

Scott Gottlieb to step down as FDA commissioner

CLINICAL INQUIRIES

Does metformin prevent diabetes in at-risk adults?

J Fam Pract. 2013 August;62(8):436-437

By [Theresa Mangahas, MD](#); [Grace Huang, PharmD](#); [Jon Neher, MD](#); [Sarah Safranek, MLIS, AHIP](#)

[Author and Disclosure Information](#)

THE JOURNAL OF
**FAMILY
PRACTICE**

 PDF [DOWNLOAD <HTTPS://MDEGE-FILES-LIVE.S3.US-EAST-2.AMAZONAWS.COM/FILES/S3FS-PUBLIC/DOCUMENT/SEPTEMBER-2017/6>](https://mdedge-files-live.s3.us-east-2.amazonaws.com/files/s3fs-public/document/september-2017/6)

EVIDENCE-BASED ANSWER

Yes. Metformin therapy reduces the risk of developing diabetes for adults with one or more risk factors for at least 5 years (strength of recommendation[SOR]: **A**, consistent meta-analyses) and perhaps as long as 10 years (SOR: **B**, randomized clinical trial[RCT]).

Lifestyle modification with diet and exercise is approximately twice as effective as metformin for preventing diabetes, especially in older patients (SOR:**B**,RCTs).

Evidence summary

Three meta-analyses of studies lasting from 2 months to 5 years found that metformin reduced the risk of developing overt diabetes in at-risk adults when compared with placebo (TABLE).¹⁻³

Metformin is likely effective for as long as 10 years, based on long-term follow-up of patients in the Diabetes Prevention Program (DPP). In this trial, investigators randomized 3234 at-risk patients to 3 groups: metformin 850 mg twice daily; lifestyle modification (7% weight loss, 150 minutes of physical activity per week, and a one-to-one 16-lesson curriculum covering diet, exercise, and behavior modification); or placebo.⁴ At a mean 2.8-year follow-up, the incidence of diabetes was 31% lower in the metformin group (95% confidence interval [CI], 17%-43%) and 58% lower in the lifestyle modification group than in the placebo group (95% CI, 48%-66%; $P<.001$ for both comparisons).

At the close of the DPP trial, investigators offered lifestyle intervention to all 3 groups. Patients in the original metformin group continued to take metformin (with participants unblinded to assignment); patients in the original lifestyle intervention group were offered additional lifestyle support.⁵ At a median follow-up of 10 years after initial enrollment in the DPP trial, metformin reduced the incidence of overt diabetes by 18% compared with placebo (95% CI, 7%-28%), and lifestyle intervention reduced it by 34% (95% CI, 24%-42%; no statistic of comparison supplied).

Lifestyle modification works better than metformin in older adults

Another analysis found that metformin was equally effective in preventing diabetes in older and younger

patients, whereas lifestyle modification was more effective in older patients. Investigators followed the patients in the DPP trial for an additional 5 months and stratified the effect of metformin and lifestyle modification by age.⁶

Metformin's effectiveness didn't change significantly in older adults compared with younger adults (hazard ratio [HR] for developing diabetes at age 60-85 years vs 25-44 years=1.45; 95% CI, 0.98-2.16; P=.06). In contrast, lifestyle modification worked better in older adults than younger adults (HR at age 60-85 years vs 25-44 years=0.47; 95% CI, 0.28- 0.78;P<.01).

Recommendations

The American Diabetes Association says that physicians may consider using metformin to prevent type 2 diabetes in patients at the highest risk, such as patients with multiple risk factors, especially if they show progression of hyperglycemia (HbA1c \geq 6%, for example) despite lifestyle intervention.⁷

Evidence-based answers from the Family Physicians Inquiries Network

▼ References

1. Lilly M, Godwin M. Treating prediabetes with metformin. *Can Fam Physician*. 2009;55:363-369.
2. Phung OJ, Sood A, Sill BE, et al. Oral anti-diabetic drugs for the prevention of type 2 diabetes. *Diabet Med*. 2011;28:948-964.
3. Salpeter SR, Buckley NS, Kahn JA, et al. Meta-analysis: met- formin treatment in persons at risk for diabetes mellitus. *Am J Med*. 2008;121:149-157.
4. Knowler W, Barrett-Connor E, Fowler SE, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. 2002;346:393-403.
5. Knowler WC, Fowler SE, Hamman RF, et al. 10-year follow- up of diabetes incidence and weight loss in the diabetes prevention program outcomes study. *Lancet*. 2009;374: 1677-1686.
6. Crandall J, Schade D, Ma Y, et al. The influence of age on the effects of lifestyle modification and metformin in prevention of diabetes. *J Gerontol A Biol Sci Med Sci*. 2006;61:1075-1081.
7. American Diabetes Association. Executive summary: stan- dards of medical care in diabetes—2011. *Diabetes Care*. 2011;34(suppl 1):S4-S10.

Copyright © 2019 Frontline Medical Communications Inc., Parsippany, NJ, USA. All rights reserved. Unauthorized use prohibited. The information provided is for educational purposes only. Use of this Web site is subject to the [medical disclaimer](#) and [privacy policy](#).