PUBLISHED ABSTRACT

Acute Coronary Events in Patients with Myeloproliferative Newoplasms – Nationwide Analysis of Patient Characteristics and in Hospital Outcomes

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Background

Myeloproliferative neoplasms (MPN) are characterized by clonal expansion of cells belonging to the erythroid and/or myeloid lineages. Concomitant platelet dysfunction and thrombocytosis predispose these patients to both arterial thromboses and bleeding, causing a high burden of morbidity and mortality. With advances in cancer therapeutics and improving survival, an increasing number of patients with MPN are presenting with acute coronary syndromes (ACS). However, data regarding in-hospital outcomes and revascularization strategies utilized in these patients is limited, due to lack of representation in trials and rarity of the disease.

Methods

We conducted a retrospective cohort study using the 2016 Nationwide Inpatient Sample (NIS), a large publicly available database in the United States. Adult patients with a primary diagnosis of ACS and a secondary diagnosis of MPN, including essential thrombocytosis, polycythemia vera, primary myelofibrosis or chronic myeloproliferative disorder,

Table 1: Results.

Parameter	ACS with MPN	ACS without MPN	Unadjusted OR	Adjusted OR	P value
Total patients (n = 677,304)	2,485	674,819			
Demographics					
Age (years)	67.9 (66.7–69.3)	66.9 (66.7–66.9)			P = 0.085
Female (%)	38.4 %	43.7%			P = 0.029
Ethnicity (%)					
White	74.79	73.98			P = 0.5
Black	12.5	11.5			
Hispanic	6.36	8.31			
Other	6.35	6.21			
Clinical features					
Hypertension (%)	81.09	80.43			P = 0.71
Chronic kidney disease (%)	21.33	23.33			P = 0.288
Diabetes Mellitus (%)	29.8	38.92			P < 0.001
Heart failure (%)	36.62	27.17			P < 0.001
Smokers (%)	49.9	45.42			P = 0.052

(Contd.)

Parameter	ACS with MPN	ACS without MPN	Unadjusted OR	Adjusted OR	P value
Obesity (%)	13.1	15.1			P = 0.21
PAD (%)	20.1	20.3			P = 0.98
Charlson Comorbidity Index (mean)	1.54	1.47			P = 0.07
Outcomes					
In-hospital Mortality (%)	5.83	4.57	1.29 (0.87–1.9)	1.12 (0.73–1.71)	P = 0.59
PCI for revascularization (%)	38.43	46.02	0.73 (0.61–0.87)	0.76 (0.63–0.93)	P = 0.01
CABG for revascularization (%)	12.45	8.75	1.54 (1.17–2.02)	1.47 (1.11–1.96)	P = 0.007
Acute pulmonary emboli (%)	1.41	0.55	2.55 (1.21–5.35)	2.31 (1.09–4.89)	P = 0.027
Cardiogenic shock (%)	7.04	3.26	2.24 (1.60–3.13)	1.54 (1.14–2.08)	P = 0.004
Acute kidney injury (%)	24.29	18.63	1.40 (1.14–1.71)	1.36 (1.08-1.73)	P = 0.009
Length of stay (days)	6.9 ± 0.027	4.3 ± 0.31			P < 0.001
Hospitalization total cost (×1,000 USD)	121.7 ± 14.1	88.1 ± 77.2			P < 0.001

were identified using the International Classification of Diseases (ICD) 10th Revision codes. Main outcomes of interest such as in-hospital mortality, utilization of revascularization strategy and in-hospital complications, were compared between the patients with ACS and comorbid MPN and those without MPN, using a multivariate logistic regression model. Length of stay and total cost of hospitalization was also compared between cohorts.

Results

Out of 677,304 patients admitted for ACS, 2,485 (0.37%) patients also had a secondary diagnosis of MPN. Patients with MPN were less frequently female and diabetic but were more likely to have heart failure. No statistical difference in race, smoking, obesity or peripheral arterial disease (PAD) was noted between the two cohorts. Also, there was no significant difference in the in-hospital mortality in ACS patients with or without MPN (5.83% vs 4.57% respectively, p = 0.59). In terms of revascularization, patients with MPN were less likely to undergo percutaneous coronary intervention (PCI), (adjusted odds ratio [aOR] 0.76, p = 0.01) and more likely to undergo coronary arterial bypass grafting (CABG), (aOR: 1.47, p = 0.007). In addition, patients with MPN had a higher risk of acute pulmonary embolism (aOR 2.31, p = 0.027), cardiogenic shock (aOR 1.54, p = 0.004), and acute kidney injury (aOR 1.36, 95% CI, p = 0.009) as well as increased length of stay and hospitalization costs (**Table 1**).

Conclusion

In patients presenting with ACS and concomitant MPN, CABG was the preferred mode of revascularization over PCI, which might explain the longer length of stay and increased hospitalization cost. Although the in-hospital mortality was similar between the two groups, patients with MPN had higher risks of complications including pulmonary emboli, and cardiogenic shock.

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