
**Study of Right Ventricular Myocardial
Systolic Activation in patients with
Pulmonary Hypertension by Tissue
Doppler Imaging**

*Thesis
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By
Wael Gomaa Ibrahim
M.B, Bch

Supervised by
Prof. Dr. Maiy Hamdy El-Sayed
*Professor of Cardiology
Faculty of Medicine- Ain-Shams University*

Prof. Dr. Ghada Samir El-Shahed
*Professor of Cardiology
Faculty of Medicine- Ain-Shams University*

Dr. Alaa Mahmoud Roshdy
*Assistant Professor of Cardiology
Faculty of Medicine- Ain-Shams University*

Faculty of Medicine
Ain-Shams University

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List of Abbreviations

act. T	Activation time. .
ANP	Atrial Natriuretic Peptide.
AR	Aortic regurgitation.
AV block	Atrio-ventricular block..
BNP	Beta Natriuretic Peptide
BP	Blood pressure
CHD	Congenital heart disease.
cTDI	Color-coded tissue Doppler imaging
CTEPH	Chronic thromboembolic pulmonary hypertension.
CXR	Chest X-Ray.
2D	Two dimensional echocardiography.
ECG	Electrocardiography.
EDD	End diastolic dimension.
EDV	End diastolic volume.
EEPV	Endejction pressure/volume.
EF	Ejection fraction.
EIT	Electrical Impedance Tomography.
ES	Eisenmenger Syndrome.
ESC	European Society Of Cardiology.

ESD	End systolic dimension.
ESV	End systolic volume.
ET	Ejection time.
FAC	Fractional area change.
FS	Fraction shortening.
HIV	Human immunodeficiency virus.
IPAH	Idiopathic Pulmonary Hypertension.
IVC	Inferior vena cava.
IVCT	Isovolumic contraction time.
IVRT	Isovolumic relaxation time.
IVSd	Interventricular septum in diastole.
6MWT	6-min walk test.
LA	Left atrium.
LV	Left ventricle.
Max PV	Maximum pressure-volume ratio.
MPAP	Mean Pulmonary Artery Pressure.
MRI	Magnetic resonance imaging.
MVG	Myocardial velocity gradient.
NIH	National institutes of health.
NYHA	New York Heart Association

PA	Pulmonary Artery.
PAH	Pulmonary Arterial Hypertension.
PAPVD	Partial anomalous pulmonary venous drainage.
PCH	Pulmonary capillary hemangiomatosis.
PCWP	Pulmonary capillary wedge pressure.
PDA	Patent ductus arteriosus.
PEP	Pre ejection period
PGI^v	Prostacyclin.
PR	Pulmonary regurgitation.
PRV	Peak pulmonary regurgitant velocity.
pTDI	Pulsed wave tissue Doppler imaging.
PWd	Posterior wall in diastole.
PVOD	Pulmonary veno-occlusive disease.
PVR	Pulmonary Vascular Resistance.
RA	Right atrium.
RAP	Right atrial pressure.
RIMP	RV index of myocardial performance.
RV	Right ventricle.
RVAd	Right ventricular area in diastole.
RVAs	Right ventricular area in systole.

RVOT	Right ventricular outflow tract.
RVSP	Right ventricular systolic pressure.
SPAP	Systolic pulmonary artery pressure.
TGF- β	Transforming-growth-factor-beta.
TDI	Tissue Doppler imaging.
TR	Tricuspid valve Regurgitation.
TPR	Total pulmonary resistance.
TSI	Tissue synchronization imaging.
TT	Tissue tracking
WHO	World health organization.

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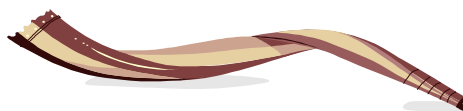
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Introduction

Congenital heart disease (CHD) is surely not uncommon with an incidence of 1/120 live births. The risk is estimated at 2 to 3% in children with an affected first-degree relative (higher if the relative is a parent)⁽¹⁾.

Approximately one third of all patients with CHD who have not undergone corrective procedures will die from pulmonary vascular disease. However, the frequency of pulmonary hypertension and the subsequent development of reversed shunting vary depending on the specific heart defect and operative interventions⁽²⁾.

The assessment of pulmonary vascular resistance (PVR) is an essential component of the evaluation of any patient with known or suspected pulmonary hypertension secondary to CHD. The current standard for measuring the pulmonary vascular resistance is cardiac catheterization (well established technique, its invasive nature poses significant risk to the seriously ill patients who are usually in need of these measurements)⁽³⁾.

A noninvasive method of evaluating PVR would (1) allow more frequent assessment of PVR, (2) facilitate the monitoring of individual patient responses, (3) provide a safer and easier method of estimation (4) provide a wide spread method of diagnoses that would help in early detection of patients liable to develop pulmonary hypertension⁽⁵⁾.

It is therefore no surprise that echocardiographers continue to search for accurate, noninvasive means of quantifying PVR. Conventional echocardiography only provides structural information