Racial and Ethnic Disparities in Prevalence and Care of Patients With Type 2 Diabetes

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Study

Ferdinand KC, Nasser SA. Racial/ethnic disparities in prevalence and care of patients with type 2 diabetes mellitus. Curr Med Res Opin 2015;31:913–923

Summary

This article is a narrative review of the epidemiological data available on diabetes prevalence and care and of studies indexed in PubMed involving trials that evaluated treatments for type 2 diabetes in racial minority populations. The authors examined data from the Centers for Disease Control and Prevention and from the National Health and Nutrition Examination Survey. Table 1 provides a summary of demographic data (1–7). Because of the difficulties in gathering data for all three large racial and ethnic minorities in the United States, disparities are presented solely for African Americans compared to whites and for Hispanics compared to whites. The prevalence of diagnosed type 2 diabetes by racial/ethnic group is as follows: Asians 9.0%, African Americans 13.2%, Hispanic 12.8%, and non-Hispanic whites 7.6%. There is a wide variation in prevalance in the Native American population (e.g., 6.0% in Alaskan Natives and 24.1% in southern Arizona Native American groups) and among Hispanics (e.g., 8.5% in Central/South Americans, 9.3% in Cubans, 13.9% in Mexican Americans, and 14.8% in Puerto Ricans) (8).

Objective. The purpose of this study was to identify and describe all clinical drug trials for type 2 diabetes that included Asians, African Americans, or Hispanics.

Design. The authors conducted a literature review of studies indexed in MEDLINE and accessed through PubMed.

Methods. The authors searched PubMed using the terms African, African American, Hispanic, Asian, type 2 diabetes, biguanides, sulfonylureas, thiazolidinediones, α-glucosidase inhibitors, dipeptidyl peptidase-4 inhibitors, glucagon-like peptide-1 receptor agonists, sodium–glucose cotransporter 2 inhibitors, and individual drugs available in each class. A narrative review of the identified studies (many of which were themselves meta-analyses) was then written.

Results. Nineteen individual drugs and one drug class were tested in Asians, African Americans, or Hispanics (Table 2) (8–28). Four drugs or drug classes were tested in all three populations (Asians, African Americans, and Hispanics) (Table 3). An additonal five medications were tested in two of the three populations (Table 4). Of all of the medications or drug classes reported, only four did not include Asian subjects: exenatide extended release, canagliflozin, bromocriptine, and colesevelam. With the exeption of colesevelam, these drugs also were not tested in African Americans or Hispanics. It is important to note that the majority

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TABLE 1. Summary of Disparities Data Presented in the Article Reviewed (1–7)

	African Americans	Hispanics	Non-Hispanic Whites
Hospitalization rate (%)	26.5	—	16.1 (1)
Well-controlled glycemia (%)	37.6	—	44.0 (2)
Well-controlled cholesterol (%)	39.5	—	46.8 (2)
Well-controlled blood pressure (%)	29.0	—	35.4 (2)
Comorbid conditions of abdominal obesity, high blood pressure, elevated triglycerides, and risk of type 2 diabetes (OR)	9.1	4.8 (Mexican Americans)	2.3 (3)
Exercise rates (OR [95% CI])	0.65 (0.53–0.80)	0.34 (0.26–0.45)	[reference] (4)
Dilated eye exam (%)	64	55	64 (5)
Mean A1C increase (%)	~0.65	~0.5	[reference] (6)
7-Year incidence of diabetes (%)	+128	+67	[reference] (7)
Disparity due to socioeconomic status alone (%)	44.7	54.9	[reference] (7)

OR, odds ratio.

of studies that included Asians were performed in Asian countries (40/75 or 53%).

Commentary

This article was a narrative review of all studies of medications used to treat type 2 diabetes that were studied in Asians, African Americans, or Hispanics. We have chosen for this commentary and recommend to other researchers and authors the use of the terms "Black" and "Latino" rather than "African American" and "Hispanic," respectively, as preferred terms for these racial/ethnic groups. We recognize that "Black" is an inclusive term for African Americans, Haitian Americans, and other minorities of African descent and that "Latino" is a less inclusive term than "Hispanic," but more accurately describes this group as underrepresented in medicine (29). Of note, Ferdinand and Nasser did not present any studies of diabetes drugs in Native Americans, the group with the highest racial/ethnicity-specific prevalence of type 2 diabetes that would likely receive the most benefit from glucose-lowering therapies.

Although Asians, Blacks, and Latinos all have a higher prevalence of type 2 diabetes than whites in the United States, only four drugs/drug classes were tested in all three of these populations. These four drugs represent <20% of the available medications for patients with type 2 diabetes. This article does an excellent job of highlighting the racial/ethic disparities in drug testing. These three populations combined represent >35% (5.3% Asian, 13.2% Black, and 17.1% Latino) of the patient population in the United States, and all three populations have a higher percentage of patients with diabetes than does the white population.

Interestingly, some of the disparities data presented in the introduction of this article give the impression that health disparities are a function of access to care and socioeconomic status, both of which are limited in the U.S. Black and Latino populations. One reviewed study showed that 40–60% of diabetes disparities can be atributed to socioeconomic status alone. However, this figure is controversial and should be considered under advisement. Although the article we are reviewing did not specifically state as much, no discussion of health disparities would be complete without recognition and confrontation of racism in the United States (30). The Institute of Medicine's 2002 report "Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care" cited racism and stereotyping as major contributors to health disparities (31). Unfortunately, recent current events suggest that racism persists in the United States.

Although there are severe disparities in drug testing, virtually all of the medications mentioned in this review article are used in U.S. Asian, Black, and Latino populations. We would suggest testing in these populations, but because of severe historical abuses by medical researchers (e.g., the Tuskeegee Syphillis Experiment and the case of Henrietta Lacks), such testing it may be difficult without close monitoring and regulatory control. However, more studies could be performed with patients who are currently taking these medications. Perhaps more rigorous postmarketing surveillance could be undertaken to elicidate the differing effects of medications in Black, Latino, Asian, and Native American populations.

It is encouraging to see affordable medications being studied in Black and Latino populations. Clinical trials on metformin and sulfonylueas have great significance in these minority groups because these drugs

TABLE 2. Drug Therapies Studies in African-American, Hispanic, or Asian Populations and Included in the Article Reviewed (8–28)

Medication	Observed Racial/Ethnic Difference
Sulfonylureas	Associated with increased arterial stiffness in African Americans (9)
Acarbose	Improved glycemic control (A1C reduction of 1.05%) in Asians who were inadequately controlled on a sulfonylurea; not tested in African Americans or Hispanics (10)
Voglibose	Tested only in Asians and found to be inferior to sitagliptin and dosed more frequently; caused more adverse events without better glycemic lowering (A1C reduction of 0.7% for sitagliptin and 0.3% for voglibose (11)
Miglitol	1.9% reduction in A1C in African Americans (12); 0.26% A1C reduction in Hispanics (13)
Sitagliptin	A1C reductions of 0.9% (14) and 1.0% (15) in Asians; not tested in African Americans and Hispanics
Saxagliptin	Studied in African Americans and Hispanics but no subgroup analyses were performed; A1C reduction of 0.84% in Asians with few side effects (16)
Linagliptin	A1C reductions of 0.63% in Hispanics (17) and 0.58% in African Americans (18)
Vildagliptin	Improved glycemic control in Asians when added to metformin (19)
Alogliptin	A1C reductions in Japanese patients when added to voglibose (20)
Metformin	African Americans had better A1C lowering than non-Hispanic whites (21); increased arterial stiffness in African Americans (9)
Pioglitazone	Improved β-cell function and insulin secretion and supressed gluconeogenesis in Mexican Americans (22)
Rosiglitazone	Increased hepatic insulin extraction and improved glycemic control in African Americans with impaired glucose tolerance and type 2 diabetes (23)
Nateglinide	There is one publication on the use of this drug in Asian patients, but no A1C data were reported. (8)
Repaglinide	There is one publication on the use of this drug in Asian patients, but no A1C data were reported. (8)
Exenatide	A1C reductions reported in Asians (24)
Liraglutide	A1C reductions reported in Asians (25)
Lixisenatide	A1C reductions reported in Asians with diabetes ineffectively controlled with insulin or metformin ± a sulfonylurea (26)
Dapagliflozin	A1C reductions of 0.41–0.45% in Asians (27)
Empagliflozin	Studied in African-American and Asian populations, but no data on A1C reduction were reported (28)
Colesevelam	Tested in Hispanic patients, but no data on A1C reduction were reported (8)

TABLE 3. Drugs Tested in All Three Racial/Ethnic Groups

Medication	Percentage of Studies That Included:		
	African-American Subjects	Hispanic Subjects	Asian Subjects
Sulfonylureas	31	39	33
Miglitol	44	49	6
Metformin	19	15	19
Rosiglitazone	12	13	2.9

are inexpensive and usually are easy to access; they are free in certain places and cost only a few dollars per month in others (32). Because of their ease of accessibility, there is less extrapolation and undocumented opinion about the benefits and side effects of these drugs in Blacks and Latinos.

What is more concerning is the paucity of clinical trials of newer diabetes drugs that include Black, Latino, and Native American subjects. These drugs will likely increase in importance as the diabetes epidemic expands. Because diabetes affects minorities at an disproportionate rate, the lack of clincal trials involving these groups may mean more experimentation with newer diabetes drugs in the absence of research evidence of their efficacy and effects. This scenario could lead to adverse events, hospitalizations,

TABLE 4. Drugs Tested in Two of the Three Racial/Ethnic Groups

Medication	Percentage of Studies That Included:		
	African-American Subjects	Hispanic Subjects	Asian Subjects
Linagliptin	17	0	82
Empagliflozin	2	0	57
Pioglitazone	0	21	79
Exenatide	0	9	84
Colesevelam	0	100	0

increased health care costs, and possibly deaths.

The authors of this article had numerous industry relationships to disclose, including writing services from a drug company–paid writer and drug company review of the manuscript before submission. Such potential conflicts of interest can be problematic in that they open the article up to possible industry bias. We applaud the authors for disclosing their conflicts of interest, but at the same time, we must caution readers about the information presented in this article, as well as the information that may have been omitted. There is good comparative efficacy research being done at the Agency for Healthcare Research and Quality that may be of use in conjuction with this article to further elucidate disparities in care and provide additional information on the efficacy of diabetes medications in Asian, Black, Latino, and Native American populations.

Duality of Interest

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

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