

Quality of Diabetes Care in the United States Between 1988 and 1995

Reviewed by Marshall Tulloch-Reid, MB, BS, MPhil, and Desmond E. Williams, MBChB, PhD

STUDY

Saaddine JB, Engelgau MM, Beckles GL, Gregg EW, Thompson TJ, Narayan KMV: A diabetes report card for the United States: quality of care in the 1990s. *Ann Intern Med* 136:565–574, 2002

SUMMARY

Objective. To assess the quality of diabetes care in the United States by applying accountability and quality improvement measures proposed by the Diabetes Quality Improvement Project (DQIP).

Design. A cross-sectional analysis of data obtained from two large nationwide studies.

Subjects and methods. Data were obtained from the Third National Health and Nutrition Examination Survey (NHANES III), conducted from 1988 to 1994, and from the Behavioral Risk Factors Surveillance System (BRFSS) for 1995. The NHANES III population was a nationwide sample of non-institutionalized U.S. citizens with deliberate oversampling of non-Hispanic blacks, Mexican Americans, and the elderly. It included an interview, a physical examination, and laboratory studies including measurement of hemoglobin A_{1c} (A1C), cholesterol levels, and triglycerides. The BRFSS 1995 sample was obtained using a random digit telephone survey method. Specific questions on laboratory testing, cholesterol levels, and eye and foot examinations were included in the

BRFSS survey for all subjects with self-reported diabetes.

This study included 1,026 subjects from NHANES III and 3,059 subjects from BRFSS, aged 18–75 years, with self-reported diabetes. Laboratory data and clinical management data were provided by NHANES III and BRFSS, respectively.

Results. A total of 28.8% of subjects reported having had an A1C measurement performed within 1 year of the study, and 85.3% reported having cholesterol levels measured within 2 years. A total of 63.3% of diabetic subjects reported having had a dilated eye examination within the past year, and 54.8% reported having had a foot examination in the same time period. Information on assessment of nephropathy was not obtained.

Elderly subjects were more likely than younger subjects to have had their cholesterol measured biannually. Subjects using insulin were more likely to report regular foot examinations and dilated eye examinations than those not using insulin. Higher education and insurance coverage were strong determinants of the level of care received. Non-Hispanic blacks were more likely than other racial and ethnic groups to have uncontrolled high blood pressure and elevated A1C results, and this effect was independent of differences in access to health care.

A total of 18% of the diabetic subjects in the NHANES III sample had an A1C test result >9.5%, and 40% had an LDL cholesterol level <130 mg/dl. A total of 65% of subjects had a blood pressure of ≤140/90 mmHg.

Conclusion. Using U.S. data collected between 1988 and 1995, a gap exists between recommended diabetes care and the care patients actually receive. This study is a benchmark for monitoring changes in diabetes care.

COMMENTARY

The article by Saaddine et al. provides important insight into the quality of diabetes care in the United States during the early 1990s and shows that there is significant room for improvement in the care offered to patients with diabetes.

The measures used to assess the quality of care were proposed by the DQIP, which was led by a committee composed of experts from the public and private sectors as well as professional organizations.¹ The DQIP recommendations were based on the scientific evidence available in 1997, and the proposed measures were tested and reviewed for feasibility and acceptability before their implementation.¹ It should be noted that the DQIP criteria were not based on management guidelines, which focus on the level of care given to individual patients, but on useful measures that can assess the quality of care provided to a population with diabetes.

The 1990 American Diabetes Association (ADA) Clinical Practice Recommendations² emphasized the importance of annual eye examinations and routine foot examinations during physical examinations for all diabetic patients. Therefore, the low number of subjects who reported receiving regular eye and foot examinations is of extreme concern, especially when very simple changes in clinic operation can increase the fre-

quency of these examinations. For instance, having patients remove their shoes and socks before they enter the examination room can greatly increase the frequency of foot examinations.³

After the release of results from the Diabetes Control and Complications Trial,⁴ the ADA's 1994 position statement on standards of care for people with diabetes⁵ included for the first time treatment targets for the management of blood glucose, lipids, and blood pressure. These recommendations on metabolic control were made toward the end of the study period under review and would not have significantly influenced the level of metabolic control observed in this study.

The increased frequency of eye and foot examinations in subjects with diabetes who were on insulin was also seen in a study of low-income patients at an outpatient clinic in North Carolina where the DQIP criteria were used to assess quality of care. The effect of insulin treatment on the odds of patients getting these examinations, however, was no longer significant after adjustment for the presence of macrovascular complications, smoking, age, and ethnicity.⁶ Therefore, it is possible that insulin therapy may be a marker of more severe disease, which warrants a more thorough evaluation by health care providers.

This study also emphasizes the role of access to health care on the quality of diabetes management. Subjects who had insurance coverage had better A1C levels and were more likely to report having had lipid tests and eye examinations. However, despite similar levels of access to health care, non-Hispanic blacks were less likely to achieve target glycemic and blood pressure control, suggesting that access issues alone cannot explain health disparities among various ethnic groups. A similar finding was observed during a recent study of members in the same health plan in Northern California where non-Hispanic blacks had the worst A1C levels and an increased risk of end-stage renal disease.⁷

The use of data from two U.S.

national surveys, which included subjects of diverse ethnicities and ages, provides us with a picture of the quality of care across the country—a picture that could not be obtained from studies assessing these indicators in one geographic region or health care setting. However, the population in each study was selected by different sampling methodologies and then combined to assess different aspects of the quality of care. It would have been preferable if all the indicators had been tested in the same national sample.

Another limitation of this study is the use of self-report to obtain diabetes quality-of-care measures, which, despite being sensitive, overestimates the frequency of eye screening and A1C measurement⁸ and is subject to recall bias. Patients are often not aware of every aspect of the examination or each laboratory test that is performed. In fact, in 1995, Fowles et al.⁸ evaluated the validity of information provided during telephone interviews by patients with diabetes enrolled in a statewide health maintenance organization. Results showed that, even with prompting, only 72.6% were able to recognize the A1C test.

We are aware of no studies that examined the reliability of the DQIP accountability measures assessed in the BRFSS, although participants have reliably reported information on some aspects of health, such as self-reported diabetes and the timing of cholesterol measurements.^{9,10} Chart review or assessment of medical claims, although difficult to obtain and time consuming, may provide a more accurate estimate of these aspects of care.

Primary care providers should remember that although the quality of care in the study period under review (1988–1995) may not reflect current diabetes management practices, the study raises several issues that continue to remain relevant to health care in the new millennium. These include:

- The need for translational research to allow research findings to be rapidly incorporated into clinical practice;

- The effect of insurance coverage and access to health care on the quality of diabetes care received;
- The importance of adjusting our diabetes management strategies to address the specific needs of the diverse populations we serve; and
- The need to encourage patients, through education, to be more aware of their health needs and to take an active role in ensuring that they receive quality health care.

We look forward to a reexamination of the issue of diabetes care in America to see the effect that the additional knowledge about the management of diabetes and its complications accumulated over the past decade has had on the quality of care. This is a landmark study from which system-wide changes in the quality of diabetes care in the United States can be measured again using the same DQIP criteria.

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Marshall Tulloch-Reid, MB, BS, MPhil, is an endocrinology fellow in the Diabetes and Arthritis Epidemiology Section of the National Institute of Diabetes and

Digestive and Kidney Diseases, National Institutes of Health, in Phoenix, Ariz. Desmond E. Williams, MBChB, PhD, is a medical epidemiologist at the Division of Diabetes Translation in the Centers for Disease Control and Prevention in Atlanta, Ga.

Erratum

A case study published in the last issue of *Clinical Diabetes* (20:198–200, 2002) was incorrectly titled “Necrotizing Fasciitis in a Patient With

Obesity and Poorly Controlled Type 1 Diabetes.” The patient in question actually had type 2 diabetes. The online version of this case study was correct-

ed in departure from print and can be viewed in its entirety at <http://clinical.diabetesjournals.org/cgi/content/full/20/4/198>.