

Complete RBBB and Subclinical Coronary Atherosclerosis in Asymptomatic Individuals

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Background/Aims: Limited data exist regarding the association between complete right bundle branch block (CRBBB) and subclinical coronary atherosclerosis. This study investigated the influence of CRBBB on subclinical coronary atherosclerosis detected by coronary computed tomographic angiography (CCTA) in an asymptomatic population.

Methods: We retrospectively analyzed 7,205 asymptomatic individuals (mean age 54.4 ± 7.9 years and 4,695 men [65.2%]) with no prior history of coronary artery disease who voluntarily underwent CCTA and 12-lead electrocardiography evaluation as part of a general health examination. The degree and extent of subclinical coronary atherosclerosis were evaluated by CCTA, and $\geq 50\%$ diameter stenosis was defined as significant. The association between CRBBB and subclinical coronary atherosclerosis was determined by logistic regression and propensity score matching analyses.

Results: Of study participants, 116 (1.6%) had CRBBB. After adjustment for cardiovascular risk factors, there were no statistically significant differences in the adjusted odds ratios of CRBBB for any atherosclerotic plaque (0.87, 95% confidence interval [CI] 0.57-1.32), calcified plaque (0.78, 95% CI 0.51-1.19), non-calcified plaque (1.44, 95% CI 0.77-2.69), mixed plaque (1.12, 95% CI 0.52-2.39), and significant coronary artery stenosis (0.92, 95% CI 0.48-1.74). Similarly, in the 5:1 propensity-score matched population (n=696), there were no statistically significant differences in the odds ratios for any subclinical coronary atherosclerosis between participants with and without CRBBB (P for all >0.05).

Conclusions: In this large cross-sectional study of asymptomatic individuals undergoing CCTA and electrocardiography evaluation, individuals with CRBBB were not associated with an increased risk of subclinical coronary atherosclerosis compared with those without CRBBB.

Figure 1

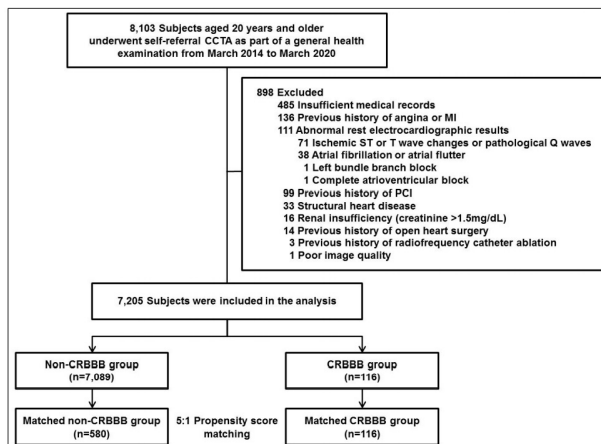


Table 1. Baseline characteristics of individuals with and without CRBBB

Characteristics	Overall population (n=7,205)		Propensity score matched population (n=696)	
	Non-CRBBB (n=7,089)	CRBBB (n=116)	Non-CRBBB (n=580)	CRBBB (n=116)
Age, years	54.2 ± 7.9	57.5 ± 8.7	56.1 ± 8.1	57.9 ± 8.7
Male sex, no. (%)	4,598 (64.9)	97 (83.6)	476 (82.1)	97 (83.6)
Body mass index, kg/m ²	24.2 ± 3.0	24.4 ± 2.9	24.1 ± 2.7	24.4 ± 2.9
Waist circumference, cm	85.7 ± 7.8	87.6 ± 7.9	86.3 ± 7.3	87.6 ± 7.9
Systolic blood pressure, mmHg	126.6 ± 13.1	128.3 ± 12.5	128.6 ± 12.8	128.3 ± 12.5
Diastolic blood pressure, mmHg	78.9 ± 9.3	79.8 ± 8.5	79.0 ± 9.0	79.8 ± 8.5
Diabetes mellitus, no. (%)	930 (13.1)	23 (19.8)	914 (15.5)	23 (19.8)
Hypertension, no. (%)	2,422 (34.2)	51 (43.7)	242 (41.7)	51 (43.7)
Hyperlipidemia, no. (%)	1,176 (16.6)	22 (19.0)	106 (18.3)	22 (19.0)
Current smoker, no. (%)	1,435 (20.3)	30 (26.1)	137 (23.6)	30 (26.1)
Obesity, no. (%)	2,596 (36.8)	46 (39.7)	254 (43.8)	46 (39.7)
Family history of coronary artery disease, no. (%)	602 (8.5)	12 (10.3)	60 (10.3)	12 (10.3)
Fasting blood glucose, mg/dL	98.8 ± 23.9	101.3 ± 25.9	100.7 ± 26.5	101.3 ± 25.9
Glucose tolerance, %	5.7 ± 0.8	5.8 ± 0.9	5.8 ± 0.8	5.8 ± 0.9
Total cholesterol, mg/dL	190.1 ± 36.8	185.4 ± 39.0	185.2 ± 39.6	185.4 ± 39.0
Low-density lipoprotein cholesterol, mg/dL	129.7 ± 34.6	128.4 ± 36.0	128.6 ± 37.2	128.4 ± 36.0
High-density lipoprotein cholesterol, mg/dL	53.2 ± 13.1	50.7 ± 14.2	51.3 ± 13.7	50.7 ± 14.2
Triglyceride, mg/dL	174.8 ± 78.7	124.6 ± 56.1	123.6 ± 62.3	124.6 ± 56.1
Creatinine, mg/dL	0.8 ± 0.2	0.9 ± 0.2	0.9 ± 0.2	0.9 ± 0.2
Uric acid, mg/dL	5.3 ± 1.3	5.6 ± 1.3	5.6 ± 1.4	5.6 ± 1.3
C-reactive protein (log/L), no. (%)	41 (0.6)	2 (1.7)	4 (0.7)	2 (1.7)
Ejection fraction, %	65.8 ± 4.3	65.7 ± 3.4	65.6 ± 4.3	65.7 ± 3.4
Framingham risk score	8.2 ± 5.8	11.1 ± 6.8	10.9 ± 6.8	11.0 ± 6.8

Values are shown as mean ± standard deviation or number (%).

CRBBB = complete right bundle branch block.

*Coronary artery disease in a first-degree relative of any age.

Table 2. Comparison of coronary computed tomography angiographic findings between individuals with and without CRBBB

Variables	Overall	Non-CRBBB (n=7,089)	CRBBB (n=116)
Mean coronary artery calcium score	42.0 ± 162.0	41.0 ± 160.1	97.9 ± 244.3
Coronary artery calcium score, no. (%)			
0	4,751 (65.9)	4,685 (66.1)	66 (56.9)
1-10	697 (9.7)	689 (9.7)	8 (6.9)
11-100	1,064 (14.9)	1,049 (14.9)	15 (12.9)
101-400	501 (6.9)	487 (6.9)	14 (12.1)
>400	188 (2.6)	179 (2.5)	9 (7.8)
Any atherosclerotic plaque, no. (%)	2,558 (35.5)	2,501 (35.3)	55 (47.4)
Plaque characteristics, no. (%)			
Calcified plaque	2,412 (33.3)	2,362 (33.3)	50 (43.1)
Non-calcified plaque	363 (4.9)	351 (4.9)	12 (10.3)
Mixed plaque	249 (3.3)	241 (3.4)	8 (6.9)
Significant stenosis, no. (%)	444 (6.2)	432 (6.1)	12 (10.3)

Values are shown as mean ± standard deviation or number (%).

NSR = normal sinus rhythm; CRBBB = complete right bundle branch block.

Table 3. Association between CRBBB and coronary computed tomography angiographic findings

Variables	Univariable analysis		Multivariable analysis		Propensity score matching analysis	
	Odds ratio (95% CI)	P Value	Adjusted odds ratio (95% CI)	P Value	Odds ratio (95% CI)	P Value
Coronary artery calcification ^a						
CRBBB	1.75 (1.19-2.57)	0.004	0.88 (0.56-1.36)	0.555	1.00 (0.76-1.44)	0.999
Non-CRBBB (reference)	1		1		1	
Any atherosclerotic plaque						
CRBBB	1.65 (1.42-1.90)	0.007	0.87 (0.57-1.32)	0.509	0.91 (0.65-1.32)	0.610
Non-CRBBB (reference)	1		1		1	
Calcified plaque						
CRBBB	1.52 (1.05-2.20)	0.028	0.78 (0.51-1.19)	0.232	0.81 (0.58-1.23)	0.382
Non-CRBBB (reference)	1		1		1	
Non-calcified plaque						
CRBBB	2.22 (1.21-4.07)	0.010	1.48 (0.77-2.89)	0.235	1.60 (0.85-3.09)	0.100
Non-CRBBB (reference)	1		1		1	
Mixed plaque						
CRBBB	2.11 (1.02-4.37)	0.046	1.12 (0.52-2.39)	0.777	1.52 (0.68-3.32)	0.297
Non-CRBBB (reference)	1		1		1	
Significant stenosis						
CRBBB	1.78 (0.93-3.26)	0.082	0.92 (0.48-1.74)	0.792	1.10 (0.62-2.02)	0.755
Non-CRBBB (reference)	1		1		1	

CI = confidence interval; CRBBB = complete right bundle branch block.

^aCoronary artery calcification is defined as coronary artery calcium score >10.

Continuous variables in the multivariable model include age, sex, obesity, diabetes mellitus, hypertension, hyperlipidemia, current smoking, family history of coronary artery disease, and C-reactive protein (≥2 mg/L).