Identifying the comorbid conditions affecting Hemoglobin A1c levels of diabetes among African American population

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Introduction

- The prevalence of diabetes mellitus among African Americans has increased dramatically in the past decades, from 8% in 1988 to 1994 to the current rates of 21.8%. (according to NHANES)

- African American men develop diabetes mellitus 1.52 times (95% CI, 1.31–1.78) more often than white men.

- African American women are 2.14 (95% CI, 1.86–2.46) times more likely to develop diabetes mellitus than white women.

- The diagnosis of diabetes mellitus is made by a combination of fasting glucose, post challenge glucose, and hemoglobin A1c.

Introduction

- Normalizing HbA1c level to target < 7% or ≤ 6.5%, can reduce DM-related morbidity and mortality as well as the incidence and progression of complications.

- Adults with diabetes have at least one morbid chronic disease, and 40% have three or more.

- The importance of treating patients with T2DM to target glycemic levels applies to patients with and without comorbidities in the same way.

- However, evidence-based diagnostic and treatment strategies generally overlook comorbidity.

Objective

- The outcome of interest was to identify comorbidities associated with diabetic patients who have poorly-controlled HbA1c (ie ≥ 7.0) vs well-controlled HbA1c (ie < 7.0).
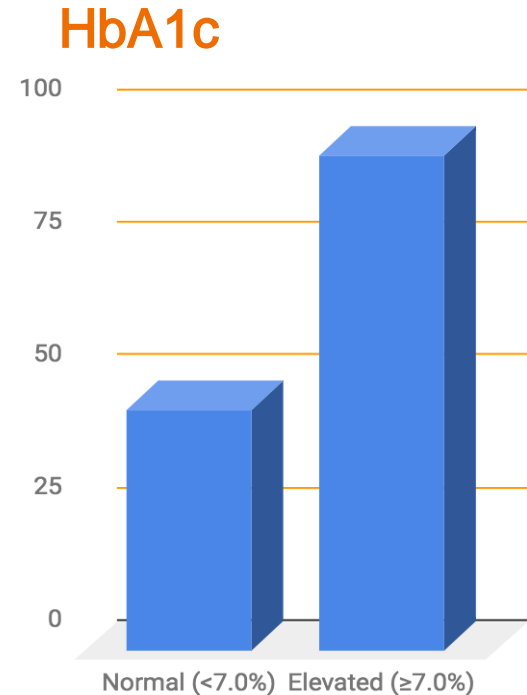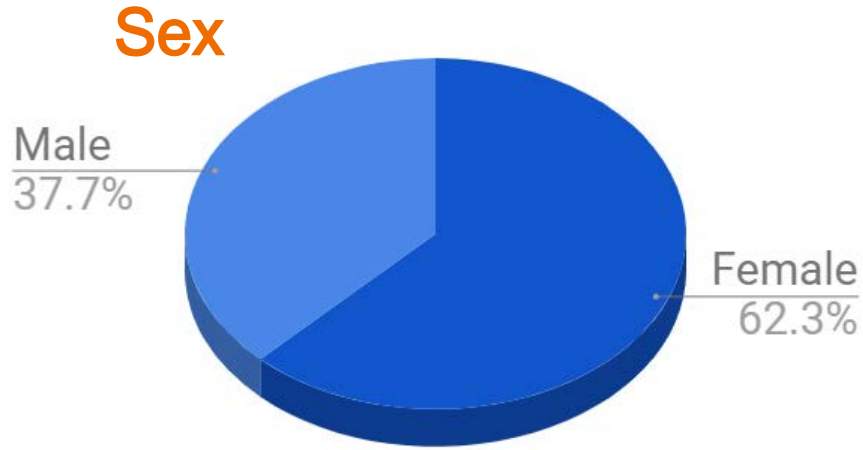
Research Design and Methods

- We conducted a retrospective case-control study using multivariate logistic regression.

- The data used was most recent Hemoglobin A1c levels recorded in the EMR and the most recently provided histories and ICD-10 diagnoses.

- Adult patients with a diagnosis of diabetes mellitus who had > 1 encounter, during the years 2016 to 2018 (index period) were included.
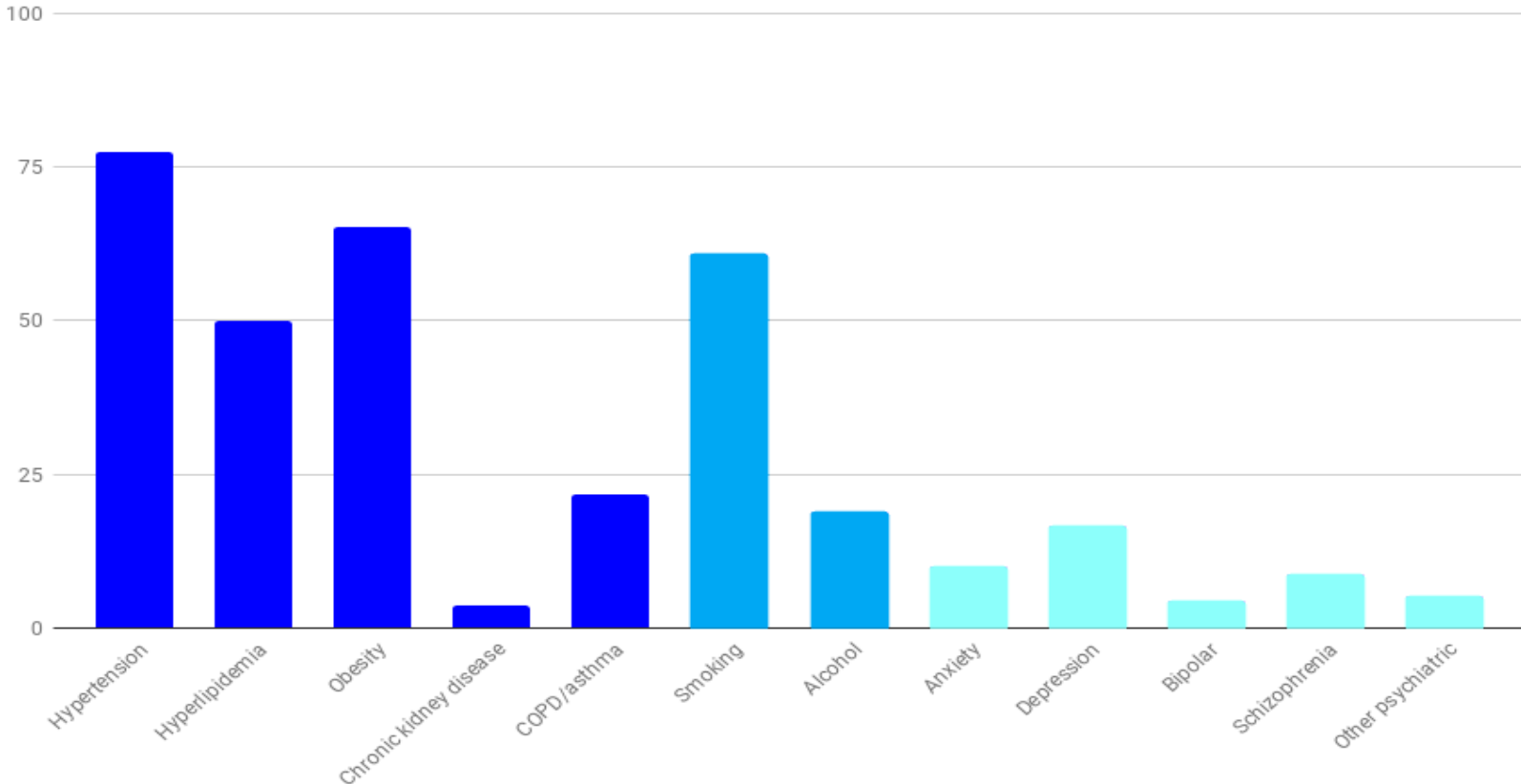
Research Design and Methods

- The number of cases of patient's characteristics and comorbidities were counted and prevalence was used to show the distribution of these qualities across multiple strata.

- Diseases with a prevalence <1% were excluded. HbA1c values were divided into two groups, defined as poorly-controlled (≥ 7.0%) and well-controlled (< 7%).
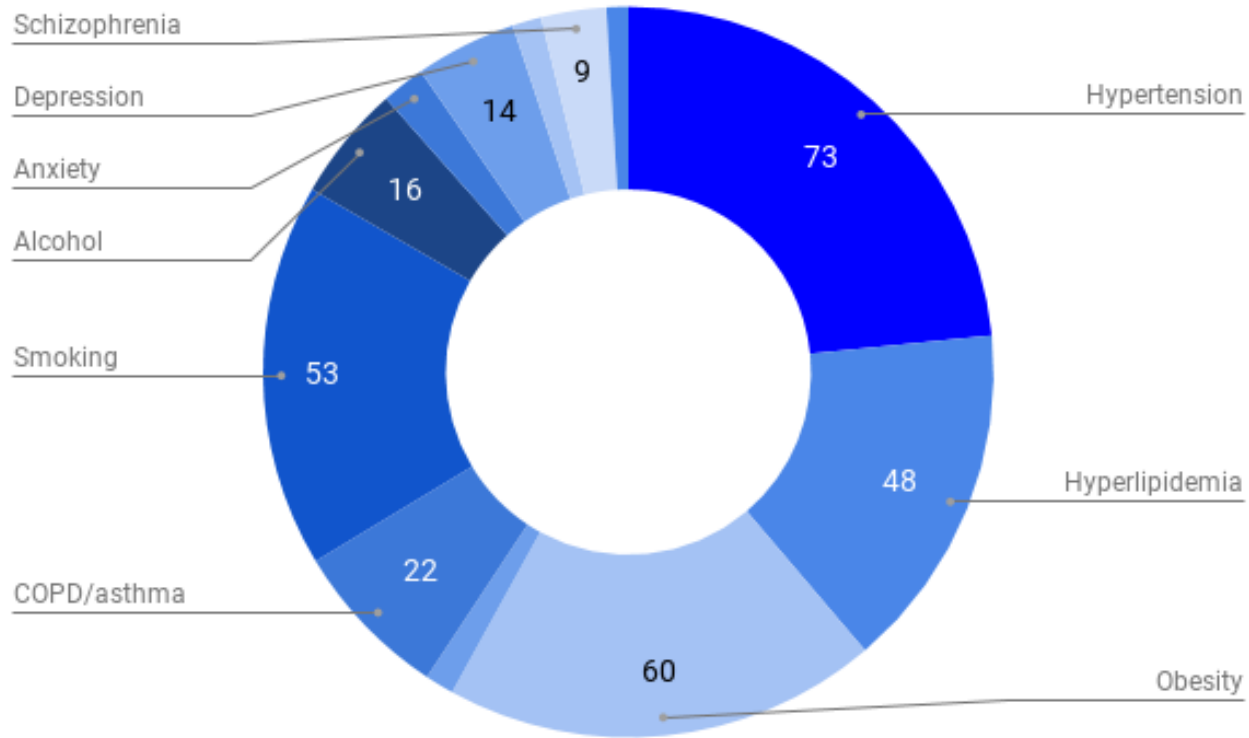
Characteristics of the patients included in the study

Prevalence of comorbidities

Comorbidities of patients with HB A1c≥

- Schizophrenia
- Depression
- Anxiety
- Alcohol — 16
- Smoking — 53
- COPD/asthma — 22
- Hypertension — 73
- Hyperlipidemia — 48
- Obesity — 60
- 14
- 9

Research Design and Methods

- We then used binary logistic regression to quantify and evaluate the association of characteristics and comorbidities with poorly-controlled HbA1c.

- Statistical analyses were performed using MedCalc for Windows, version 18.2.1 (MedCalc Software, Ostend, Belgium).

Binary logistic regression of comorbidities to elevated HbA1c

	HbA1c		Logistic regression	
	≥7.0% (*n* = 93)		OR	(95% CI)
Comorbidities:				
Medical comorbidities				
Hypertension	73	(68.2)	1.13	(0.40–3.25)
Hyperlipidemia	48	(69.6)	1.17	(0.48–2.83)
Obesity	60	(66.7)	1.97	(0.46–2.47)
Chronic kidney disease	4	(80.0)	1.30	(0.13–13.19)
COPD/asthma	22	(73.3)	2.59	(0.84–7.93)
Social comorbidities				
Smoking	53	(63.1)	0.62	(0.27–1.46)
Alcohol	16	(61.5)	0.67	(0.23–1.96)
Psychiatric comorbidities				
Anxiety	6	(42.9)	0.20	(0.05–0.85)
Depression	14	(60.9)	1.43	(0.41–5.01)
Bipolar	4	(66.7)	0.81	(0.11–5.88)
Schizophrenia	9	(75)	0.94	(0.20–4.43)
Other psychiatric	3	(42.9)	0.27	(0.04–1.79)

Discussion

Financial Burden

- The estimated total economic cost of diagnosed diabetes in 2012 is $245 billion, a 41% increase from the previous estimate of $174 billion (in 2007).

- This estimate highlights the substantial burden that diabetes imposes on society.

- Diabetic patients face higher out-of-pocket medication costs than people with almost any other chronic condition, and some underuse preventive services as a result of cost pressures .

Health Care System Challenges

- Providers see patients during brief office visits and are overwhelmed by the number of health maintenance activities recommended by guidelines and quality monitoring agencies.

- When diabetic patients have multiple chronic conditions, screening, counseling, and treatment needs can far exceed the time available for patient provider visits.

- Health problems that used to be treated in inpatient settings are increasingly managed within outpatient care, further straining providers' resources for addressing diabetes-specific management goals.

- With an inadequate health system support and little guidance about how to manage multimorbid patients, diabetes providers can become frustrated with their inability to meet patients' multiple treatment demands.

Conclusion

- Essential research remains to be done on how to best organize care for diabetic patients with comorbid conditions to maximize clinical outcomes and quality of life, including research on how to help patients and clinicians set management priorities and on how to evaluate the quality of care these patients receive.

- The current study, done by collecting and analyzing data from a small clinic on Chicago's south side, provides a model that may be distinguished from most larger studies while still applicable to other underserved inner-city areas.

- A comprehensive approach with managing comorbidities in diabetic patients by primary care physicians will prove to be of paramount importance with regards to effective control of A1c levels.

Questions?