Diabetes Care in a Predominantly Native Hawaiian and Pacific Islander Outpatient Population

Rachel Lee MD; Janet Onopa MD; Marjorie K. Mau MD; and Todd B. Seto MD, MPH

Abstract

Purpose: *Racial differences in diabetes care and outcomes, particularly among African Americans and Hispanics, have been well-recognized. The goal of this study was to evaluate the quality of diabetes care, using nationally recognized standards of care, in a multispecialty, hospital-based clinic that cares for a predominantly Native Hawaiian and Pacific Islander population.*

Methods: *We identified patients with a new primary or secondary diagnosis of diabetes during a visit (baseline visit) between January 2005 and June 2006 at the Queen Emma Clinics. Each patient's medical record was reviewed to obtain demographic and clinical information related to diabetes, including laboratory and test results and medications, from the baseline visit through 12 months follow-up. Performance indicators were selected from those recommended by the National Diabetes Quality Improvement Alliance and included selected 8 measures: 1) Hemoglobin A1c ≥ 9.0%; 2) Annual lipid panel checked; 3) Systolic blood pressure <140 mmHg; 4) LDL cholesterol <130 mg/dL) 5) Annual fundoscopic examination; 6) Foot examination; 7) Aspirin use; 8) Annual evaluation for urine protein*

Results: *We identified 364 patients, the majority Pacific Islanders (58%), with Asians (15%) and Native Hawaiians (17%) more frequent than Caucasians (10%). Compared with Caucasians, Native Hawaiians and Pacific Islanders were significantly more likely to have poor glucose control. There were no significant differences between groups for the other measures. Patients compared favorably when compared with national benchmarks. For 2 indicators, adherence was significantly higher for the total study population compared with the US average (systolic blood pressure <140 mmHg, aspirin therapy). For 2 indicators, there were no significant difference (LDL cholesterol <130 mg/dL, annual foot exam) and for 2 indicators, adherence was significantly lower for the study population (hemoglobin A1c >9%, annual fundoscopic examination).*

Conclusions: *Native Hawaiians and Pacific Islanders with diabetes have poorer blood glucose control compared with Caucasians and Asians, but the overall care is otherwise generally similar. The diabetes care received by patients in this clinic that treats a generally underserved population compares favorably with national benchmarks.*

Introduction

Over 20 million people in the United States are diagnosed with diabetes, with estimates that, in the near future, 1 in 3 Americans will develop diabetes in his or her lifetime and that diabetics will lose, on average, up to 15 years life-years.[1] Fortunately, an array of interventions to prevent or delay diabetes and its complications have emerged, including aggressive control of blood glucose, hyperlipidemia and hypertension, screening and early treatment of diabetic retinopathy and nephropathy, regular foot exams, and influenza and pneumoccocal vaccinations.

However, there are data that diabetes care has been suboptimal and varied despite widespread quality improvement efforts. Indeed, in a recently published national population-based survey, 40% of diabetes had poorly controlled LDL cholesterol, 33% had poorly controlled blood pressure, and 20% had poor glycemic control.[1] Racial differences in diabetes care and outcomes, particularly among African Americans and Hispanics, suggest that the barriers to improving the quality of care may be more substantial for some than for others.

Less is known about the care of Native Hawaiians and Pacific Islanders with diabetes. Although NHPI have a higher prevalence of diabetes and its complications than do Caucasians and Asians, how this disproportionate burden of diabetes relates to disparities in the assessment of care is uncertain. The goal of this study was to evaluate the quality of diabetes care, using nationally recognized standards of care, in a multispecialty, hospital-based clinic that cares for a predominantly underserved population.

Methods

Patient Population

We identified patients with a new primary or secondary diagnosis of diabetes during a visit (baseline visit) between January 2005 and June 2006 at the Queen Emma Clinics, a multispeciality, hospital-based outpatient clinic located at The Queen's Medical Center. Patients could be new to the clinic or have had ongoing care, but all were required to have a first-time diagnosis of diabetes. Adult medicine care is provided by primary care physicians, who are responsible for patient care and internal medicine and medical student education. Patients who attended at least one follow-up visit to the adult medicine clinic within 6 months of the baseline visit were included in the study cohort. For patients with more than one visit during the study period, the first visit was defined to be the baseline visit. Race and ethnicity information were obtained from administrative records and the medical chart and were classified as Caucasian, Asian, Native Hawaiian and Pacific Islanders. All others were classified as Other and excluded from the data analysis.

Data Collection

Each patient's medical record was reviewed to obtain demographic and clinical information related to diabetes, including laboratory and test results and medications, from the baseline visit through 12 months follow-up. Performance indicators were selected from those recommended by the National Diabetes Quality Improvement Alliance,[2] an alliance between 13 private and public national organizations to develop and maintain a national performance measurement set for diabetes. Intended to retrospectively assess the level of care, the measures have a firm evidence base, feasibility and reliability and are consistent with national standards promoted by the American Diabetes Association, American Medical Association, and others. To be consistent with the National Diabetes Quality Improvement Alliance and published benchmarks,[1,2] we selected 8 performance measures: 1) Hemoglobin A1c ≥ 9.0% (poor control); 2) Annual lipid panel checked; 3) Systolic blood pressure less than 140 mmHg; 4) LDL cholesterol <130 mg/dL) 5) Annual fundoscopic examination; 6) Foot examination; 7) Aspirin use; 8) Annual evaluation for urine protein.

Data Analysis

We used descriptive statistics to summarize the study population and compare Native Hawaiians, Pacific Islanders, and Asians with Caucasians (referent group), using parametric and non-parametric tests as appropriate. We assessed the adherence to the diabetes performance measures at the baseline visit, and at 6 and 12 months follow-up. We also compared our results to results from a recent study[1] that examined data from the National Health and Nutrition Examination Study (NHANES) and the Behavioral Risk Factor Surveillance System (BRFSS), two large, US population-based epidemiological studies. All analyses were performed using Stata 8.0 (College Station, TX).

This study was reviewed and approved by The Queen's Medical Center's Research and Investigational Review Committee.

Results

We identified 364 patients who received their first diagnosis of diabetes during the study period and had at least 1 follow-up appointment within the subsequent 6 months. Of these patients, 309 (85%) were new to the clinic and the remaining 15% of patients had established care. The majority of patients were Pacific Islanders (58%), with Asians (15%) and Native Hawaiians (17%) more frequent than Caucasians (10%). Compared with other patients, Caucasians were more likely to be male and were less likely to have hypertension, hyperlipidemia, and heart failure (Table 1). Significantly more Native Hawaiians had heart failure compared to Caucasians, despite their younger age. Nearly 90% of all patients were cared for by medical residents at their baseline visit. In general, Caucasians were less likely to be on ACE inhibitors or angiotensin receptor blockers, statins and oral hypoglycemic agents, compared with other groups (Table 1).

At 6 months follow-up, the blood pressures of Native Hawaiians (131 ± 18 mmHg), Asians (132 ± 17 mmHg) and Pacific Islanders (138 ± 21 mmHg) were similar to Caucasians (133 ± 17 mmHg). Compared with Caucasians (7.9 ± 2.3), Native Hawaiians (9.2 ± 2.6, $p < 0.05$) and Pacific Islanders (8.6 ± 2.2, $p < 0.05$) had a significantly higher hemoglobin A1c, with Asians having a similar level (7.8 ± 2.3). Compared with Caucasians (137 ± 96 mg/dL), Asians (151 ± 138 mg/dL) and Native Hawaiians (149 ± 110 mg/dL) had a slightly higher LDL level, and Pacific Islanders (123 ± 54 mg/dL) had a slightly lower level, although the differences were not statistically significant. The results were similar at 12 month follow-up (Table 2).

Table 2 displays the 8 performance measures as assessed at 12 month follow-up, with results from data from NHANES and BFRSS[1] included for comparison. Compared with Caucasians (23%), Native Hawaiians (47%, $p = 0.004$) and Pacific Islanders (30%, $p = 0.05$) were significantly more likely to have poor glucose control, defined as hemoglobin A1c > 9.0 %. In contrast, there were no statistically significant differences between groups for the other measures, although the level of performance varied between measures. For example, nearly 80% of patients had a systolic blood pressure less than 140 mmHg, but only 48% of patients had evidence of testing to detect urine protein and only 66% of patients were taking daily aspirin. Notably, only 35% of patients had documentation that an ophthalmologic exam was performed in the prior year.

Table 1.— Baseline Characteristics

	Caucasian (n=35)	Asian (n=57)	NH (n=62)	PI (n=210)
Age, years	54±13	51±15	50±13	53±12
Female	23%	51%**	47%*	55%#
Insurer				
Self-pay	11%	19%	11%	11%
Quest/Medicaid	52%	48%	58%	78%#
Medicare	23%	21%	16%	7%**
Medical History				
Hypertension	60%	75%	68%	78%*
Hyperlipidemia	57%	72%	76%	74%
Renal Insufficiency	17%	16%	19%	23%
Heart failure	3%	4%	18%*	6%
Coronary artery disease	11%	13%	4%	10%
Medications				
ACEI/ARB	57%	68%	73 %	72%
Insulin	31%	7%	22%	14%*
Oral hypoglycemic agent	40%	65%*	61%	48%
Statin	31%	63%**	65%**	63%#
Systolic blood pressure, mmHg	136±16	137±20	135±18	138±21
HbA1c, %	8.0±.2.0	8.7±2.7	9.9±2.7*	9.3±2.4*

All comparisons relative to Caucasians; **p<0.01; *p<0.05; #p<0.001; NH = Native Hawaiian; PI = Pacific Islander; ± values represent standard deviation

Table 2.— Clinical Measures

	Caucasian (n=35)	Asian (n=57)	NH (n=62)	PI (n=210)
Systolic Blood Pressure, mmHg				
6 months	133±17	132±17	131±18	138±21
12 months	128±32	136±20	124±36	132±28
HbA1c, %				
6 months	7.9±2.3	7.8±2.3	9.2±2.6*	8.6±2.2*
12 months	7.7±1.9	8.2±2.4	9.5±2.7*	8.9±2.2*
LDL, mg/dL				
6 months	137±96	151±138	149±110	123±54
12 months	152±156	166±181	171±163	140±124

Patients in this study compared favorably with US benchmark data (Table 3). For 2 indicators, adherence was significantly higher for the total study population compared with the US average (systolic blood pressure < 140 mmHg: 79% vs. 68%, $p < 0.001$; aspirin therapy: 61% vs. 45%, $p < 0.001$). For 2 indicators, there were no significant difference (LDL cholesterol < 130 mg/dL: 58% vs. 64%, $p = 0.10$; annual foot exam: 72% vs. 68%, $p = 0.17$) and for 2 indicators, adherence was significantly lower for the total study population (hemoglobin A1c > 9%: 29% vs. 21%, $p < 0.004$; fundoscopic examination: 35% vs. 68%, $p < 0.001$).

Table 3. Diabetes Performance Indicators						
	Caucasian (n=35)	Asian (n=57)	NH (n=62)	PI (n=210)	Total (n=364)	US Average
Hemoglobin A1c >9.0% (poor control)	23%	22%	47%**	30%*	29%	21%
Annual lipid profile	80%	89%	85%	89%	88%	85%
LDL cholesterol <130 mg/dL	50%	63%	51%	59%	58%	64%
Systolic blood pressure <140 mmHg	86%	82%	81%	77%	79%	68%
Annual fundoscopic examination	37%	34%	26%	37%	35%	68%
Foot examination	71%	68%	63%	76%	72%	68%
Aspirin therapy	60%	61%	66%	69%	66%	45%
Annual test for urine protein	57%	44%	50%	47%	48%	--

All comparisons relative to Caucasians; *p<0.05; **p=.004; NH = Native Hawaiian; PI = Pacific Islander

Discussion

In this study, which examined diabetes processes and outcomes of care in a hospital-based, outpatient clinic, we found that diabetes care is generally similar between Caucasians, Asians, Native Hawaiians and Pacific Islanders, and, overall, is similar to national benchmarks. To our knowledge, this is the first study to examine diabetes care in a predominantly Native Hawaiian and Pacific Islander population, and builds on previously published epidemiological studies that examined the prevalence of diabetes, risk behaviors, and diabetes-related conditions.[3]

Racial differences in diabetes care have been reported, with evidence that African Americans[4,5] and Hispanics,[4,6] but not Asians,[4] have higher hemoglobin A1c levels when compared with Caucasians. However, the magnitude and significance of these differences vary,[6,7] and when a broader number of performance indicators are assessed, racial differences in diabetes care are less distinct. For example, in a study evaluating data from NHANES, Mexican-Americans were significantly more likely to have poorly controlled blood glucose and elevated blood pressure, and less likely to receive annual cholesterol testing when compared with Caucasians. However, the rate of annual fundoscopic examinations, LDL cholesterol < 130 mg/dL and microalbuminuria were similar between the two groups.[6] In our study, Native Hawaiians and Pacific Islanders were more likely to have poor blood glucose control when compared with Caucasians, but there were no significant differences in other performance indicators.

There is, however, substantial room for improvement. Developed by the Diabetes Quality Improvement Alliance, the performance indicators used in this study define a minimal level of quality – measures of accountability and minimum standards, rather than measures of optimal care.[2] Thus, while it is notable that the care for the patients in our study is similar to national benchmarks, despite being a generally underserved population with broad cultural diversity, blood glucose control, blood pressure management and other clinical measures need to be optimized. For example, if an optimal LDL cholesterol and hemoglobin A1c levels are defined as < 100 mg/dL and ≤ 7.0% respectively, then only 34% and 41% of study subjects would be at target levels – rates that are nearly identical to national benchmarks (34% and 42% respectively).[1]

There are several limitations to our study. First, our sample is size is small and limited to a single outpatient clinic, which may affect the power of our analyses and generalizability of our findings. Second, low adherence to performance may not reflect poor quality care. Patient preferences, adherence to therapy, comorbidities and medical record documentation may all impact assessments of care. Indeed, the low rate of annual fundoscopic examinations noted in our study likely reflects difficulties documenting results from external consulting ophthalmologists, based on the number of referral requests processed by clinic staff. Third, our assessment of performance indicators focused on data 12 months after the baseline visit, although it is arguable that an earlier assessment would be more appropriate. However, we felt that a shorter follow-up period would potentially penalize physicians for indicators that are recommended annually (e.g., fundoscopic examination, lipid profile, urine protein). Moreover, for the other 5 indicators, there was no substantial difference between the 6- and 12-month assessments.

In summary, Native Hawaiians and Pacific Islanders with diabetes have poorer blood glucose control compared with Caucasians and Asians, but the overall care is otherwise generally similar. The diabetes care received by patients in this clinic that treats a generally underserved population compares favorably with national benchmarks.

No potential conflicts of interest relevant to this article were reported.

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Authors' Affiliations:
- Center for Outcomes Research and Evaluation (T.B.S.) and the Queen Emma Clinics (T.B.S., J.O.), The Queen's Medical Center, Honolulu, HI 96813
- Departments of Medicine (T.B.S., J.O., R.L.) and Native Hawaiian Health (M.K.M.), John A. Burns School of Medicine, University of Hawai'i, Honolulu, HI 96813

Correspondence to:
Todd B. Seto, MD MPH
The Queen's Medical Center
1301 Punchbowl Street
Honolulu, HI 96813
Ph: (808) 585-5439
Email: tseto@queens.org

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