Predictors of Initial Antihypertensive Intensity in Newly-Treated Hypertension Patients with Hypertension

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BACKGROUND & OBJECTIVES

- Hypertension (HTN) affects ~120 million individuals in the US
- **Black or African Americans (BAA)** individuals have a **higher prevalence** of HTN **and lower HTN control** than Whites
- Previous studies have **reported disparities in anti-hypertensives** (anti-HTN) prescribing in prevalent users
- However, it is unclear whether these disparities exist from treatment initiation or evolve over time
- Also, it is not only important to evaluate the classes of anti-HTN prescribed but also the **intensity of treatment onset**

  Therefore, we aim to examine disparity in treatment intensity at the onset of treatment, and whether such disparities could be explained by other clinical factors (BP, comorbidities, etc.)

METHODS

Data Source
- We conducted a retrospective cross-sectional study using One Florida linked claims+ EHR data from 2013 to 2020

Study Population
- We included adults (≥ 18 years) with newly-treated HTN. These patients were Florida Medicaid & Medicare recipients diagnosed with HTN (ICD-9/10 401.X & I10) and prescribed ≥1 first-line anti-HTN during the study period with no fills during the year prior

Outcome
- Total Therapeutic intensity score (TTIS)= A patient's Total Daily Dose (TDD) divided by the recommended max TDD summed across the entire regimen

Statistical Analysis
- We used generalized linear models to estimate the differences in TTIS by sex, race and ethnicity.
- In our adjusted analysis we controlled for demographics and clinical factors such as blood pressure (SBP & DBP), body mass index (BMI), heart failure (HF), chronic heart disease (CHD), atrial fibrillation (AF), etc. and used multiple imputation for the missing values of SBP, DBP and BMI.

Sensitivity Analysis
- Stratification by Medicaid and Medicare.
- Cohort restricted to a subset of patients having same National Provider Identifier for the EHR-based encounter and claims-based dispensing record. This is was to ensure that actual BP measured at the visit led to treatment decisions.
- We excluded patients with HF, CHD and AF since anti-HTN can also be prescribed for other indications.

CONCLUSION

We observed disparities in treatment intensity by sex and race that were not explained by differences in other clinical factors. Additional research is needed to explain the discordance observed between prior literature indicating worse BP control and outcomes among Black individuals despite the apparent greater treatment intensity at therapy onset.

Table 1

Characteristics	N (%) or mean ±SD
No. of patients	4094
Mean age (years) Mean SBP (mmHg) Mean DBP (mmHg)	56.8 ± 18.5 140.6 ± 20.2 82.4 ± 12.2
Sex	
Female	2358 (57.6)
Male	1736 (42.4)
Race	
White	2321 (56.7)
BAA	1552 (37.9)
Asian	24 (0.6)
Other	197 (4.8)
Data Source	
Florida Medicaid	1744 (42.6)
Medicare	2350 (57.4)
Ethnicity	
Hispanic	221 (5.4)
Not Hispanic	3824 (93.4)
Other	49 (1.2)

Analysis	Predictors	Characteristics	Ref	Difference in TTIS (95% CI)
Unadjusted (N=4094)	Sex	Male	Female	7.6 (3.9, 11.3)
	Race	Black	White	10.5 (6.6, 14.4)
	Ethncity	Not Hispanic	Hispanic	-2.0 (-10.2, 6.2)
Adjusted (N=4094)	Sex	Male	Female	7.9 (4.1, 11.6)
	Race	Black	White	17.1 (13.1, 21.1)
	Ethncity	Not Hispanic	Hispanic	-7.2 (-16.2, 1.6)
FL Medicaid (N=1744)	Sex	Male	Female	3.9 (-1.1, 9.1)
	Race	Black	White	14.7 (9.6, 19.7)
	Ethncity	Not Hispanic	Hispanic	-4.1 (-15.7, 7.5)
Medicare (N=2350)	Sex	Male	Female	7.8 (2.7, 13.0)
	Race	Black	White	18.4 (12.3, 24.4)
	Ethncity	Not Hispanic	Hispanic	-5.9 (-19.1, 7.1)
NPI linked (N=2904)	Sex	Male	Female	6.1 (1.9, 10.2)
	Race	Black	White	17.7 (13.3, 22.0)
	Ethncity	Not Hispanic	Hispanic	2.4 (-9.9, 14.7)
Excluded HF, CHD, AF (N=3522)	Sex	Male	Female	8.6 (4.7, 12.5)
	Race	Black	White	15.7 (11.6, 19.9)
	Ethncity	Not Hispanic	Hispanic	-5.7 (-14.8, 3.2)

Predictors: Sex, Race, Ethncity

Difference in TTIS (axis: -20 -15 -10 -5 0 5 10 15 20 25)

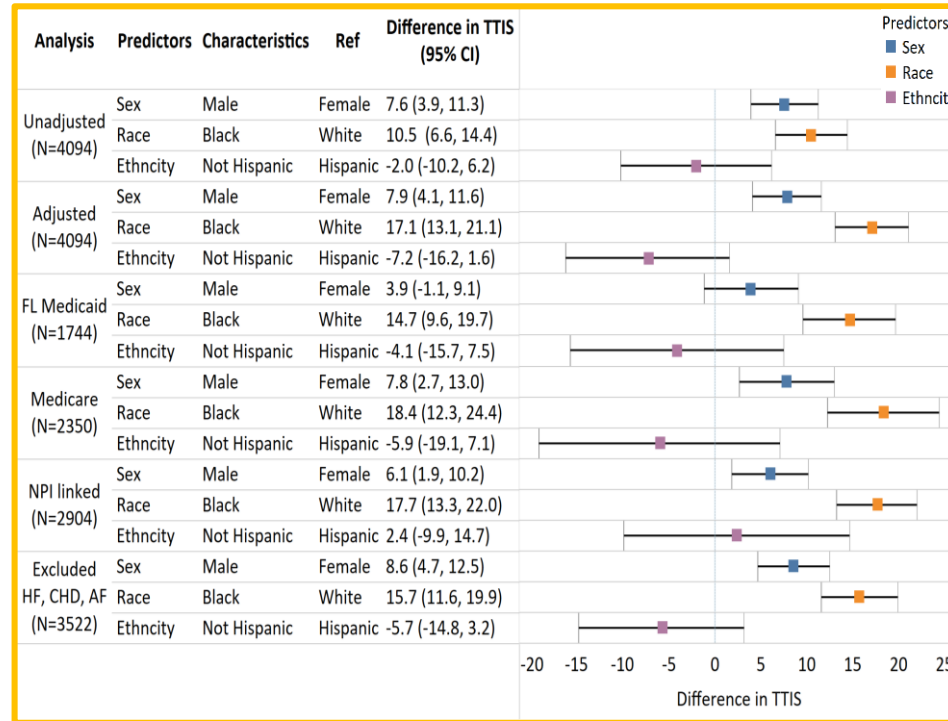**Figure 1**

RESULTS

- A total of 4094 patients (mean age 58.6±18.5; female 57.6%; White 56.7%) were included (Table1).

Unadjusted analyses
- Men averaged a 7.6% (95% CI: 3.86%– 11.3%) greater TTIS versus women.
- Black individuals averaged 10.5% (95%CI: 6.63%–14.4%) greater TTIS versus White individuals

Adjusted Analysis
- Men had 7.9% (95% CI: 4.14%–11.6%) greater TTIS versus women
- Black individuals had 17.1% (95% CI: 13.1%–21.2% greater TTIS versus White individuals

Sensitivity Analysis
- Overall, the results were robust across the sensitivity analyses (Figure 1).

DISCUSSION

- To the best of our knowledge this is the first study that looked at treatment intensity at therapy onset for anti-HTN
- No disparities were observed by ethnicity.
- In the unadjusted analyses, Men had greater TTIS than women and Black individuals had greater TTIS versus Whites
- **These disparities persisted or increased after adjusting for the clinical factors.**
- We observed **greater treatment intensity in Blacks** at therapy onset and yet worse **outcomes** have been reported by previous studies
- The question remains as to whether there is a need to change race-based HTN guidelines or other factors such as adherence, genetic difference, access to healthcare etc. are at play

LIMITATIONS

- We used robust methods to identify new-user cohort using claims linked EHR data but not all patients may have initiated therapy for HTN
- But we adjusted for the presence of any comorbidities in our look back period
- Also, we conducted sensitivity analysis by excluding patients with HF, CHD and AF
- Publicly insured individuals were included, which may have limited generalizability

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