the control group, suggesting that this programme of care could lead to improved control without increased cost.

The results of this study indicate that a validated SMBG tool, a clear protocol and the knowledge to interpret the blood glucose readings can help people with diabetes to improve their glycaemic control.

In this issue of *Journal of Diabetes Nursing*, an article by Kilbride et al on physically active people with type 1 diabetes (page 73) reiterates the take-home message that diabetes nurses need to optimise patient care by motivating people with diabetes to self-manage their multiple risk factors. ■

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Farmer A, Wade A, Goyder E et al (2007) *BMJ* **335**: 132

O'Kane MJ, Bunting B, Copeland M et al (2008) *BMJ* **336**: 1174–7

Polonsky WH, Fisher L, Schikman CH et al (2011) *Diabetes Care* **34**: 262–7