RATIO OF LEFT ATRIAL VOLUME TO LEFT VENTRICULAR VOLUME AS A PARAMETER TO ASSESS LEFT VENTRICULAR DIASTOLIC DYSFUNCTION IN HYPERTENSIVE PATIENTS

Thesis

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بسم الله الرحمن الرحيم
وَأَنْزَلَ اللهُ عَلَيْكَ
الْكِتَابَ وَالْحِكْمَةَ
وَعَلَّمَكَ مَا لَمْ
تَكُنْ تَعْلَمُ وَكَانَ
فَضْلُ اللهِ عَلَيْكَ
عَظِيمًا
صدق الله العظيم
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I dedicate this work to my Father, Mother and Brother for supporting me and pushing me forward all the time from the A, B, C to the M.Sc.

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LIST OF ABBREVIATIONS

Abbrev.	Full term
ABPM	Ambulatory blood pressure monitoring
ACEI	Angiotensin converting enzyme inhibitor
AF	Atrial fibrillation
Ao	Aorta
AP diameter	Anteroposterior diameter
ARBS	Angiotensin II receptor blockers
ASE	American society of echocardiography
B-blocker	Beta receptor blockers
BMI	Body mass index
BP	Blood pressure
BSA	Body surface area
CAD	Coronary artery disease
CD	Collecting ducts
CHF	Congestive heart failure
CKD	Chronic kidney disease
CVA	Cerebrovascular accident
CVD	Cardiovascular disease
DASH	Dietary Approaches to Stop Hypertension
DBP	Diastolic blood pressure
DCT	Distal convoluted tubules
DT	Deceleration time
ECG	Electrocardiography
ESC	European society of cardiology
HBPM	Home blood pressure monitoring
HDL	High density lipoprotein
HF	Heart failure
HFpEF	Heart failure with preserved ejection fraction
IHD	Ischemic heart disease
IVRT	Isovolumetric relaxation time

LIST OF ABBREVIATIONS (Cont...)

Abbrev.	Full term
IVS	Inter ventricular septum
JNC-7	Seventh Report of the Joint National committee
LA	Left atrium
LAV	Left atrial volume
LAVI	Left atrial volume index
LDL	Low density lipoprotein
LSD	Least standard deviation test
LV	Left ventricle
LVED	Left ventricular end diastolic diameter
LVES	Left ventricular end systolic diameter
LVH	Left ventricular hypertrophy
LVMI	Left ventricular mass index
LVOT	Left ventricular outflow tract
LVV	Left ventricular volume
MDRD	Modification of Diet in Renal Disease
MI	Myocardial infarction
MV	Mitral valve
NHS	National Center for Health Statistics (US) , United States
NICE	National Institute for Health and Clinical Excellence
NW	Normal wall
PWD	Pulsed wave Doppler
PWT	Posterior wall thickness
RVSP	Right ventricular systolic pressure
SBP	Systolic blood pressure
SNJ	Sinotubular junction
Sup inf diam	Superior inferior diameter
SVR	Systemic vascular resistance
TDI	Tissue Doppler imaging
TPR	Total peripheral resistance
TR	Tricuspid regurgitation
TV	Tricuspid valve

INTRODUCTION

Hypertension, commonly referred to as "high blood pressure," is a medical condition in which the blood pressure is chronically elevated. It is considered when initial clinic blood pressure 140/90 mmHg or higher and subsequent ambulatory blood pressure monitoring (ABPM) daytime average or home blood pressure monitoring (HBPM) average blood pressure 135/85 mmHg or higher.***(*Bryan W *et al, 2011).***

Many Previous studies have reported an association between blood pressure, ventricular hypertrophy, and increased atrial dimensions. Hypertension, ventricular hypertrophy and other cardiovascular diseases could potentially lead to diastolic dysfunction, elevation of filling pressures, and left atrial (LA) remodeling from chronic pressure overload ***(Pritchett et al., 2005).***

With increased stiffness or noncompliance of the LV, LA pressure rises to maintain adequate LV filling, and the increased atrial wall tension leads to chamber dilatation and stretch of the atrial myocardium. So in subjects without primary atrial pathology or congenital heart or mitral valve disease, increased LA volume usually reflects elevated ventricular filling pressures and LA volume increases with severity of diastolic dysfunction ***(Abhayaratna et al., 2006).***

Within hypertensive populations, increased LA volume in echocardiography is a common finding and LA diameter has been related to higher age and systolic blood pressure, female gender, obesity, LV hypertrophy especially if in the form of eccentric geometry ***(Gerdts et al., 2002).***

Recently left atrial enlargement has been suggested as a more robust marker of the severity and duration of left ventricular diastolic dysfunction. In subjects without atrial pathology or congenital heart or mitral valve disease, increased left atrial volume (LAV) usually reflects elevated ventricular filling pressure; there are many indexes of echocardiography used as an index to evaluate left atrial size. the LAV/(LVV) may be more reasonable to reflect left atrial enlargement in the patients with hypertension, because hypertensive patients have a characteristic of concentric remodeling of the left ventricle which is often accompanied with diastolic dysfunction ***(Li et al., 2009)***.

Indeed the Doppler-derived indexes mainly reflect the left atrial driving pressure. Nowadays LAV has been suggested as a marker of the severity and duration of diastolic dysfunction. Compared with left atrial size, Doppler indexes reflect filling pressures at one point in time, whereas increased left atrial size may better reflect the cumulative effect of filling pressures over time ***(Li et al., 2009)***.