

TREATMENT PATTERNS AMONG PATIENTS PRESCRIBED PDE-5 INHIBITOR MONOTHERAPY FOR PULMONARY ARTERIAL HYPERTENSION

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Background

- Pulmonary arterial hypertension (PAH) is a rare progressive disease which frequently results in right heart failure (RHF) and premature death.
- FDA approved PAH-specific therapies target the endothelin-1 (ERAs), prostacyclin (PGI₂, analogues, agonist) and nitric oxide (Phosphodiesterase type 5-Inhibitor (PDE-5i) and soluble guanylate cyclase stimulators (sGCs)) pathways.
- Current published data on PDE-5i healthcare utilization, cost, and treatment are limited. A couple of studies have examined healthcare utilization & cost with sildenafil monotherapy. However, no healthcare utilization data exist on tadalafil monotherapy.

Objective

- To evaluate treatment patterns and healthcare costs associated in patients initially treated with PDE-5i monotherapy for pulmonary arterial hypertension.

Methods

Study Design:

- Retrospective cohort database study using IMS PharMetrics Plus database, a U.S. claims database including medical and pharmacy claims for >85 million commercially insured patients from 90 health plans.
- The study period was 7/1/2008-12/31/2014 and the index period was 1/1/2009-12/31/2013.(index date-first claim for a PDE-5i).

Sample Selection:

- Patients 18 years old or greater, with ≥2 claims for PAH diagnosis (ICD-9-CM 416.0 or 416.8) and ≥1 claim for a PDE-5i with continuous enrollment ≥6 months before and a minimum of 12 months following the index date.
- Patients must also have ≥1 medical claim for a right heart catheterization or Doppler echocardiogram in the pre-index period.
- Patients not on monotherapy, defined as a prescription claim for endothelin receptor antagonist (ERA) or prostacyclin analogue with days supply that overlaps (1 or more days) with the patients' index date, were excluded.

Measures:

- Time to treatment modification defined as days between first prescription and discontinuation, augmentation or medication switch, measured via Kaplan-Meier survival analysis and Cox Proportional Hazards model.
 - Independent covariates in the Cox PH model were: index drug, age, gender, region, payer type physician specialty, prior medication use, comorbidity history, Charlson comorbidity score, and pre-index costs.
- All-cause health care resource utilization and costs were measured and reported over the 12-month follow-up period.
 - All costs in the one year following index were inflated to 2014 dollars
- Statistical tests of significance were t-test for continuous variables and chi-square test for categorical variables (alpha=0.05).

Acknowledgements

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Results

Figure 1. Patient Cohorts

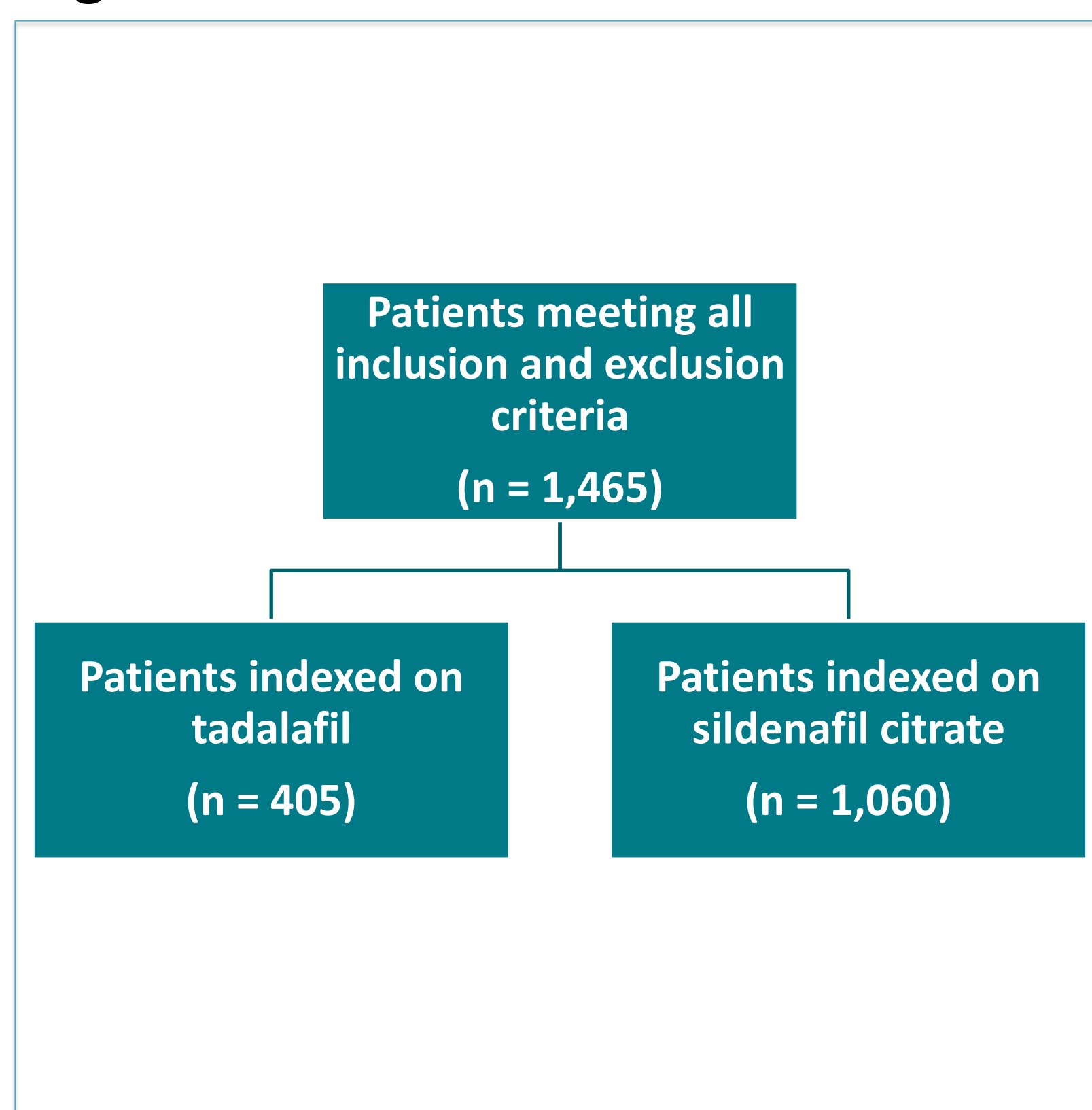
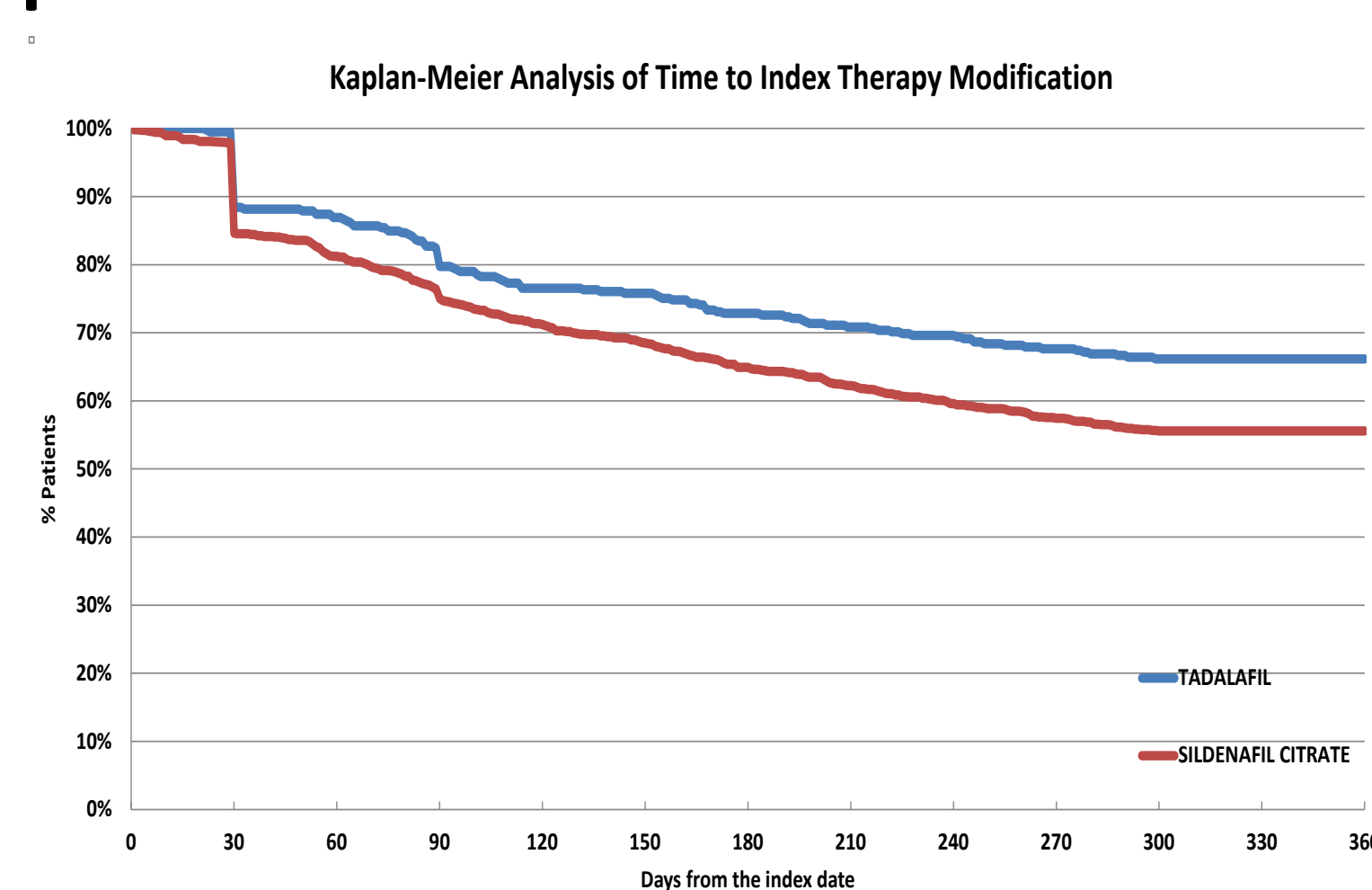


Table 1. Baseline Characteristics

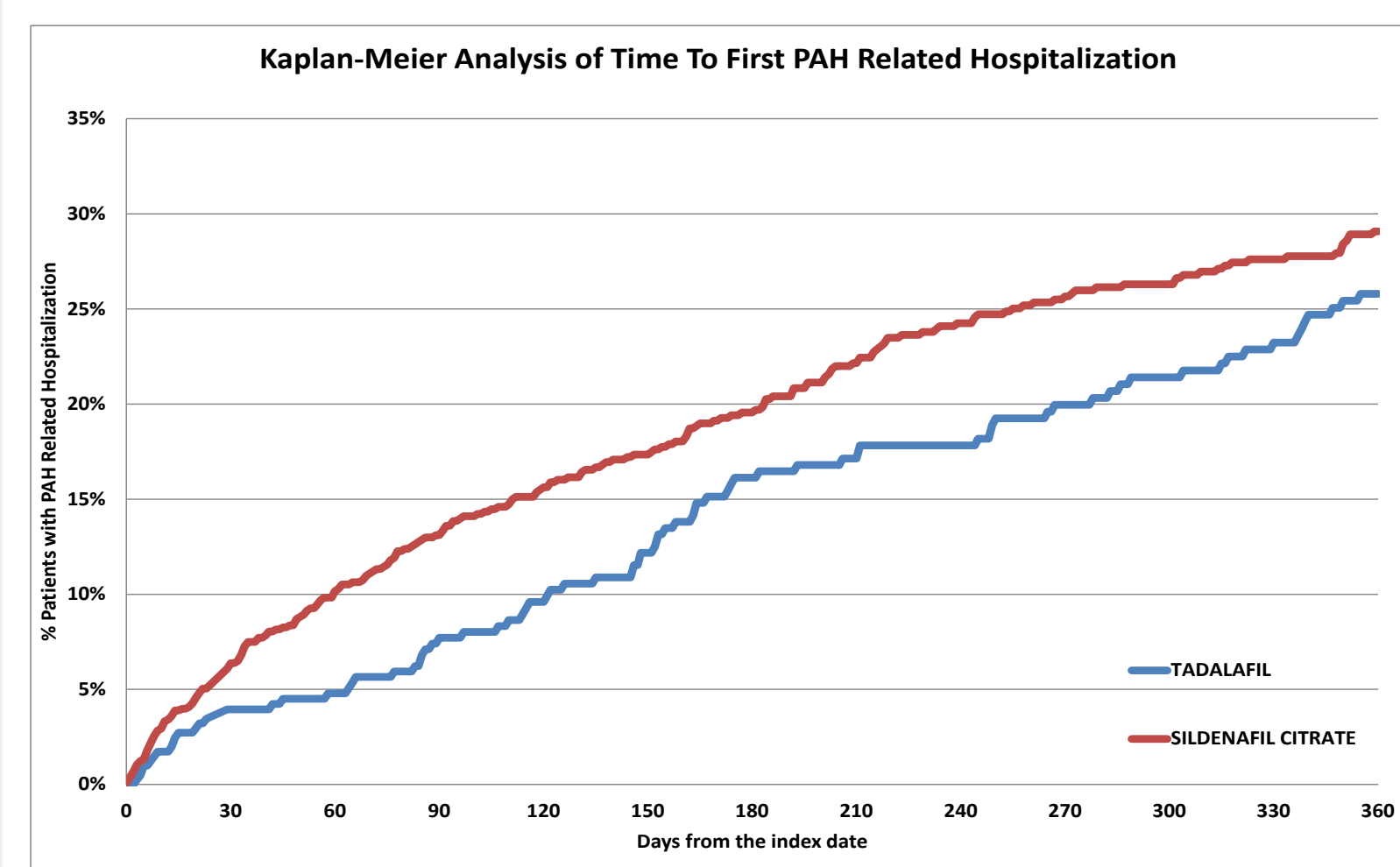
Clinical Characteristics	All Patients (n = 1,465)	Patients indexed on tadalafil (n = 405)	Patients indexed on sildenafil citrate (n = 1,060)	P-value
	Age: (years)			
Mean (SD)	58.1 (13.0)	56.4 (12.6)	58.8 (13.1)	0.0020
Median (IQR)	59 (15)	57 (16)	59 (16)	0.0017
Age Group: (n, %)				
18 - 34 years	72 4.9%	19 4.7%	53 5.0%	0.0145
35 - 44 years	122 8.3%	45 11.1%	77 7.3%	
45 - 54 years	344 23.5%	106 26.2%	238 22.5%	
55 - 64 years	518 35.4%	143 35.3%	375 35.4%	
65+ years	409 27.9%	92 22.7%	317 29.9%	
Gender: (n, %)				
Female	875 59.7%	243 60.0%	632 59.6%	0.8952
Male	590 40.3%	162 40.0%	428 40.4%	

Figure 2. Treatment modification during the 12-month post-index period



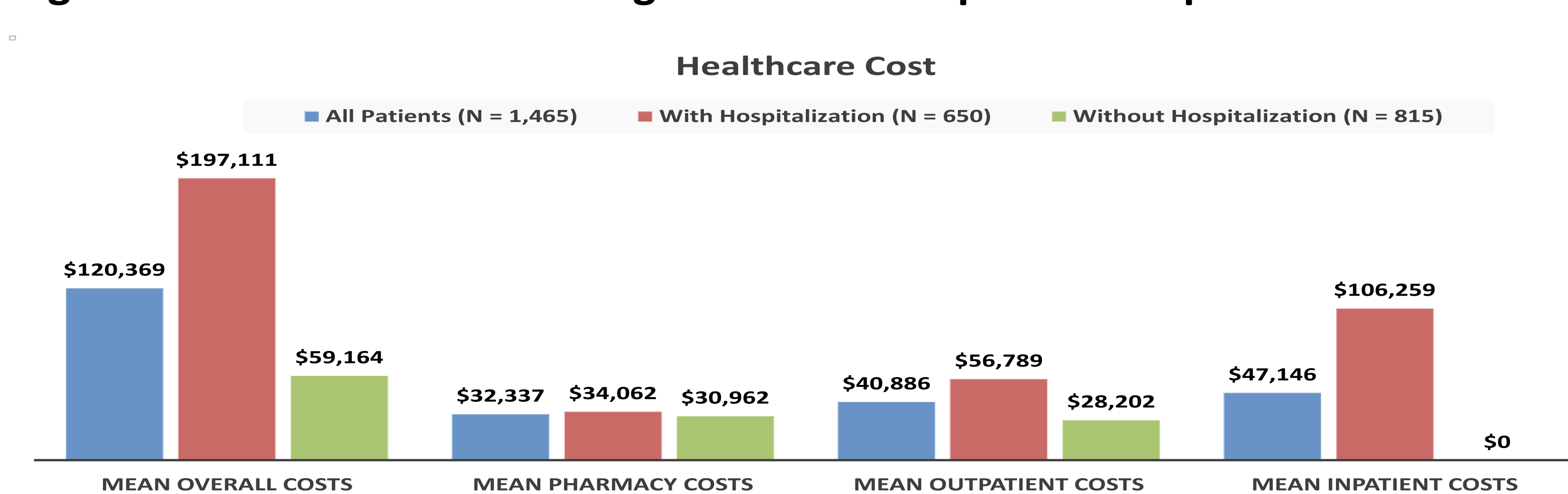
- At 12 months post-index, 66% of tadalafil patients did not experience treatment modification, compared with 56% of sildenafil patients. (p<0.0003, log-rank test)

Figure 3. Time To First PAH Related Hospitalization over the 12-month post-index period



- Over the 12-month post-index period, there was no difference in time to first hospitalization between tadalafil and sildenafil groups. (p<0.0895, log-rank test)

Figure 4. Healthcare cost during the 12-month post-index period



- The mean (SD) overall cost per patient was \$120,369 (\$189,365), inpatient \$47,146 (\$155,302), outpatient \$40,886 (\$81,802), and pharmacy \$32,337 (\$34,228).
- At least one hospitalization (all-cause) was experienced in 44.4% of the patients; their cost was \$197,111 (\$251,651) compared to \$59,164 (\$74,488) in patients with no hospitalization.

Table 2. Utilization of inpatient services among study population during the 12-month post-index period (N = 1,465)

Inpatient services	Mean/n	SD/%	Median
Hospital Admissions:			
Admissions among all patients	1.0	1.7	0
Patients with at least 1 admission	650	44.4%	
Admissions among those with at least 1 admission	2.2	1.9	2
Total days in hospital among those with at least 1 admission	20.4	34.9	9
Average length of stay among those with at least 1 admission	8.2	12.4	5

Conclusions

- PAH patients treated with PDE-5i monotherapy had a high probability of treatment modification and hospitalization within one year of starting therapy, resulting in substantial healthcare costs. The mean total admissions for those patients with at least one hospitalization and the total number of hospital days is consistent with what has been previously reported in the literature. These outcomes may indicate disease progression and highlight the need to achieve established treatment goals outlined in the 2015 ESC-European Society of Cardiology, ERS –European Respiratory Society PH Guidelines.

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