Demographics, Outcomes and Mortality Predictors of PCI versus CABG in Septuagenarians and Older Chronic Total Occlusion Patients: A Nationwide Inpatient Analysis

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Disclosures: None of the authors has any disclosures relevant to the content of the abstract.

Background

- There has always been a debate over superiority between Percutaneous Coronary Intervention (PCI) and Coronary Artery Bypass Grafting (CABG) for old-aged Chronic Total Occlusion (CTO) patients.
- The objective of our study was to compare the predictors of mortality and outcomes in CTO patients treated with PCI vs. CABG in ≥70-year-old patients.

Methods

- We queried the 2014 National Inpatient Sample (NIS) database for CTO using ICD-9 CM diagnostic code 414.2.
- Of these, ICD-9 CM procedure codes 36.01, 36.02, 36.05, 36.06, 36.07 and 36.09 were used for PCI whereas 00.66 was used to identify CABG.
- Using SPSS22, demographics and independent predictors were analyzed for ≥70-year-old patients using chi–square tests and a multiple logistic regression model.

Results

- We identified 22,620 (77.1%) and 6,700 (22.9%) weighted CTO patients treated with PCI vs. CABG in ≥70-year-old patients, respectively **(Table 1a).**
- Comparison of comorbidities and post-operative complications in CTO patients treated with PCI vs. CABG is shown in **figure 1.**
- Postop complications like cardiac (OR 3.37, CI 2.62- 4.33, p<0.001) and sepsis (OR 5.37, CI 4.10-7.10, p<0.001) were independent predictors of mortality in PCI; whereas, hemorrhage/hematoma (OR 4.12, CI 2.42-7.02, p<0.001), postop infections (OR 17.26, CI 5.17-57.66, p<0.001), and sepsis (OR 12.60, CI 7.44-21.33, p<0.001)were independent predictors of mortality in the CABG group (**Table 1b**).

Table 1a. Baseline Characteristics of the Chronic Total Occlusion Patients ≥70 years Treated with PCI versus CABG

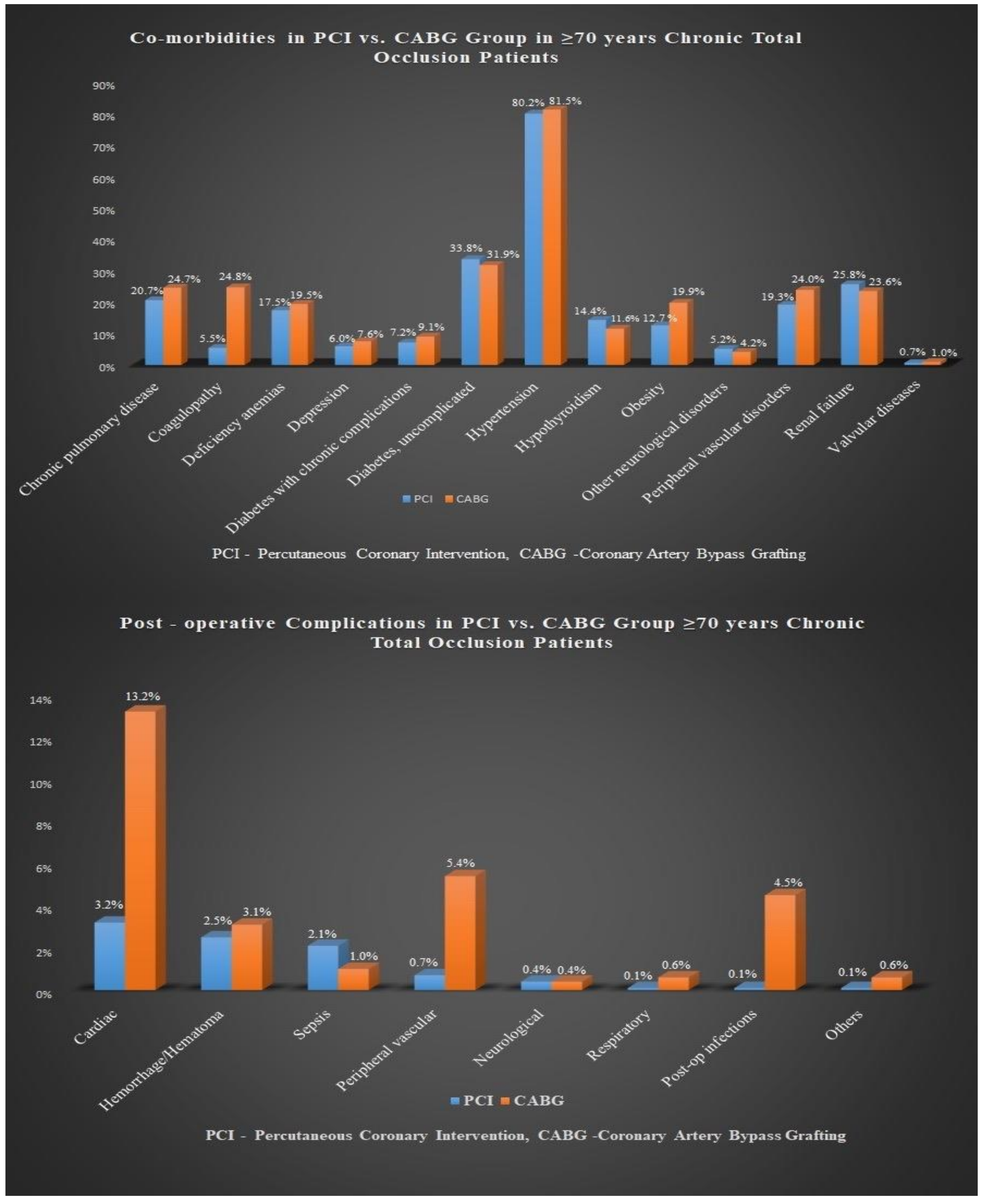
Variables	PCI	CABG	Overall	P-value*
Unweighted Index admission	4,524 (77.1%)	1,340 (22.9%)	5,864	
Weighted Index admission	22,620 (77.1%)	6,700 (22.9%)	29,320	
Age in years at admission				<0.001
70-75	41.3%	50.2%	43.3%	
76-80	26.9%	30.7%	27.8%	
81-85	18.9%	14.9%	18.0%	
86-90	13.0%	4.2%	10.9%	
Indicator of Sex				<0.001
Male	65.6%	76.3%	68.0%	
Female	34.4%	23.7%	32.0%	
Died	**5.6%**	**4.6%**	5.3%	0.001
Length of stay (cleaned)				<0.001
1 to 3 days	55.4%	1.9%	43.2%	
≥13 days	**6.7%**	**26.9%**	11.3%	

Table 1b. Multivariable Predictors of Mortality in Chronic Total Occlusion Patients ≥70 years Treated with PCI versus CABG

Predictors	PCI[a]			CABG[b]		
	Odds ratio	Confidence Interval (95%)	P-value*	Odds ratio	Confidence Interval (95%)	P-value*
Age 81-85 vs. <75 years	1.363	1.136-1.635	**0.001**	3.449	2.128-5.588	**<0.001**
Age 86-90 vs. <75 years	2.324	1.925-2.805	**<0.001**	23.100	13.019-40.986	**<0.001**
Weekend vs. Weekdays	1.338	1.149-1.557	**<0.001**	0.908	0.584-1.412	0.667
Female vs. Male	2.183	1.902-2.506	**<0.001**	3.199	2.246-4.556	**<0.001**
Hispanic vs. White	1.496	1.173-1.908	**0.001**	0.579	0.282-1.192	0.138
LOS ≥13 days vs. ≤3 days[$]	2.410	1.961-2.962	**<0.001**	0.003	0.001-0.006	<0.001
$1-$39, 999 vs. $66,000+[#]	1.782	1.446-2.196	**<0.001**	0.240	0.140-0.411	<0.001
Co – morbidities[c]						
Deficiency anemias	0.893	0.754-1.058	0.190	2.558	1.790-3.655	**<0.001**
Chronic pulmonary disease	1.215	1.035-1.425	**0.017**	1.342	0.921-1.957	0.126
Coagulopathy	3.435	2.821-4.184	**<0.001**	1.442	1.015-2.049	**0.041**
Diabetes, uncomplicated	1.143	0.438-0.811	**0.076**	1.699	0.605-2.219	**0.006**
Hypertension	0.509	0.438-0.592	<0.001	0.929	1.165-2.478	0.754
Fluid and electrolyte disorders	2.622	2.264-3.037	**<0.001**	0.124	0.588-1.470	1.820
Obesity	0.923	0.742-1.147	0.467	2.368	1.542-3.637	**<0.001**
Peripheral vascular disease	1.382	0.811-2.355	0.234	1.611	1.136-2.285	**0.007**
Renal failure	1.171	1.002-1.369	**0.048**	2.758	1.925-3.953	**<0.001**
Valvular diseases	1.867	0.925-3.766	0.081	17.819	5.076-62.552	**<0.001**
Post-operative Complications						
Cardiac	3.367	2.622-4.325	**<0.001**	0.660	0.390-1.116	0.121
Hemorrhage/Hematoma	0.961	0.660-1.400	0.836	4.121	2.418-7.024	**<0.001**
Postop infections	1.594	0.577-4.405	0.369	17.259	5.167-57.654	**<0.001**
Sepsis	5.373	4.093-7.054	**<0.001**	12.598	7.442-21.325	**<0.001**

*Significant P-values ≤0.05 at 95% confidence interval, [a]Percutaneous coronary intervention, [b]Coronary artery bypass grafting, [$]LOS=Length of Stay, [#]Median Household Income [c] AHRQ Co-morbidity measures

Figure 1. Comparison of comorbidities and postoperative complications in PCI vs. CABG Group ≥70 years CTO patients



Conclusion

- Overall mortality was higher in PCI group (5.6% vs. 4.6%) (p<0.001) and females (7.8% vs. 6.9%) (p<0.001). Strategic measures to minimize the postoperative complexities and mortality in septuagenarians and older CTO patients is imperative.