

Differences in 30-Day Readmission Rates in Older Adults With Dementia

Park DY, Hu JR, Alexander KP, Nanna MG. Readmission and adverse outcomes after percutaneous coronary intervention in patients with dementia. *J Am Geriatr Soc.* 2023;71(4):1034-1046. doi:10.1111/jgs.18120

Gilmore-Bykovskyi A, Zuelsdorff M, Block L, et al. Disparities in 30-day readmission rates among Medicare enrollees with dementia. *J Am Geriatr Soc.* 2023 Mar 10. doi:10.1111/jgs.18311

Study 1 Overview (Park et al)

Objective: To compare rates of adverse events and 30-day readmission among patients with dementia who undergo percutaneous coronary intervention (PCI) with those without dementia.

Design: This cohort study used a national database of hospital readmissions developed by the Agency for Healthcare Research and Quality.

Setting and participants: Data from State Inpatient Databases were used to derive this national readmissions database representing 80% of hospitals from 28 states that contribute data. The study included all individuals aged 18 years and older who were identified to have had a PCI procedure in the years 2017 and 2018. *International Classification of Diseases, Tenth Revision* (ICD-10) codes were used to identify PCI procedures, including drug-eluting stent placement, bare-metal stent placement, and balloon angioplasty, performed in patients who presented with myocardial infarction and unstable angina and those with stable ischemic heart disease. Patients were stratified into those with or without dementia, also defined using ICD-10 codes. A total of 755,406 index hospitalizations were included; 2.3% of the patients had dementia.

Main outcome measures: The primary study outcome was 30-day all-cause readmission, with the cause classified as cardiovascular or noncardiovascular. Secondary outcome measures examined were delirium, in-hospital mortality, cardiac arrest, blood transfusion, acute kidney injury, fall in hospital, length of hospital stay, and other adverse outcomes. Location at discharge was also examined. Other covariates included in the analysis were age, sex, comorbidities, hospital characteristics, primary

payer, and median income. For analysis, a propensity score matching algorithm was applied to match patients with and without dementia. Kaplan-Meier curves were used to examine 30-day readmission rates, and a Cox proportional hazards model was used to calculate hazard ratios (HR) for those with and without dementia. For secondary outcomes, logistic regression models were used to calculate odds ratios (OR) of outcomes between those with and without dementia.

Main results: The average age of those with dementia was 78.8 years vs 64.9 years in those without dementia. Women made up 42.8% of those with dementia and 31.3% of those without dementia. Those with dementia also had higher rates of comorbidities, such as heart failure, renal failure, and depression. After propensity score matching, 17,309 and 17,187 patients with and without dementia, respectively, were included. Covariates were balanced between the 2 groups after matching. For the primary outcome, patients with dementia were more likely to be readmitted at 30 days (HR, 1.11; 95% CI, 1.05-1.18; $P < .01$) when compared to those without dementia. For other adverse outcomes, delirium was significantly more likely to occur for those with dementia (OR, 4.37; 95% CI, 3.69-5.16; $P < .01$). Patients with dementia were also more likely to die in hospital (OR, 1.15; 95% CI, 1.01-1.30; $P = .03$), have cardiac arrest (OR, 1.19; 95% CI, 1.01-1.39; $P = .04$), receive a blood transfusion (OR, 1.17; 95% CI, 1.00-1.36; $P = .05$), experience acute kidney injury (OR, 1.30; 95% CI, 1.21-1.39; $P < .01$), and fall in hospital (OR, 2.51; 95% CI, 2.06-3.07; $P < .01$). Hospital length of stay was higher for those with dementia, with a mean difference of 1.43 days. For discharge location, patients with dementia were more likely to be sent to a skilled nursing

facility (30.1% vs 12.2%) and less likely to be discharged home.

Conclusion: Patients with dementia are more likely to experience adverse events, including delirium, mortality, kidney injury, and falls after PCI, and are more likely to be readmitted to the hospital in 30 days compared to those without dementia.

Study 2 Overview (Gilmore-Bykovskyi et al)

Objective: To examine the association between race and 30-day readmissions in Black and non-Hispanic White Medicare beneficiaries with dementia.

Design: This was a retrospective cohort study that used 100% Medicare fee-for service claims data from all hospitalizations between January 1, 2014, and November 30, 2014, for all enrollees with a dementia diagnosis. The claims data were linked to the patient, hospital stay, and hospital factors. Patients with dementia were identified using a validated algorithm that requires an inpatient, skilled nursing facility, home health, or Part B institutional or noninstitutional claim with a qualifying diagnostic code during a 3-year period. Persons enrolled in a health maintenance organization plan were excluded.

Main outcome measures: The primary outcome examined in this study was 30-day all-cause readmission. Self-reported race and ethnic identity was a baseline covariate. Persons who self-reported Black or non-Hispanic White race were included in the study; other categories of race and ethnicity were excluded because of prior evidence suggesting low accuracy of these categories in Medicare claims data. Other covariates included neighborhood disadvantage, measured using the Area Deprivation Index (ADI), and rurality; hospital-level and hospital stay-level characteristics such as for-profit status and number of annual discharges; and individual demographic characteristics and comorbidities. The ADI is constructed using variables of poverty, education, housing, and employment and is represented as a percentile ranking of level of disadvantage. Unadjusted and adjusted analyses of 30-day hospital readmission were conducted. Models using various levels of adjustment were constructed to examine the contributions of the identified covariates to the estimated association between 30-day readmission and race.

Main results: A total of 1,523,142 index hospital stays among 945,481 beneficiaries were included; 215,815 episodes were among Black beneficiaries and 1,307,327 episodes were among non-Hispanic White beneficiaries. Mean age was 81.5 years, and approximately 61% of beneficiaries were female. Black beneficiaries were younger but had higher rates of dual Medicare/Medicaid eligibility and disability; they were also more likely to reside in disadvantaged neighborhoods. Black beneficiaries had a 30-day readmission rate of 24.1% compared with 18.5% in non-Hispanic White beneficiaries (unadjusted OR, 1.37; 95% CI, 1.35-1.39). The differences in outcomes persisted after adjusting for geographic factors, social factors, hospital characteristics, hospital stay factors, demographics, and comorbidities, suggesting that unmeasured underlying racial disparities not included in this model accounted for the differences. The effects of certain variables, such as neighborhood, differed by race; for example, the protective effect of living in a less disadvantaged neighborhood was observed among White beneficiaries but not Black beneficiaries.

Conclusion: Racial and geographic disparities in 30-day readmission rates were observed among Medicare beneficiaries with dementia. Protective effects associated with neighborhood advantage may confer different levels of benefit for people of different race.

Commentary

Adults living with dementia are at higher risk of adverse outcomes across settings. In the first study, by Park et al, among adults who underwent a cardiac procedure (PCI), those with dementia were more likely to experience adverse events compared to those without dementia. These outcomes include increased rates of 30-day readmissions, delirium, cardiac arrest, and falls. These findings are consistent with other studies that found a similar association among patients who underwent other cardiac procedures, such as transcatheter aortic valve replacement.¹ Because dementia is a strong predisposing factor for delirium, it is not surprising that delirium is observed across patients who underwent different procedures or hospitalization episodes.² Because of the potential hazards for inpatients with dementia, hospitals have developed risk-reduction programs, such as those

that promote recognition of dementia, and management strategies that reduce the risk of delirium.³ Delirium prevention may also impact other adverse outcomes, such as falls, discharge to institutional care, and readmissions.

Racial disparities in care outcomes have been documented across settings, including hospital⁴ and hospice care settings.⁵ In study 2, by Gilmore-Bykovskyi et al, the findings of higher rates of hospital readmission among Black patients when compared to non-Hispanic White patients were not surprising. The central finding of this study is that even when accounting for various levels of factors, including hospital-level, hospital stay-level, individual (demographics, comorbidities), and neighborhood characteristics (disadvantage), the observed disparity diminished but persisted, suggesting that while these various levels of factors contributed to the observed disparity, other unmeasured factors also contributed. Another key finding is that the effect of the various factors examined in this study may affect different subgroups in different ways, suggesting underlying factors, and thus potential solutions to reduce disparities in care outcomes, could differ among subgroups.

Applications for Clinical Practice and System Implementation

These 2 studies add to the literature on factors that can affect 30-day hospital readmission rates in patients with dementia. These data could allow for more robust discussions of what to anticipate when adults with dementia undergo specific procedures, and also further build the case that improvements in care, such as delirium prevention programs, could offer benefits. The observation about racial and ethnic disparities in care outcomes among patients with dementia highlights the continued

need to better understand the drivers of these disparities so that hospital systems and policy makers can consider and test possible solutions. Future studies should further disentangle the relationships among the various levels of factors and observed disparities in outcomes, especially for this vulnerable population of adults living with dementia.

Practice Points

- Clinicians should be aware of the additional risks for poor outcomes that dementia confers.
- Awareness of this increased risk will inform discussions of risks and benefits for older adults considered for procedures.

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