also pointed out that the use of metformin could be a potential confounder, which was supported by the reports that metformin was associated with lower risks of colorectal cancer (4), colorectal adenoma (5, 6), and death after the diagnosis of colorectal cancer (7). This is consistent with the findings from their subgroup analyses for insulin because a lower percentage of insulin users take concurrent metformin than do non–insulin users. It was reported that DM without insulin use was significantly associated with a lower risk of colorectal adenoma (odds ratio = 0.75, 95% confidence interval: 0.56, 1.00), whereas DM with insulin use was associated with a higher risk of colorectal adenoma (odds ratio = 1.23, 95% confidence interval: 0.75, 2.02), and the lack of statistical significance might be due to the small sample size. In addition, differential use of colonoscopy or sigmoidoscopy may be another possible source of bias. DM patients may be more likely to receive a recommendation for endoscopy from their doctors or may be more self-aware of colorectal cancer risk, likely even with fewer indications, and thus more likely to overcome the barriers to undergoing colonoscopy or sigmoidoscopy. Although the prevalence of colorectal adenoma is high in African American women (8), the reported inverse association in African American women could possibly be the result of differential utilization of colonoscopy or sigmoidoscopy in the study population.

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FOUR AUTHORS REPLY

We appreciate Zhang's comment (1) on our recent article (2). Our study concluded that type 2 diabetes mellitus (DM) "was inversely associated with adenoma risk in women older than 55 years . . . but not in women 55 years or younger" (2).

This finding was unexpected, and we hypothesized that it could be related to changes in diet and other lifestyle factors after a DM diagnosis or to the use of metformin for the treatment of DM. We mentioned the small sample size for stratified analyses and the lack of details on metformin use as possible limitations of our study (2). Zhang suggests that differential use of screening endoscopy by DM status could also be a possible source of bias in our study, with DM patients being more likely to receive colorectal cancer (CRC) screening compared to women without DM (1). We believe this is unlikely because only those participants who reported undergoing a screening colonoscopy or sigmoidoscopy for CRC were eligible to be included in our nested case-control analysis (2).

Moreover, evidence of the association of DM with a higher likelihood of receiving CRC screening is conflicting. A study using National Health Interview Survey data did not find an association between DM and CRC screening among women (3). Another study using Medicare claims data suggested that CRC screening rates are lower among elderly diabetic women compared to those without diabetes (4).

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