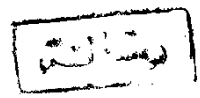
STUDY OF ELECTROCARDIOGRAPHIC CRITERIA OF BIVENTRICULAR HYPERTROPHY IN THE LIGHT OF ECHOCARDIOGRAPHIC FINDINGS



THESIS

Submitted in Partial Fulfilment of M.D.

Degree in CARDIOLOGY

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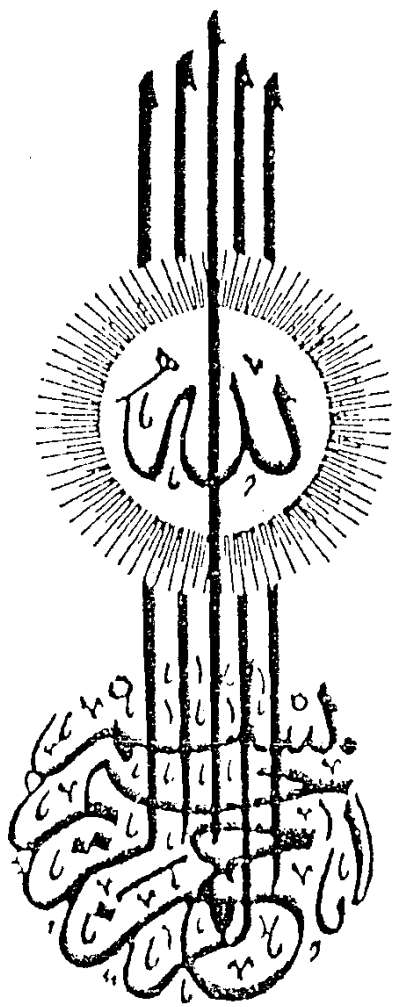

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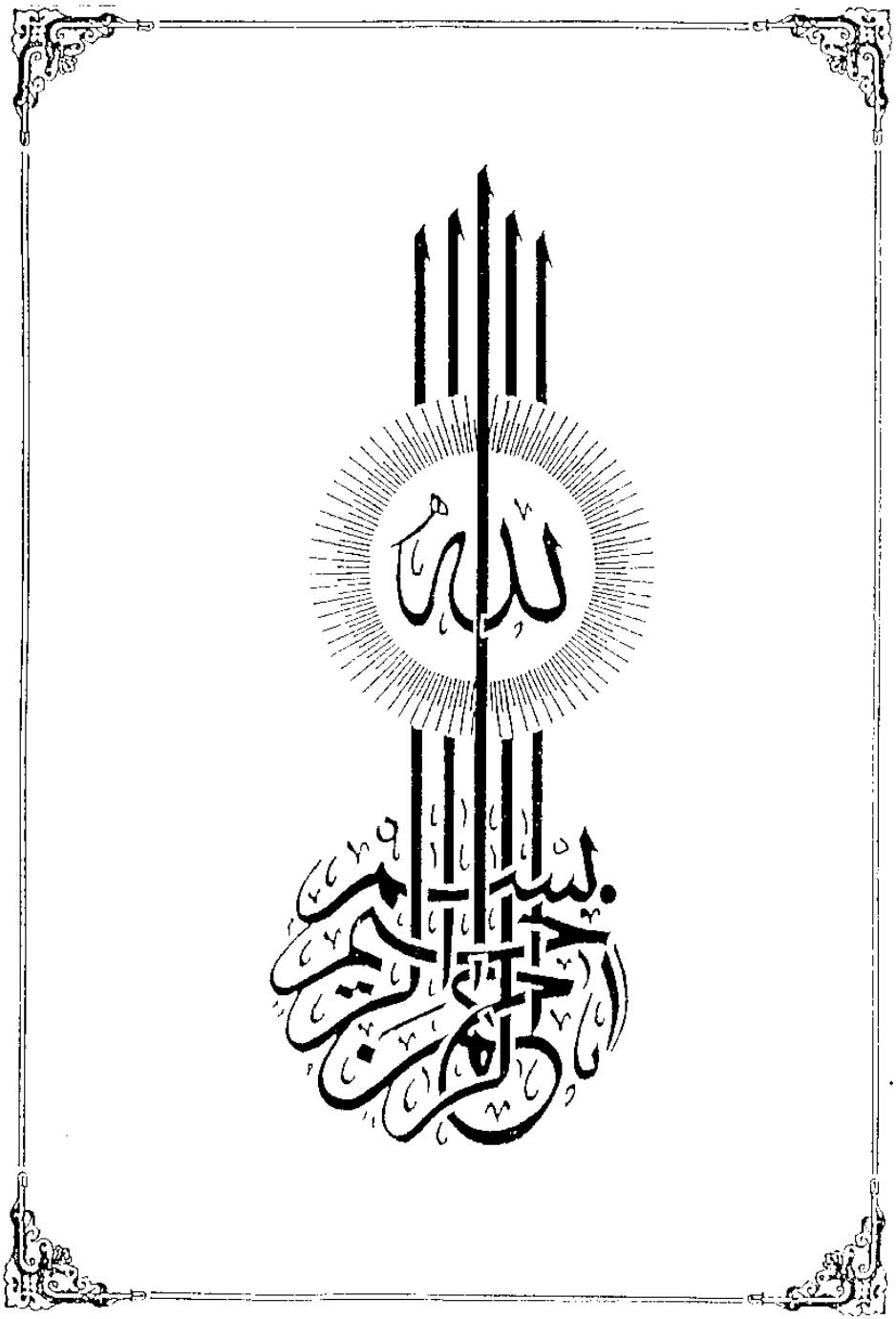

To the most one in love

and in sympathy with me

to MY MOTHER.

ACKNOWLEDGEMENT

I would like to express my extreme gratitude and appreciation to **Professor HAMDI EL DEMERDASH** for his continous guidance, patience and kind assistance. I will never forget him as an excellent supervisor and kind father.

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LIST OF ABBREVIATIONS

R.V.H.	:	Right Ventricular Hypertrophy.
L.V.H.	:	Left Ventricular Hypertrophy.
C.V.H.	:	Combined Ventricular Hypertrophy.
R.A.D.	:	Right Axis Deviation.
L.A.D.	:	Left Axis Deviation.
2 D	:	2 Dimensions.
L.A.	:	Long Axis.
S.A.	:	Short Axis.
$LVID_d$	:	Left Ventricular Internal Dimension in diastole.
$i.v.s.th_d$	:	Inter Ventricular Septal Thickness in diastole.
$PWth_d$	:	Posterior Wall thickness in diastole.
L.V.M.	:	Left Ventricular Mass.
$RVWth_s$	:	Right Ventricular Wall thickness in Systole.
$RVWth_d$	:	Right Ventricular Wall thickness in diastole.
$RVID_d$	:	Right Ventricular Internal dimension in diastole.
ASD	:	Atrial Septal Defect.
P.S.	:	Pulmonary Stenosis.
P.H.	:	Pulmonary Hypertension.
Rh.H.D.	:	Rheumatic Heart Disease.
Cong.H.D.	:	Congenital Heart Disease.
L.S.B.	:	Left Sternal Border.
P_2	:	Pulmonary component of the second sound.
A_2	:	Aortic component of the second sound.
S_3	:	Third heart sound.

S_4	:	Fourth heart sound.
1ry P.H.	:	Primary Pulmonary Hypertension.
M.S.	:	Mitral Stenosis.
M.R.	:	Mitral Regurge.
T.R.	:	Tricusped Regurge.
A.R.	:	Aortic Regurge.
A.F.	:	Atrial Fibrillation.
V.S.D.	:	Ventricular Septal Defect.
P.D.A.	:	Patent Ductus Arteriosus.
A.V.R	:	Aortic Valve Replacement.
M.V.R.	:	Mitral Valve Replacement.
O.M.V.	:	Opened Mitral Valvotomy.
R.V.P.	:	Right Ventricular Hypertension.
VAT	:	Ventricular Activation Time.
P	:	Pattern.
P-P	:	P- pulmonale.
P-M	:	P- Mitral.
P.T.F.	:	P- Terminal Force.
R.V.S.	:	Right Ventricular Strain.
L.V.S.	:	Left Ventricular Strain.
A.S.E.	:	American Society of Echo.
P.	:	Penn Convention.
R.E.	:	Romhilt - Estes Point Score for L.V.H.
S.L.	:	Sokolow and Lyon Criteria for L.V.H., R.V.H.
M,K,S	:	Myers, Klein and Stofer criteria for R.V.H.
G.A.	:	Goodwin and Abdin grades for RVH.
Scott	:	ScottCriteria for L.V.H.
H.T.	:	Hypertension.
✗	:	Coarctation of Aorta.

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INTRODUCTION

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AIM OF WORK

INTRODUCTION AND AIM OF THE WORK

Assessment of ventricular hypertrophy is essential for the diagnosis and follow-up of cardiac patients. Electrocardiography is a valuable and easy tool in the diagnosis of ventricular hypertrophy, but it is still far from perfect in the diagnosis of combined ventricular hypertrophy (Goldman, 1983).

Different necropsy data have shown that Echocardiography is an excellent tool in detection of ventricular hypertrophy, while the E.C.G. is less sensitive and less specific (MC Farland et al., (1978) and Reichek, Devereux, (1981)). The present study will take echo as gold standard to evaluate electrocardiographic criteria of right, left and combined ventricular hypertrophy.

Aim of the work :

The aim of this study is to revise the sensitivity specificity, predictive value (+ve, -ve) and accuracy of E.C.G. criteria of right, left and combined ventricular hypertrophy collectively and individually in the light of echocardiographic findings.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

The Embryology of Ventricles

Davies and Davies (1964) explained that the development of the heart starts by growth of groups of angioblasts which give rise to two paramedian endothelial tubes, which rapidly fuse to form tubular heart. With more growth of this tissue, bulbus cordis and ventricles are developed with transverse groove appears on the heart tube and indicates the junction between them. The bulbus is continous with the first aortic arch through truncus arteriosus.

During the fifth week, the right and left ventricles are indicated as slight projections on the surface of the common ventricle. The appearance of a crescentic ridge in the inside of the heart indicates the separation between the two ventricles, and as the heart enlarges, this ridge deepens to form the ventricular septum. The dorsal and ventral horns of the septum meet and fuse with the corresponding endocardial cushions of the atrial canal near their right extremities.

The Anatomy of Ventricles

Left ventricle (Davies and Davies, 1964) :

The left ventricle is longer and more conical in shape than the right, and forms the apex of the heart. Its wall about three times as thick as those of the right ventricle. It takes part in the formation of the sterno-costal and left surfaces of the heart and is separated from the mediastinal surface of the left lung by the pericardium, the left phrenic nerve and pericardiophrenic vessels, and the left pleura. Inferiorly, it forms a large part of the diaphragmatic surface of the heart. Anteriorly and to the right, it is separated from the right ventricle by the ventricular septum. The interior of the left ventricle presents several important features. The mitral orifice which is surrounded by a dense, fibrous ring and is guarded by the left artioventricular or mitral valve. The aortic orifice which is separated from mitral orifice by the anterior cusp of the mitral valve. The aortic orifice has a diameter over 2.5 cm, and is guarded by the aortic valve. The portion of the ventricle - immediately below the aortic orifice - is termed the aortic vestibule and possesses fibrous instead of muscular walls. The cusps of the mitral valve are furnished with chordae tendineae which are attached to papillary muscles, which are two in number, anterior and posterior.

Right ventricle :

Romanes (1971) stated that the right ventricle extends from right atrium nearly to the apex of the heart. Its anterosuperior surface is convex, and forms a large part of the sternocostal surface of the heart. Its inferior surface is flattened and related to the central tendon and adjoining part of the diaphragm. The postero-superior angle is the funnel-shaped infundibulum from which the pulmonary trunk arises.

The anterior of the right ventricle is separated into two parts, inflowing and outflowing by the supra-ventricular crest, situated between the atrioventricular and pulmonary orifices.

The internal surface of the right ventricle is ridged by a number of irregular muscle bundles, known as the trabeculae carneae, while the infundibulum is of smooth wall. In addition to the trabeculae carneae, a number of conical muscle masses (papillary muscles) project from the wall of the ventricle, these are attached to tendinous strands (Chordae tendineae) which pass to the margins and ventricular surfaces of the cusps of the right ventricle. There are usually three papillary muscles, posterior, anterior, and septal papillary muscles. At the summit of the infundibulum, the orifice of the pulmonary trunk is situated. It is circular in form

and has a diameter of about three centimeters and surrounded by a thin fibrous ring which gives attachment to the cusps of the pulmonary valve. The pulmonary valve consists of three semilunar cusps, separated by three commissurs. The cusps (valvules) are named anterior, right and left, opposite each valvule, the wall of the pulmonary trunk is slightly dilates and forms pulmonary sinuses of valsalva.