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Please read this bit first

The HPCSA and the Med Tech Society have confirmed that this clinical case study, plus your routine review of your EQA reports from Thistle QA, should be documented as a "Journal Club" activity. This means that you must record those attending for CEU purposes. Thistle will **not** issue a certificate to cover these activities, nor send out "correct" answers to the CEU questions at the end of this case study.

The Thistle QA CEU No is: **MT00025.**

Each attendee should claim **THREE** CEU points for completing this Quality Control Journal Club exercise, and retain a copy of the relevant Thistle QA Participation Certificate as proof of registration on a Thistle QA EQA.

December 2007

Self-Monitoring of Blood Glucose

Blood-glucose control is critical for managing diabetes and preventing diabetes-related complications such as cardiovascular disease, retinopathy, nephropathy, and neuropathy. In addition to recommending that patients with diabetes have a glycated hemoglobin (HbA1c) measurement at least two times a year, the American Diabetes Association recommends self-monitoring of blood glucose (SMBG) as an integral part of diabetes management for patients who are treated with insulin and as a useful component for achieving glycemic goals for patients who use oral medications or medical nutrition therapy. To estimate the rates of SMBG and to track the progress during 1997 to 2006, CDC analyzed data from the Behavioral Risk Factor Surveillance System (BRFSS) for that period. This report summarizes the findings of that analysis, which indicated that the proportion of adults with diabetes who check their blood glucose at least once a day increased at the national level. In 2006, the daily SMBG rate was 63.4% among all adults with diabetes and 86.7% among those treated with insulin. Collaborations to ensure adequate health insurance coverage, diabetes education and counselling to encourage more intensive medical care and self-management practices, and continued surveillance measures to track changes in SMBG rates are needed to improve and monitor SMBG trends.

In multivariate analyses of 2006 data, the following had significant positive associations with daily SMBG: having a high school education compared with having less than a high school education; having health insurance cover; using oral medication only, insulin only, or both insulin and oral medication compared with not using insulin or oral medication; making regular doctor visits annually compared with making no visits; and having ever taken a diabetes-education course. In contrast, being male was associated with decreased odds for daily SMBG.

SMBG allows patients to adjust food intake, physical activity, or pharmacologic therapy in response to their blood-glucose readings and to assess whether their blood-glucose levels are under control. The improvement in monitoring technology makes the monitoring practice more convenient, and this might have contributed to the upward trends.

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Unlike previous studies, multivariate analysis in this study indicated no significant associations between SMBG and age, race/ethnicity, or having at least two HbA1c measurements per year. However, consistent with findings from other studies, lower rates of SMBG were correlated with being male, having less than a high school education, having no health insurance coverage, taking no medication or oral medication only, making two or fewer doctor visits annually, and not having taken a diabetes-education course. The negative associations between SBMG and lower education or lack of health insurance coverage suggest that socioeconomic barriers might impede the practice of SMBG.

The findings in this report are subject to some limitations. First, BRFSS data are self-reported and subject to recall bias. Therefore, SMBG rates might be underestimated or overestimated; further investigation of the reliability and validity of self-reported SMBG is needed. Second, BRFSS excludes persons without landline telephones. Adults with only wireless telephones tend to be younger, to have lower incomes, to be Hispanic, and to have no health insurance coverage. As a result, the SMBG rates might be overestimated and might not be generalizable to certain segments of the U.S. population. Third, the median response rate of BRFSS was only 62.5% in 1997 and 51.4% in 2006; however, the potential for bias attributed to selected respondents who refused to be interviewed is low.

Nearly 30% of adults with diabetes are using insulin, either alone or combined with oral medication. Although studies on the efficacy of SMBG for patients with type 2 diabetes not treated with insulin remain inconclusive SMBG helps persons with type 1 diabetes and insulin-treated type 2 diabetes improve their blood-glucose control. Given this scientific evidence, intervention strategies to increase SMBG should focus on persons treated with insulin.

Access to health care is an important factor associated with SMBG. Health insurance coverage of monitoring devices and supplies is integral in encouraging self-monitoring and self-management practices. Collaborations to ensure adequate insurance coverage for blood-glucose monitors, test strips, and lancets are essential for increasing the rates and benefits of SMBG. Recommendations from health professionals and the provision of diabetes education can influence the self-management practices of patients. Diabetes-education programs might increase the benefits of self-monitoring by teaching patients the optimal timing and frequency of self-monitoring, how to interpret the results correctly, and how to make appropriate diet, exercise, and pharmacologic-therapy adjustments in response to SMBG readings. Continued surveillance will be important for monitoring future trends in SMBG and the effectiveness of intervention strategies.

CPD Questions

1. Why do you think assessing blood glucose daily is less likely at the lower socio-economic level? And why do males no test as often as females?
2. What relevance do you think the conclusions of this study have for South Africa?
3. What do you think should be the way forward for diabetes monitoring in our country?