Clinical Characteristics and Outcomes of Patients with Sickle cell Anemia and Myocardial Infarction: A case-Control Study

Introduction:

Sickle cell disease (SCD) affects millions worldwide. Sickle cell anemia (SCA), the most severe form of this disease, is also the most common inherited blood disorder in the United States. About one in every 500-600 African Americans suffer from this disease. There is however limited data on the incidence, clinical characteristics and in-hospital outcomes of myocardial infarction in these patients. This study describes the occurrence and case-control-matched outcomes of adult patients with SCA diagnosed with myocardial infarction (MI) in the United States over a 16 year period.

Methods

Using ICD 9 DM codes and unweighted data from the National Inpatient Sample database, we identified patients with an ICD 9 DM diagnoses of MI and sickle cell anemia between 1998 and 2013. We matched cases (SCA) with controls (no SCA) by age, gender, race and type of MI (ST-Elevation vs. Non ST Elevation). We compared both groups in terms of clinical characteristics and in-patient outcomes. We also performed logistic regression with mortality as primary outcome. Using weighted samples, we also described trends of SCA in the general population of patients with MI.

Results

Of the 3,203,937 reported observations of MI, SCA was reported in 605 (.02%) patients. All 605 patients with SCA were included in the case-control matched analysis. The median age was 47 (IQR 22) and 54.2% (n=328) were female. Patients with SCA were younger and likely to be black (p<.001). Patients with SCA were more likely to have congestive heart failure, chronic kidney disease, atrial fibrillation and pulmonary hypertension. They were however less likely to suffer from many of the typical risk factors for CAD and acute coronary syndrome (ACS).

Patients with SCA were more likely to suffer cardiac arrest (8.1 vs. 4.1, p=.004). They were also more likely to developed pneumonia (22.5% vs. 8.4%), respiratory failure (31.2% vs. 17%), acute renal failure (27.4% vs.14.5%) and require intubation/mechanical ventilation (26.1% vs 13.6%), dialysis for acute renal failure (6.8% vs. 2.8%) and blood transfusion (39.5 vs 7.3%) (p<.001 for all interactions). Patients with SCA also had a longer hospital stay (median length of stay 6 (IQR 8) days vs 4 (IQR 6) days, p<.001. The incidence of mortality was statistically higher in patients with SCA (18.7% vs 8.1%, p<.001). There continued to be a significantly higher mortality among these patients when stratified by type of MI (38.3% vs 12.0% in STEMI, p<.001 and 11.2% vs 6.6%, p=.018 in NSTEMI).

Conclusion:

Myocardial infarction occurs in patients with sickle cell anemia at a relatively early age. These patients do not typically have the traditional risk factors for acute coronary syndrome. Mortality in these patients is significantly higher in age gender and race-matched controls regardless of the type of myocardial infarction. Sickle cell anemia is associated with increased odds for mortality. Special attention should be
paid to these patients if there is clinical suspicion for acute coronary syndrome, as they appear to have a different etiopathogenesis, clinical characteristics and presentation.

References:
