FPIN's Clinical Inquiries

Patient Education Interventions Improve A1C Values

Sean Llewellyn, MD; Melissa Neuman, MD; and Corey Lyon, DO
University of Colorado Family Medicine Residency, Denver, Colorado
Kristen DeSanto, MSLS, MS, RD, AHIP, University of Colorado Health Sciences Library, Denver, Colorado

Clinical Question

Do patient education interventions improve A1C values in patients with type 2 diabetes mellitus?

Evidence-Based Answer

Patient education interventions, specifically those including face-to-face interactions with trained educators or nurses, improve A1C values in patients by 0.3% to 1.4% compared with usual diabetes care. (Strength of Recommendation: C, based on randomized controlled trials [RCTs] and systematic reviews of RCTs of disease-oriented outcomes.)

Evidence Summary

A 2015 meta-analysis of 132 RCTs performed in 16 industrialized countries evaluated the effectiveness of diabetes behavioral education programs compared with usual care or active controls.[1] The education had to be a multicomponent program with repeat interactions with trained teachers over at least four weeks with behavioral modifications and structured dietary or physical activity interventions. Usual care consisted of medical care without additional support. Active controls were education programs that did not meet the diabetes behavioral education program requirements. Compared with usual care, behavioral programs reduced A1C levels at the end of the intervention (mean difference [MD] = −0.35; 95% CI, −0.56 to −0.14). Results were more modest for behavioral programs compared with active control groups (MD = −0.24; 95% CI, −0.41 to −0.07). Reductions in A1C were greatest in patients with an initial baseline A1C level of 7% or higher and adults younger than 65 years. Limitations of this meta-analysis were that all trials had a medium or high risk of bias and that most outcomes were reported immediately after the interventions.

A 2017 meta-analysis examining group-based diabetes education programs compared with normal clinical care was performed on 47 studies, including 40 RCTs, four controlled clinical trials, and three cluster RCTs.[2] The trial selection criteria included face-to-face, educational group-based interventions with a minimum of four participants, a minimum of one session lasting for one hour, and A1C levels measured at baseline and six or more months from baseline. Compared with usual care, group-based interventions produced significantly decreased A1C levels (MD = −0.3%; 95% CI, −0.51 to −0.17). Limitations of this meta-analysis included a medium to high risk of bias in all included trials, a high level of heterogeneity in the studies analyzed, and that the studies were conducted in multiple countries.

A 2017 RCT of 122 adults in Portugal with a baseline A1C level of 7.5% or higher examined the effectiveness of a structured multicomponent education program on diabetes control.[3] The education group was enrolled in an education program in addition to normal clinical care. The control group received normal clinical

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care, which included three in-person visits. The education program included face-to-face education with nurses, telephone interventions, and group sessions on diabetes management that occurred over 24 weeks. When the investigators controlled for socioeconomic factors and comorbidities, only the education group had a significant decrease in A1C levels from baseline (mean decrease = −0.79%; $P < .001$) compared with the control group (mean decrease = −0.05%; $P > .05$). A limitation of this study was that patients were followed for only six months.

A 2020 RCT of 236 adults in Spain with type 2 diabetes examined the effectiveness of education delivered by primary care nurses.[4] The education group consisted of six face-to-face sessions of 30 minutes and follow-up at 12 and 24 months. The control group received usual diabetic health care. At the beginning of the trial, the intervention and control groups had comparable A1C levels (7.6% vs. 7.4%; $P = .532$). At 24 months, the A1C target (less than 7%) was achieved more often in the intervention group compared with the control group (35.2% vs. 24.7%; $P < .003$). Limitations included no blinding, no consideration of changes in medications, and that the population was sampled from a single clinic.

A 2018 RCT of 142 adults in Iran with type 2 diabetes evaluated a nurse-led diabetes self-management education program on A1C levels.[5] The control group received usual care, and the education group received nurse-led diabetes self-management education in addition to usual care over the course of 24 weeks. The education included a booklet discussing diabetes and lifestyle changes, educational movies, group sessions, and telephone follow-up. Intervention and control groups had comparable A1C levels at the beginning of the study (9.32% vs. 9.31%; $P > .05$). After 12 weeks, the intervention group had a significant decrease in A1C compared with the control group (8.6% vs. 9.3%; $P < .001$). After 24 weeks, the intervention group had an even more robust decrease in A1C values compared with the control group (7.9% vs. 9.3%; $P < .001$). Limitations included a lack of long-term data and concern that the study was underpowered for some variables.

Address correspondence to Corey Lyon, DO, at corey.lyon@cuanschutz.edu. Reprints are not available from the authors.

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