

# Advanced interatrial block is a predictor of atrial fibrillation in patients with severe heart failure

<sup>1</sup>F Sadiq Ali, <sup>1</sup>A Enriquez, <sup>2</sup>D Conde, <sup>1</sup>D Redfearn, <sup>1</sup>K Michael, <sup>1</sup>C Simpson, <sup>1</sup>H Abdollah, <sup>3</sup>A Bayés De Luna, <sup>1</sup>A Baranchuk.

<sup>1</sup> Kingston General Hospital/Queen's University, Kingston, Ontario, Canada

<sup>2</sup> Instituto Cardiovascular de Buenos Aires (ICBA), Buenos Aires, Argentina

<sup>3</sup> Institut Catala Ciències Cardiovasculars, Barcelona, Spain

## INTRODUCTION

Advanced Interatrial block (IAB) on the surface electrocardiogram (ECG) is defined as P-wave duration > 120 ms with biphasic (positive-negative) morphology in the inferior leads. Advanced IAB was found to be associated with atrial fibrillation (AF) in different clinical scenarios. The aim of this study was to determine the prevalence of IAB in a selected group of patients with severe heart failure (HF) requiring cardiac resynchronization therapy (CRT) and to evaluate whether advanced IAB could predict new onset AF in this population.

## METHODS

Retrospective electronic chart review of consecutive patients undergoing CRT implantation between January 2008 and December 2012. Patients with prior history of AF were excluded. Data was recorded for clinical, echocardiographic and ECG variables. Semiautomatic calipers and scanned ECGs at 300 DPI maximized x8 were used to diagnosed advanced IAB on ECG prior to implantation. The occurrence of AF was retrospectively assessed through analyses of intracardiac electrocardiograms available on routine device follow-up and clinical presentations recorded in the chart

## RESULTS

We included 97 patients. As noted in Table 1, 37 patients (38%) had advanced IAB at the baseline and AF occurred total of 29 (30%) patients in a follow-up of 32±18 months.

**Table 1: Baseline clinical characteristics**

Clinical variable	
Age, in years	67±9.6
Gender(% male)	72 (74.2)
Hypertension (%)	39(40.2)
Diabetes Mellitus(%)	31(32.0)
Etiology of Cardiomyopathy	
Ischemic	61(63)
Non ischemic	35(36)
Combined ischemic and non-ischemic	1(1.0)
Mean LA size	45.5±7.8
Mean LVEF	23.8±6.4
Mean P-wave duration, ms	138.5 ±18.5
Advanced Interatrial block (%)	37(38)

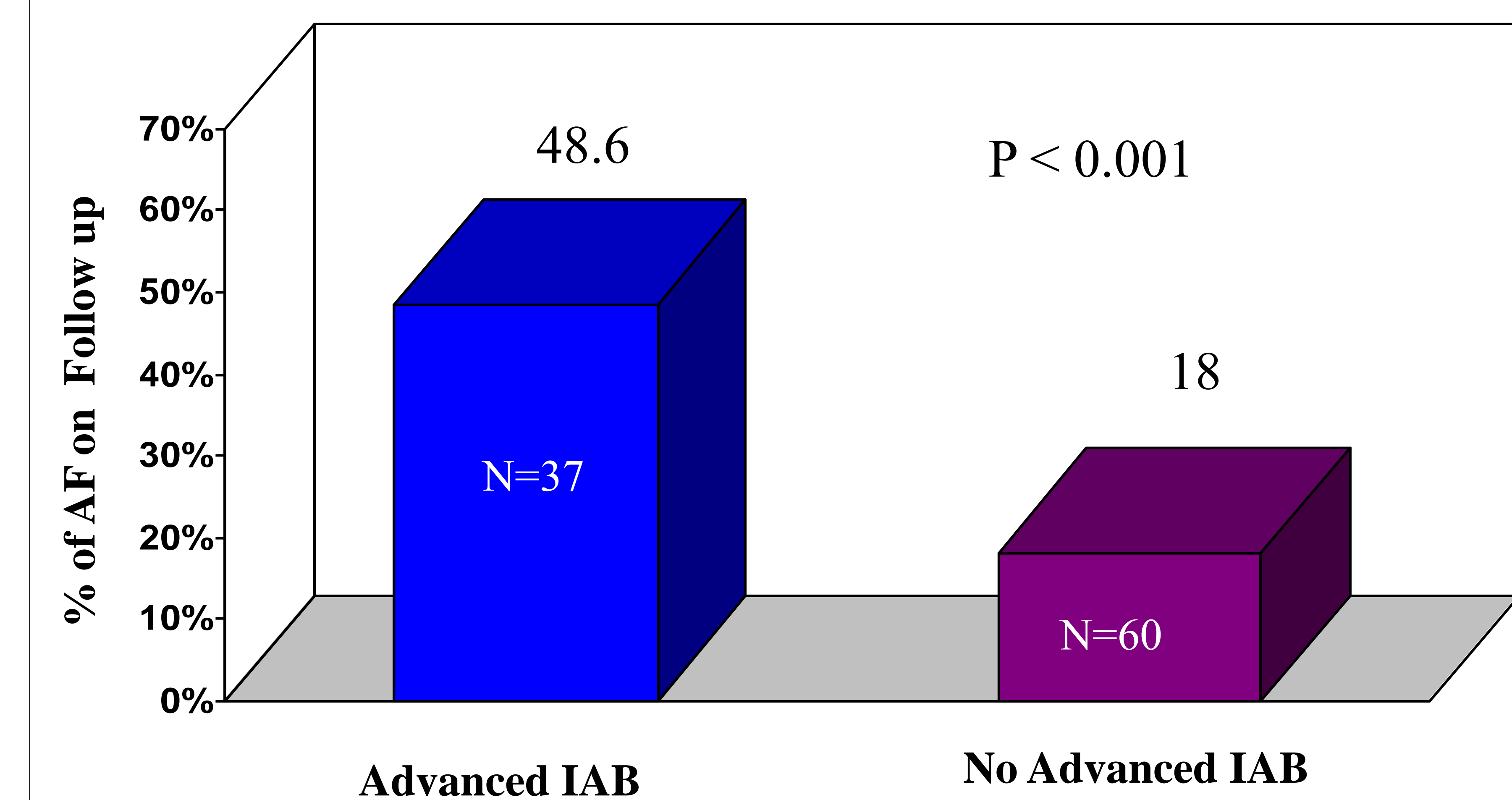
**Table 2: Clinical characteristics of patients with and without atrial fibrillation at follow-up**

Clinical variable	Atrial fibrillation (n=29)	No atrial fibrillation (n=68)	P value
Age, years	70±7.3	65.75±10.2	0.02
Gender			
Male	24(82.2)	48(70.6)	0.31
Female	5(17.2)	20(29.4)	
Hypertension	10(34.5)	29(42.6)	0.50
Diabetes Mellitus	8(27.6)	23(33.8)	0.63
Ischemic cardiomyopathy	22(75.9)	39(57.4)	0.11
Mean LA size	47.4±7.8	44.7±7.7	0.18
Mean LVEF	24.8±6.7	23.3±6.3	0.3
Mean P- wave duration, ms	145.6 ± 21.3	135.5 ± 16.3	0.03
Advanced Interatrial block (ms)	18(62)	19(28)	0.003

**Table 3: Predictors of atrial fibrillation on multivariate analyses**

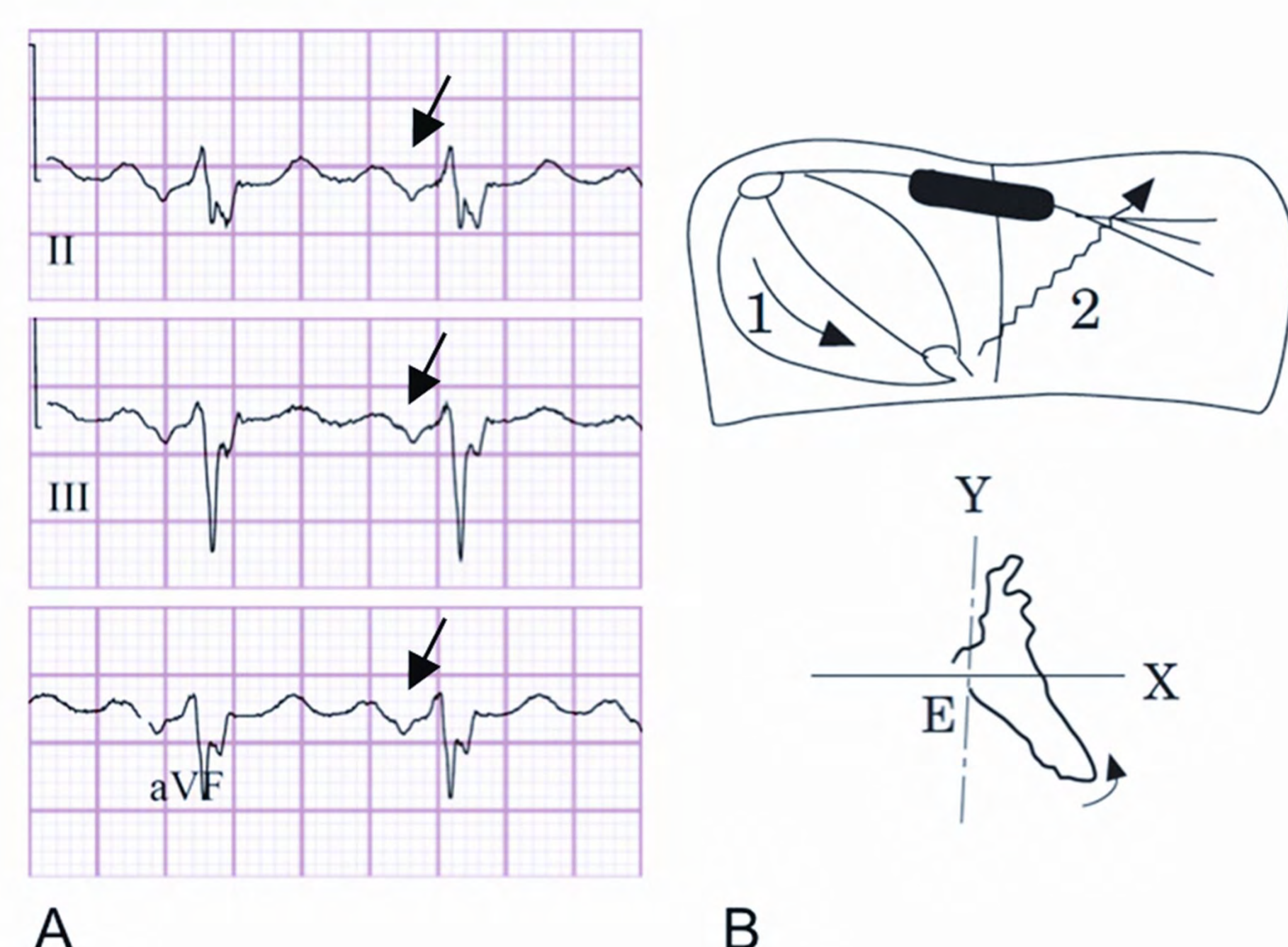
Clinical variable	Odds Ratio	95% Confidence Interval	P value
Age, in years	1.05	1.00-1.11	0.053
Advanced IAB	4.13	1.60-10.70	0.003

**Figure 1: New onset atrial fibrillation in patients with and without Advanced IAB**



## CONCLUSIONS

IAB was detected in more than one third of this population. The presence of advanced IAB is an independent predictor of occurrence of AF in patients with severe HF undergoing CRT implantation and no prior history of AF.



**Figure 2:: Panel A:** Typical ECG of aIAB with p-wave duration > 120 ms and biphasic morphology in inferior leads (see arrow).

**Panel B:** Diagram of atrial conduction showing block of the electrical impulse in the upper and middle part of the interatrial septum and retrograde LA activation via muscular connections in the vicinity of coronary sinus.