Outcomes of Contemporary PCI in Nonagenarians: Insights from Blue Cross Blue Shield of Michigan Cardiovascular Consortium

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ABSTRACT

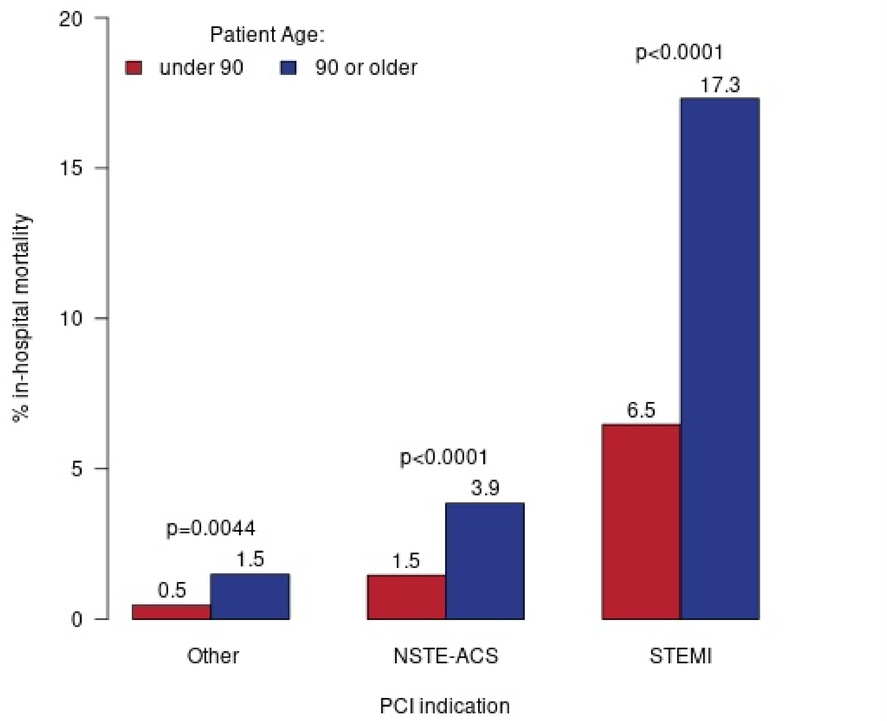
Background: Coronary artery disease remains a leading cause of death in the number of older patients undergoing PCI.

Methods: We evaluated the outcomes of PCI performed in 114,464 patients from 2018 to 2022 in 48 participating hospitals in the Blue Cross Blue Shield Cardiovascular Consortium.

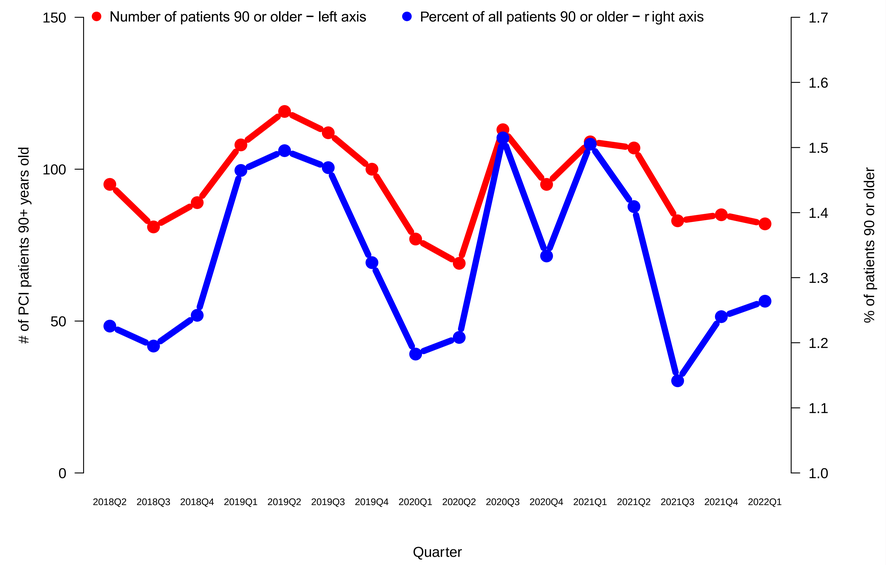
Results: There were 1524 patients aged ≥ 90 years with a mean age of 91.9 years (+/- 1.98). Acute coronary syndrome as the PCI indication was more common among patients ≥ 90 years compared with younger patients (64.6% versus 56.3%, p < 0.001). Nonagenarians had fewer complex (type C) treated lesions and fewer treated chronic total occlusion lesions (3.61% versus 2.22%, p = 0.0007). They were more likely to have cardiovascular instability at the time of PCI, post-procedure cardiogenic shock (3.3% versus 1.6%, p < 0.001), greater use of mechanical support (5.12% versus 3.6%, p = 0.003), and lower rates of technical and procedural success. Body Mass Index decreased with age and was significantly lower in nonagenarians (26.2 versus 30.8, p < 0.001). Mortality was significantly higher in patients ≥ 90 years (5.5% versus 1.8%, p < 0.001), as was acute kidney injury (6.6% versus 2.7%, p < 0.001).

OBJECTIVE

Assess current trends in post procedural outcomes by age in a statewide registry.



Figures: (above) Mortality by age group based on indication for PCI; (below) Trends in the the number and percent of PCIs performed in patients > 90 years by quarter



METHODS

A retrospective review of the outcomes of patients undergoing PCI within the Blue Cross Blue Shield of Michigan Cardiovascular Consortium was performed. A linear regression model was used to assess trend in age by year. Specific in-hospital post-PCI outcomes were assessed by age.

RESULTS

- Mortality was significantly higher in patients ≥ 90 years of age (5.5% versus 1.8%, p < 0.001). They had higher rates of cardiovascular instability and use of mechanical support.
- In addition to lower rates of technical and procedural success, patients aged ≥ 90 years also had more acute kidney injury (6.6% vs. 2.7%, p < 0.001). This was despite the use of lower contrast volume (123.6ml versus 141.2ml, p < 0.001) and similar baseline creatinine (1.25mg/dl versus 1.24mg/dl, p < 0.001). New dialysis initiation was similar between groups (0.3% versus 0.4%, p < 0.001).
- Patients ≥ 90 years were also more likely to have post procedure heart failure (4.4% versus 2%, p < 0.001), access site bleeding (1% versus 0.3%, p < 0.001), and hematomas (2.1% versus 0.6%, p < 0.001).
- Over 55% of patients ≥ 90 years were at least mildly frail on the Canadian Study of Health and Aging (CSHA) Clinical Frailty Scale, with 14% of patients classifying as severely frail, very severely frail, or terminally ill.

CONCLUSIONS

Nearly 400 patients ≥ 90 years old undergo PCI in Michigan every year. Despite improvements in PCI safety and technique, nonagenarians experience significantly higher mortality than patients < 90 years old.