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Research Letter

Ischemic Evaluation and Revascularization in Patients Presenting With Advanced Atrioventricular Block Without Concomitant Acute Myocardial Infarction

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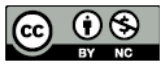

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Ischemic heart disease is an established risk factor for advanced (second-degree [Mobitz type II] and third-degree) atrioventricular (AV) block. Current guidelines recommend ischemic evaluation as part of the workup for potential reversible causes of advanced AV block.[1] Although AV block in the setting of acute myocardial infarction (AMI) is often reversible, however, data are limited on the utility of ischemic evaluation in AV block not in the setting of AMI and whether AV block associated with chronic coronary artery disease (CAD) is reversible after revascularization.[2,3] The goal of this study was to assess the practice pattern of ischemic evaluation among patients who presented at a large county hospital with advanced AV block without AMI and to evaluate whether revascularization was associated with reversibility of AV block.

Electronic health records were queried for patients aged 18 years or older with diagnosed third-degree or second-degree (Mobitz type II) AV block between January 1, 2018, and January 1, 2022. Patients who presented with AMI were excluded. The study was approved by the affiliated institutional review board. Demographic data, medical history, and procedural detail related to ischemic evaluation, including coronary angiography and noninvasive imaging (stress testing and cardiac computer tomographic angiography) as well as coronary revascularization if performed and pacemaker device interrogation data, were abstracted. The exposure variable was revascularization within 3 months of presentation for AV block. The outcome variables included the percentage of ventricular pacing burden, ventricular pacing burden above 40%, and reversibility of AV block on the last device interrogation. We defined *reversibility* as 1% or lower ventricular pacing at the last 2 device interrogations, which was then confirmed by the latest electrocardiogram. If no pacemaker was implanted, the available electrocardiograms and Holter monitor data were reviewed after the initial presentation. Basic characteristics were compared between presence vs absence of ischemic evaluation using the *t* test and χ^2 test. Multivariable regression analysis was then performed to assess the association of revascularization, age at diagnosis, sex, presence of third-degree AV block, hypertension, diabetes, left ventricular ejection fraction, body mass index, and maximum follow-up time with outcome variables.

Over 4 years, 116 patients presented with advanced AV block without concomitant AMI, of whom 73 (62.9%) underwent ischemic evaluation (49 patients received selective coronary angiography, and 24 patients underwent stress testing). Of those who underwent ischemic evaluation, 21 (28.8%) had obstructive CAD on coronary angiography. Among patients with obstructive CAD, 66.7% had right coronary artery disease, 47.6% had multivessel

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disease, and 85.7% underwent either percutaneous or surgical revascularization. Basic characteristics of individuals with and without revascularization are presented in Table I. Those who underwent revascularization had a mean ventricular pacing burden on the last 2 device checks of 89.8%. Ventricular pacing above 40% was noted in 93.8% of those who underwent revascularization, and AV block resolved in 11.1% of revascularized patients. In regression analysis, coronary revascularization was not significantly associated with ventricular pacing burden percentage (β = 8.63 [95% CI, –12.20 to 29.46]), ventricular pacing above 40% (odds ratio, 8.10 [95% CI, 0.46-143.63]), or resolution of AV block (odds ratio, 0.37 [95% CI, 0.03-4.35]).

In this study, although a majority of patients with advanced AV block without AMI underwent ischemic evaluation, less than one-third were found to have obstructive CAD. Among those with obstructive disease, revascularization did not appear to be associated with resolution of the conduction disease or lower pacing burden. These findings are similar to those of prior studies of advanced AV block in the setting of chronic ischemic heart disease.[2,3] In these patients, permanent damage to the conduction system has likely occurred because of stenosis with the epicardial artery and also disease at the microvascular level. This study's findings carry clinical implications, suggesting that although ischemic evaluation should be undertaken in patients presenting with advanced AV block if CAD is suspected, it does not need to precede pacemaker placement, given unlikely resolution of AV block with revascularization in a non-AMI setting. Limitations to this study include its small sample size and retrospective,

Abbreviations and Acronyms

AMI	acute myocardial infarction
AV	atrioventricular
CAD	coronary artery disease

TABLE I. Study Characteristics of Patients Presenting With Advanced Atrioventricular Block, Tabulated by Revascularization Status

Characteristic	Total (N = 116)	Revascularization (n = 18)	No revascularization (n = 98)	*P* value[a]
Age at diagnosis, mean (SD), y	61.0 (14.61)	63.2 (11.17)	60.6 (15.17)	.50
Male sex, %	44.8	44.4	44.9	.97
Hypertension, %	62.0	66.7	66.1	.65
Diabetes, %	35.5	50.0	33.0	.19
Body mass index, mean (SD)[b]	29.9 (7.13)	28.5 (3.94)	30.2 (7.50)	.42
Left ventricular ejection fraction, mean (SD), %	57.2 (12.41)	59.6 (14.59)	57.2 (11.82)	.94
Third-degree atrioventricular block, %	82.8	72.2	84.7	.20
Permanent pacemaker, %	89.7	83.3	90.8	.34
Follow-up time, mean (SD), mo	53.7 (89.03)	26.5 (32.31)	58.8 (95.25)	.17
Ventricular pacing on last interrogation, mean (SD), %	82.4 (33.42)	89.8 (25.45)	81.1 (34.60)	.34
Ventricular pacing >40% on last interrogation, %	82.1	93.8	80.0	.19
Atrioventricular block resolution, %	10.4	11.1	10.3	.92

[a] $P < .05$ was considered statistically significant.

[b] Calculated as weight in kilograms divided by height in meters squared.

observational design. Larger studies are warranted to confirm these findings, which suggest that advanced AV block in those without concomitant AMI is not likely to be reversible with revascularization.

Article Information

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