FPIN's Clinical Inquiries

Diabetes Education and Glycemic Control

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Clinical Question

Does counseling by a diabetes educator improve A1C levels in patients with type 2 diabetes mellitus?

Evidence-Based Answer

Counseling by a diabetes educator or a team of educators delivered in a variety of formats may reduce A1C levels by 0.2% to 0.8% compared with usual care alone. Diabetes educators should be considered for patients who have higher baseline A1C levels (8% to 9%) because this group had greater improvement in glycemic control after diabetes self-management education. (Strength of Recommendation: C, based on meta-analyses of randomized controlled trials [RCTs] with disease-oriented outcomes.)

Evidence Summary

A meta-analysis examined 21 RCTs focusing on group-based diabetes self-management education vs. routine care in 2,833 adults with type 2 diabetes.[1] The intervention consisted of at least one session with at least six to 24 months of follow-up. The setting for diabetes education was typically in primary care offices (12 out of 21 studies). The educators were health care professionals (physicians, nurses, or dietitians). The average baseline A1C level was 8.2%. Patients had diabetes for a mean duration of eight years, and 82% were taking diabetes medications. In the diabetes education group, A1C levels were reduced at six months (13 trials; N = 1,883; mean difference [MD] = –0.44%; 95% confidence interval [CI], –0.69 to –0.19), at 12 months (11 trials; N = 1,503; MD = –0.46%; 95% CI, –0.74 to –0.18), and at two years (three trials; N = 397; MD = –0.87%; 95% CI, –1.25 to –0.49).

A Cochrane review of nine RCTs including 1,359 adults with type 2 diabetes examined the effect of individual diabetes education vs. group education or usual care on A1C levels over six to 18 months.[2] Most of the diabetes education was performed by diabetes educators and dietitians, included face-to-face counseling, and covered the pathophysiology of diabetes, control of diabetes through diet and exercise, medication compliance, and glucose monitoring. Compared with usual care, patients receiving individual diabetes education did not have A1C improvements at six to nine months (three trials; N = 295; MD = –0.23%; 95% CI, –0.49% to 0.03%) or at 12 to 18 months (four trials; N = 632; MD = –0.08%; 95% CI, –0.25% to 0.08%). However, in patients with an average baseline A1C level greater than 8%, individual diabetes education resulted in a greater A1C decrease than usual care (three trials; N = 424; MD = –0.31; 95% CI, –0.54 to –0.09). Compared with group education, individual education resulted in a significant increase in A1C levels at six to nine months (two trials; N = 148; MD = 0.81; 95% CI, 0.34 to 1.29) but no difference at 12 to 18 months (two trials; N = 112; MD = 0.03; 95% CI, –0.02 to 0.08).

A meta-analysis of 31 RCTs including 4,263 adults with type 2 diabetes examined the effect of diabetes education on A1C levels.[3] Patients had an average baseline A1C level of 9.4%. Diabetes self-management education was broadly defined to include interventions to improve glycemic control, minimize complications, control costs, and optimize quality of life. The study included individual and teams of providers. Four trials compared self-administered education with interventions led by a lay educator. Diabetes education included individuals and groups, and was done in written, oral, and electronic formats. Mean contact time was 9.2 hours over an average of six months. One-half of the trials compared the intervention with usual care; the remaining trials compared diabetes education with another

intervention. Immediately after the intervention period, patients who received diabetes education had a greater average A1C change compared with the control group (N = 2,056; MD = −0.76%; 95% CI, −0.34 to −1.18). These improvements persisted over at least four months of follow-up (N = 1,893; MD = −0.26%; 95% CI, −0.48% to −0.05%). Increased contact time with the instructor was associated with greater improvement in glycemic control, with a 1% additional reduction in A1C for each additional 23.6 hours of contact time.

A systematic review of 120 RCTs including 22,947 patients with diabetes examined the effect of 118 unique diabetes education interventions on A1C levels.[4] Patients were randomized to usual care or diabetes education. The intervention could be completed in any setting, by any type of provider (physician, diabetes educator, registered nurse, psychologist, or social worker), and for any duration. Interventions were defined as "education intended to improve the participant's knowledge, skills, and ability to perform self-management activities that had potential to improve glycemic control," and included goal setting.[5] A meta-analysis was not done because of the study heterogeneity. The mean age of participants was 58.7 years, and the mean A1C level was 8.4%. The mean A1C reduction for all patients randomized to diabetes education was −0.74% (range = 0.6 to −2.5) vs. −0.17% (range = 1.5 to −1.7) for usual care. Of studies that used a combined group and individual education format, 86% showed a significant decrease in A1C levels. There was no significant difference in A1C reduction between interventions delivered by a solo provider vs. a group of providers. Patients with more than 10 hours of

diabetes education had a slightly greater mean A1C reduction. Diabetes education was associated with a significant decrease in A1C levels in studies that recruited patients with a baseline A1C level of at least 9%.

Recommendations from Others

An evidence-based position statement from the American Diabetes Association recommends that patients receive diabetes self-management education at diagnosis, then on an as-needed basis.[6]

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