Is it time to revisit self-monitoring of blood glucose for people with type 2 diabetes?
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Background: Health burden & expenditure

- The 2010 Diabetes study estimated the total annual cost for type 2 diabetes to be $6 billion.
- Complications are the underlying component of the costs.
- The annual direct health care cost for people - was $4,025 without complications.
  - increasing to $9,645 for those with both microvascular and macrovascular complications. [1][2]
- The National Diabetes Services Scheme provides services and self-management products for those with diabetes at prices subsidised by the Australian Government.
- Nearly 755,000 people were registered (2012-13).
- Over 2.2 million packets of blood glucose monitoring test strips were distributed, with total government expenditure being over $81 million annually. [2][3]

- Given the enormous cost of diabetes and the fact that type 2 diabetes is largely preventable, any reduction in the use of self-monitoring supplies would equate to a potential cost savings. [2]

The Research Question

What is the effectiveness of SMBG for people with type 2 diabetes (medication and diet controlled) as measured by lowered A1c levels?

Aim

- To determine the efficacy of self-monitoring of blood glucose (SMBG) in reducing glycosylated hemoglobin (A1c) levels.
- To assess the benefits of SMBG in comparison to - urine testing, the use or non-use and frequency of SMBG along with patient and GP education.

Methodology

- This systematic literature review worked with past and present knowledge to explore possible future direction for the benefit of the clinical environment.
- The strategies included –
  - primary research - electronic databases
  - secondary research – landmark documents and books, government publications, evidenced based procedures, diabetes health professionals
  - inclusions – adults with type 2 diabetes; reduced A1c levels: reduction in cholesterol, weight, quality of life, cost; interventions used – SMBG, urine testing, medication use, patient education; primary journals from 1990, in English, selected worldwide
  - keywords – diabetes, type 2, self-monitoring, blood glucose, urine, A1c, quality of life, patient education

Findings / Discussion

SMBG use only with NO REDUCTION in A1c levels

- No significant difference between a monitored group (urine, blood, both methods) compared to non-monitored control group, with the expense of SMBG compared to urine testing could cover the cost of employing an additional Diabetes Nurse specialist [4]
- No association between duration of SMBG use and glucose control [5]

Increased frequency of SMBG use DID NOT LEAD to reduced A1c levels

- Frequency of SMBG use NOT related to reduced A1c levels [6][7] with increased frequency related to higher stress levels [6]
- SMBG use, non-use and frequency showed no significant differences in A1c levels, suggesting possibility of unnecessary testing [8]

Reduced frequency of SMBG use showed NO CHANGE in A1c levels

- Moderate reduction in SMBG strip use showed no changes in glucose levels, allowing significant cost savings without compromising patient care [9]

Increased frequency of SMBG use DID LEAD to reduced A1c levels

- More frequent SMBG monitoring was clinically and statistically related to better glycemic control (study supported in part by a grant from the American Diabetes Association)[10]

Conclusion

- SMBG use has not conclusively been proven to reduce A1c levels
- With the enormous cost of monitoring supplies, SMBG frequency use should be addressed wisely, being determined by a health professional, based on individual needs and glycemic goals
- Greater reduction of A1c levels seen when SMBG is used in conjunction with medication use, GP and patient education (emphasising diet and exercise)

References

[1] Coletta, D., Cangelosi, G., Connelly, K., Davies, G. & Dubin, P. 2010 Diabetes Australia-Stepping Beyond the Barrier- Type 2 Diabetes in Australia: Diabetes
  Prevention and Management, Diabetes, vol 59, p. 128-133


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