

Characterization of Responders after Cardiac Resynchronization Therapy Implantation

Thesis

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By

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List of Abbreviations

ACC	: American College of Cardiology
ACE	: Angiotensin converting enzyme
AF	: Atrial fibrillation
AHA	: American Heart Association
ARB	: Angiotensin receptor blocker
ARR	: Absolute risk reduction
AV	: Atrioventricular
b.i.d	: bis in die
BiV	: Biventricular
CHF	: Congestive heart failure
CI	: Confidence interval
CKD	: Chronic kidney disease
CLD	: Chronic liver disease
COPD	: Chronic obstructive pulmonary disease
CPI	: Cardiac Pacemakers Incorporation
CPX	: Cardiopulmonary exercise testing
CR/XL	: Controlled release / extended release
CRT	: Cardiac resynchronization therapy
CRT-D	: Cardiac resynchronization therapy with a
CRT-P	: Cardiac resynchronization therapy pacemaker Defibrillator
ECG	: Electrocardiogram
EF	: Ejection fraction
ESC	: European Society of Cardiology
ESICM	: European Society of Intensive Care Medicine
ESPVR	: End-systolic pressure–volume relationship
FDA	: Food and drug administration
HF	: Heart failure
HFA	: Heart Failure Association
HFLEF	: Heart failure with low ejection fraction
HFPEF	: Heart failure with preserved ejection fraction
HR	: Hazard ratio
HRS	: Heart Rhythm Society

List of Abbreviations (*Cont...*)

ICD	: Implantable cardioverter defibrillator inhibited pacing
IVCD	: Interventricular conduction delay
LA	: Left atrial
LBBB	: Left bundle branch block
LV	: Left ventricular
LVEDD	: Left ventricular end diastolic diameter
LVEDV	: Left ventricular end diastolic volume
LVEF	: Left ventricular ejection fraction
LVEF	: Left ventricular ejection fraction
LVESD	: Left ventricular end systolic diameter
LVESV	: Left ventricular end systolic volume
LVSD	: LV systolic dysfunction
MBP	: Mean blood pressure
MLHFQ	: Minnesota living with heart failure questionnaire
MR	: Mitral regurgitation
MRA	: Mineralocorticoid receptor antagonist
MRI	: Magnetic resonance imaging
ms	: millisecond
MSCT	: Multislice computed tomography
NASPE	: North American Society of Pacing and Electrophysiology
NNT	: Number needed to treat
NSR	: Normal sinus rhythm
NYHA	: New York Heart Association
OPT	: Optimum pharmacological therapy
OR	: Odds ratio
pVO₂	: Peak oxygen consumption
QOL	: Quality of life
RAAS	: Rennin–angiotensin– aldosterone system
RBBB	: Right bundle branch block
RRR	: Relative risk reduction
RV	: Right ventricular
RVOT	: Right ventricular outflow tract
RVSP	: Right ventricular systolic pressure

List of Abbreviations (*Cont...*)

SD	: Standard deviation
VDD	: Ventricular pacing, atrial sensing, both inhibited and triggered mode
VE/CO₂	: Ventilation/carbon dioxide ratio
VF	: Ventricular fibrillation
VT	: Ventricular tachycardia
VVI	: Ventricular sensing, ventricular pacing and ventricular
6MWT	: 6 minute walk test

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words to express my gratitude.*

Introduction

Cardiac resynchronization therapy (CRT) has changed the clinical management of patients with drug-refractory heart failure (HF).

Various randomized controlled trials have shown significant improvements in symptoms, left ventricular (LV) function, and long-term survival. However, approximately 30% to 40% of HF patients do not show clinical and/or echocardiographic response to CRT (*Dickstein et al., 2010*).

So far, better characterization of patients who will respond to CRT has been the main focus of ongoing research. However, identification of non-responders to CRT may be also of interest (*Bax et al., 2009*).

Current inclusion criteria may not be accurate enough to differentiate patients who will or will not respond to CRT. Other pathophysiologic factors such as HF etiology, LV dimensions and function, mitral regurgitation, LV dyssynchrony, position of LV pacing lead, and extent/location of myocardial scar have also shown to influence CRT response (*Castel et al., 2009*).

Comprehensive characterization of HF patients who do not respond to CRT may help to further identify the pathophysiologic factors that strongly influence response to CRT (*Vidal et al., 2010*).

Aim of the Study

This is a retrospective study in a single centre (Ain Shams University Hospitals) that aims at characterization of responders after CRT implantation.