

Control Number: 65

Abstract Category: Clinical Science in Cardio-Oncology

Title: FFR cost-effectively reduces mortality based upon malignancy type: Propensity score and machine learning supported nationally representative case-control study of over 30 million+ hospitalizations.

ABSTRACT BODY

Background

Although there is an increased number of patients with concomitant coronary artery disease, and cancer limited data exist on functional assessment of flow in this high risk population. There are no nationally representative studies of mortality and cost effectiveness for fractional flow reserve (FFR) guided percutaneous coronary interventions (PCI) and cancer. Our study aims to show the benefit FFR can play in identifying patients that could benefit from PCI.

Methods

Propensity score matched analysis and backward propagation neural network machine learning supported multivariable regression was performed for mortality in this case-control study of the 2016 National Inpatient Sample (NIS), the nation's largest all-payer hospitalized dataset. Regression results were fully adjusted for age, race, income, geographic region, metastases, and mortality risk, and the likelihood of undergoing FFR versus non-FFR PCI. All analyses were adjusted for the complex survey design to produce nationally representative estimates. Cost effectiveness analysis was performed according to the Centers for Disease Control and Prevention (CDC) method.

Results

Of the 30,195,722 hospitalized patients meeting criteria 3.37% of the PCIs performed included FFR. In propensity score adjusted multivariable regression controlling for, FFR versus non-FFR PCI significantly reduced inpatient mortality (OR 0.47, 95%CI 0.35-0.63; $p<0.001$) and length of stay (in days; beta -0.23, 95%CI -0.37- -0.09; $p=0.001$) while increasing cost (in USD; beta \$5,708.63, 95%CI 3,042.70-8,374.57; $p<0.001$), without significantly increasing complications overall or for cancer patients. FFR versus non-FFR PCI did not specifically change cancer patients' mortality, LOS, or cost. The only cancers for which FFR versus non-FFR PCI significantly reduced mortality was for Hodgkin's lymphoma (OR 52.48, 95%CI 7.16-384.53; $p<0.001$) and rectal cancer (OR 24.38, 95%CI 2.24-265.73; $p=0.009$).

Conclusion

Our study suggests that FFR may have additive benefit to reduce inpatient mortality and length of stay in Hodgkin's lymphoma and rectal cancer patients. However, further studies are needed to identify cardio-oncology patients where coronary flow assessment and PCI can have value.

Clinical Implications

FFR when utilized can benefit in patients with selected cancers.