What is the prognostic implication of right bundle branch block in asymptomatic coronary artery disease patients?

Evidence-Based Answer

In patients with asymptomatic coronary artery disease (CAD), complete right bundle branch block (RBBB) likely increases mortality risk compared with similar patients without complete RBBB. (SOR: B, based on 3 cohort studies with heterogeneous results.) Incomplete RBBB in patients with CAD does not affect mortality risk. (SOR: B, based on 1 cohort study.)

In 1 prospective cohort study, 7,073 patients with known or suspected CAD were referred for exercise treadmill stress testing with thallium imaging. These patients were evaluated for the presence or absence of bundle branch block (BBB), and followed for a mean of 6.7±1.6 years. The primary endpoint was all-cause mortality. Patients were excluded if they had valvular or congenital heart disease, congestive heart failure, pre-excitation syndrome, or a pacemaker. The mean age of patients without RBBB was 60±11 years, and of those with RBBB was 66±9 years. One hundred ninety patients (3%) had complete RBBB and 305 (4%) had incomplete RBBB.

The overall mortality of patients without complete RBBB or left bundle branch block (LBBB) was 11%. For patients with incomplete RBBB, mortality was 10%. Complete RBBB was associated with a 24% mortality rate (HR 1.5; 95% CI, 1.1–2.1; \( P = .007 \)), and was as strong a predictor of mortality as complete LBBB (24% mortality; HR 1.5; 95% CI, 1.1–2.0; \( P = .017 \)).

Another cohort study of 15,609 patients with known CAD undergoing coronary and left ventricular angiography identified 272 (1.7%) with RBBB. The aim of this study was to determine if BBB was an independent risk factor for mortality. Exclusion criteria included valvular heart disease, nonischemic cardiomyopathy, or congenital heart disease, and the average age of all patients was 54±9 years. Those who qualified were followed for a mean of 4.9±1.3 years, with the endpoint being all-cause mortality.

The presence of RBBB in a patient with known CAD increased the mortality rate above that of patients with CAD but without BBB (26% vs 15%, respectively; \( P < .0001 \)). Unlike the aforementioned cohort study, the mortality increase with LBBB was larger than that associated with complete RBBB (58% vs 26%; \( P < .0001 \)).

In a third prospective cohort study, 9,541 patients who had known asymptomatic CAD were evaluated for the presence or absence of BBB, then followed for a median of 4.5 years. The primary endpoint of the study was major cardiovascular events, but patients were also evaluated for all-cause mortality. Exclusion criteria included heart failure or known left ventricular dysfunction, uncontrolled hypertension, significant valvular disease, renal disease, and major noncardiac illness. The mean age of patients was 65.9±7 years, for both those with and without RBBB.

Mortality rates were higher in patients with RBBB versus those without, but unlike the other 2 studies, the difference was small and not statistically significant (13.8% vs 11.1%; 95% CI, 0.80–1.35).

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GLOSSARY

ARR=absolute risk reduction
CDC=Centers for Disease Control and Prevention
CI=confidence interval
CT=computed tomography
FDA=US Food and Drug Administration
HR=hazard ratio
LOE=level of evidence
MRI=magnetic resonance imaging
NNH=number needed to harm
NNT=number needed to treat
OR=odds ratio
RCT=randomized controlled trial
RR=relative risk
SOR=strength of recommendation