

Medical Mistrust, Diabetes Self-Management, and Glycemic Control in an Indigent Population With Type 2 Diabetes

LEONARD E. EGEDE, MD, MS^{1,2}
YVONNE MICHEL, PHD³

Diabetes is a chronic debilitating condition associated with significant morbidity, mortality, and health care costs (1). Morbidity and mortality are higher in blacks than in whites (1). Medical mistrust by black patients has been hypothesized as a contributory factor (2); however, the evidence is inconclusive (3). The purposes of this study were to determine whether there are racial or ethnic differences in medical mistrust and ascertain the association among medical mistrust, self-management, glycemic control, and health-related quality of life (HRQOL) in an indigent population with type 2 diabetes. We hypothesized that blacks would be less trusting of the medical system and that self-management, glycemic control, and HRQOL would be significantly correlated with medical mistrust in this population.

RESEARCH DESIGN AND METHODS

We used billing records to identify all patients with type 2 diabetes in an indigent clinic of an academic medical center. Patients were contacted by telephone and invited to participate in the study. Over a 12-month period, consenting subjects completed validated surveys to assess trust in the medical care system, diabetes knowledge, diabetes self-management, perceived control of diabetes, and HRQOL. Response rate was 60% and did not differ by race or ethnicity. We only had data on race or ethnicity for responders and non-

responders, and there was no significant difference. Our institutional review board approved the study.

Trust was measured with the 15-item Medical Mistrust Index (MMI) (4). MMI measures distrust of the medical system. It is scored on a 5-point scale with a minimum score of 5 and a maximum score of 75. Higher scores indicate greater distrust of the medical system. The study was designed to have at least 80% power to detect a 3-point difference in mean scores between whites and blacks using a two-sided *t* test with type 1 error rate of $\alpha = 0.05$.

The 23-item Diabetes Knowledge Test (5) assessed diabetes-specific knowledge. Understanding of self-care and problems with diabetes control were measured with subscales from the Diabetes Care Profile (6). Perceived control of diabetes was measured with the 15-item revised Perceived Control Questionnaire (PCQ-R15) (7). HbA_{1c} and total, LDL, and HDL cholesterol measurements were abstracted from the electronic medical records. HRQOL was assessed with the 12-item short-form health survey (8).

Mean MMI scores were compared by race and ethnicity and among demographic variables using *t* tests. Pearson's correlation coefficients were calculated between mean MMI score and mean diabetes self-management scores, HbA_{1c}, and LDL, HDL, and total cholesterol, as well as the 12-item short-form health survey (Physical Component Summary and

Mental Component Summary) scores. All variable distributions were examined for extreme values and skewness and found to be approximately normal allowing the use of parametric statistical tests.

RESULTS— The sample of 216 subjects was comprised of 40% white and 60% black subjects. Whites were older (mean age: 60 vs. 55 years, $P = 0.003$), more educated (13 vs. 11 years, $P < 0.001$), and had higher income ($> \$15,000$) (41 vs. 13%, $P < 0.001$). Women comprised a significantly larger proportion among black patients (80 vs. 60%, $P = 0.002$). Duration of diabetes, body weight, marital status, employment status, and insurance status did not differ significantly by race/ethnicity. Mean MMI did not differ significantly by race/ethnicity (whites 46.0 ± 8.5 vs. blacks 45.2 ± 6.4 , $P = 0.487$).

Table 1 shows Pearson's correlation coefficients for the association between mean MMI and outcome variables. Less distrustful patients (lower mistrust scores) felt more in control of their diabetes ($r = -0.173$, $P = 0.012$). Similarly, less distrustful patients had better physical ($r = -0.141$, $P = 0.044$) and mental ($r = -0.192$, $P = 0.006$) health. Medical mistrust was not significantly correlated to glycemic control, lipid control, or other outcomes.

Since demographic characteristics were significantly different between race/ethnicity groups, each was tested for association with the outcome variables. No significant associations were detected, indicating that these differences between groups would not explain a significant proportion of the variation in the outcome variables and control for these covariates was deemed unnecessary.

CONCLUSIONS— Trust in the medical care system does not seem to differ significantly by race or ethnicity among low-income patients with type 2 diabetes. Medical mistrust may not be a major contributor to known racial/ethnic disparities in diabetes-specific health outcomes supporting findings of an earlier study that trust in physicians did not dif-

From the ¹Department of Medicine, Division of General Internal Medicine, Medical University of South Carolina, Charleston, South Carolina; the ²Ralph H. Johnson Veterans Affairs Medical Center, Charleston, South Carolina; and the ³College of Nursing, Medical University of South Carolina, Charleston, South Carolina.

Address correspondence and reprint requests to Leonard E. Egede MD, MS, Division of General Internal Medicine, Medical University of South Carolina, 135 Cannon St., Suite 403, Charleston, SC 29425. E-mail: egedel@muscedu.

Received for publication 3 September 2005 and accepted in revised form 30 September 2005.

Abbreviations: HRQOL, health-related quality of life; MMI, medical mistrust index.

A table elsewhere in this issue shows conventional and Système International (SI) units and conversion factors for many substances.

© 2006 by the American Diabetes Association.

The costs of publication of this article were defrayed in part by the payment of page charges. This article must therefore be hereby marked "advertisement" in accordance with 18 U.S.C. Section 1734 solely to indicate this fact.

Table 1—Pearson correlations for medical mistrust, diabetes self-management, metabolic control, and quality of life

| | MMI | P value |
|-------------------------------|--------|---------|
| Diabetes knowledge | 0.041 | 0.550 |
| Self-care (understanding) | 0.004 | 0.949 |
| Self-care (control problems) | 0.036 | 0.604 |
| Perceived control of diabetes | −0.173 | 0.012* |
| HbA _{1c} | 0.066 | 0.339 |
| Total cholesterol | 0.047 | 0.499 |
| LDL cholesterol | 0.072 | 0.306 |
| HDL cholesterol | 0.066 | 0.349 |
| SF-12 (PCS score) | −0.173 | 0.044* |
| SF-12 (MCS score) | −0.173 | 0.006* |

*Significant correlations at $P < 0.05$. SF-12, 12-item short-form health survey. MCS, Mental Component Summary; PCS, Physical Component Summary.

fer by race/ethnicity among elderly patients with type 2 diabetes (9). It may be that distrust of the medical care system is not as important a contributor to health disparities in diabetes as it is in other disease conditions. However, these findings would need to be confirmed in larger studies and across different patient populations because our results could be specific to our clinic population.

Another important contribution of this study is that it is the first study to date to correlate medical mistrust to objective diabetes outcome measures. Prior studies on trust have focused on the role of trust on patient-physician communication, adherence to physician recommendations, and patient satisfaction (3,10–12). In this indigent population with type 2 diabetes, medical mistrust was not significantly associated with measures of glycemic or lipid control. More studies are needed to confirm or disprove these findings and provide plausible causal relationships between trust and other diabetes-specific health outcomes.

The third addition of this study is the finding that less distrustful patients felt more in control of their diabetes and reported better physical and mental health. This finding is similar to that of an earlier study that showed that more trusting patients had lower levels of hassles with diabetes self-care (13). It appears that strategies to build trust in the patient-provider relationship and between pa-

tients and the medical care system may be effective at improving the quality of life for patients with type 2 diabetes.

This study has some limitations. We only measured medical mistrust so we cannot rule out the fact that racial/ethnic differences in trust may exist if the focus was on a different object of trust (e.g., trust in health care providers or health care insurers). Also, we did not collect information on potential mediators of patient trust such as physician characteristics, patient-provider communication, length of patient-provider relationship, and total number of visits to the same provider. These factors may provide additional information on the role of trust on health outcomes and should be included in future studies.

Acknowledgments— This study was funded by grant 5K08HS11418 from the Agency for Health Care Research and Quality, Rockville, MD.

References

1. National Institute of Diabetes and Digestive and Kidney Diseases: National Diabetes Statistics fact sheet: general information and national estimates on diabetes in the United States, 2003. Bethesda, MD, U.S. Department of Health and Human Services, National Institutes of Health, 2004
2. Anderson RM, Herman WH, Davis JM, Freedman RP, Funnell MM, Neighbors

HW: Barriers to improving diabetes care for blacks. *Diabetes Care* 14:605–609, 1991

3. Hall MA, Dugan E, Zheng B, Mishra AK: Trust in physicians and medical institutions: what is it, can it be measured, and does it matter? *Milbank Q* 79:613–639, 2001
4. LaVeist TA, Nickerson KJ, Bowie JV: Attitudes about racism, medical mistrust, and satisfaction with care among African American and white cardiac patients. *Med Care Res Rev* 57 (Suppl. 1):146–161, 2000
5. Fitzgerald JT, Funnell MM, Hess GE, Barr PA, Anderson RM, Hiss RG, Davis WK: The reliability and validity of a brief diabetes knowledge test. *Diabetes Care* 21:706–710, 1998
6. Fitzgerald JT, Davis WK, Connell CM, Hess GE, Funnell MM, Hiss RG: Development and validation of the Diabetes Care Profile. *Eval Health Prof Jun* 19:208–230, 1996
7. Wallhagen MI, Lacson M: Perceived control and psychosocial/physiological functioning in African American elders with type 2 diabetes. *Diabetes Educ* 25:568–575, 1999
8. Ware JE, Kosinski M, and Keller SD: A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Med Care* 34:220–233, 1996
9. Anderson LA, Dedrick RF: Development of the trust in physician scale: a measure to assess interpersonal trust in patient-physician relationships. *Psychol Rep* 67:1091–1100, 1990
10. Hall MA, Camacho F, Dugan E, Balkrishnan R: Trust in the medical profession: conceptual and measurement issues. *Health Serv Res Oct* 37:1419–1439, 2002
11. Safran DG, Kosinski M, Tarlov AR, Rogers WH, Taira DH, Lieberman N, Ware JE: The Primary Care Assessment Survey: tests of data quality and measurement performance. *Med Care* 36:728–739, 1998
12. Thom DH, Ribisl KM, Stewart AL, Luke DA: Further validation and reliability testing of the Trust in Physician Scale: the Stanford Trust Study Physicians. *Med Care* 37:510–517, 1999
13. Bonds DE, Camacho F, Bell RA, Duren-Winfield VT, Anderson RT, Goff DC: The association of patient trust and self-care among patients with diabetes mellitus. *BMC Fam Pract* 5:26, 2004