ECHOCARDIOGRAPHIC FEATURES OF HYPERTENSIVE HEART DISEASE.

THESIS

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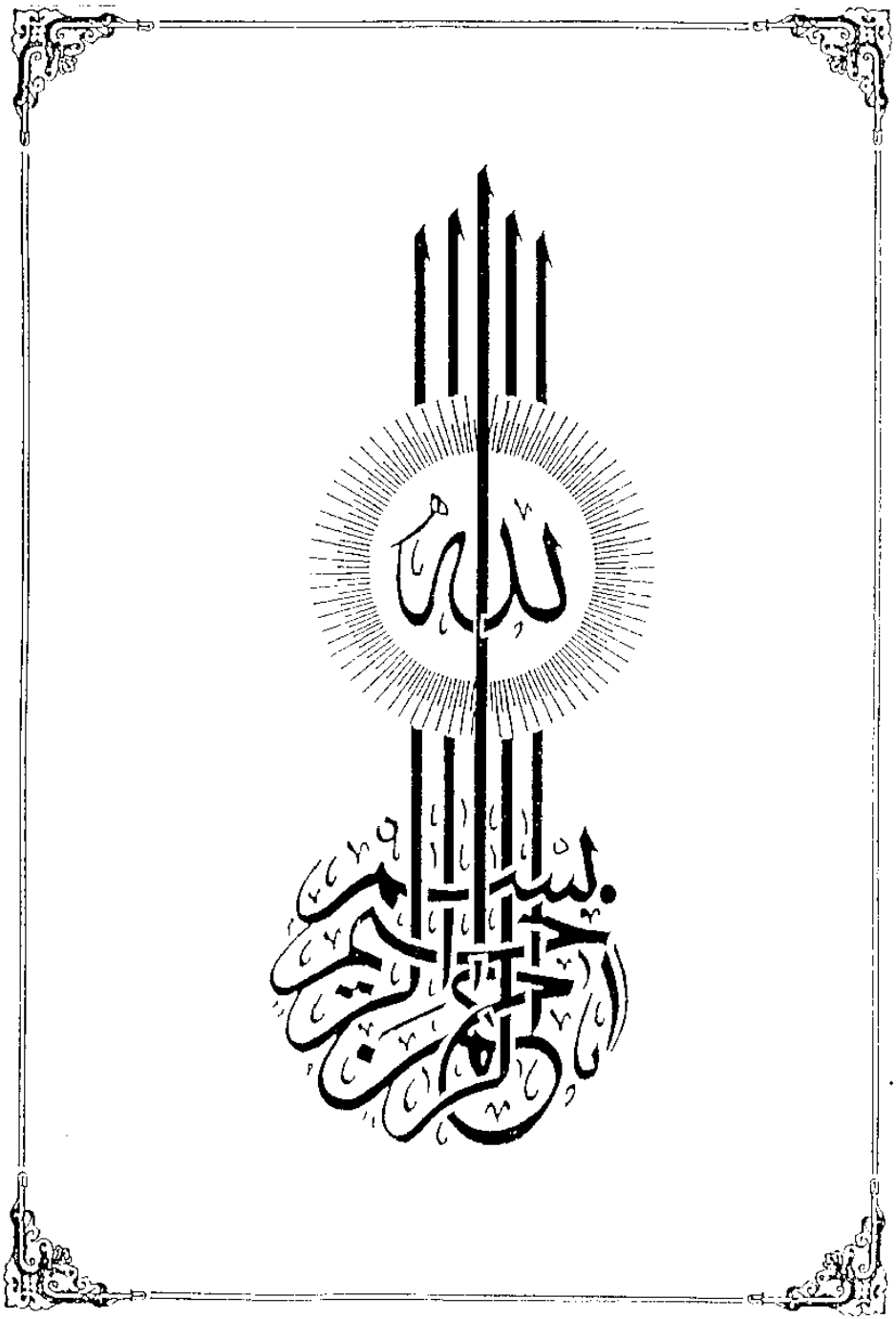

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INTRODUCTION

Hypertension is mankind's most common disease, affecting 15 to 20% of all adults[1].

Hypertension is a syndrome in which a raised blood pressure reading is only one facet. This syndrome affects primarily 4 organs, the heart, the kidney, the Brain and the peripheral blood vessels[2].

Accepting this view the heart is always affected in hypertension even before left ventiruclar hypertrophy is manifested by E.C.G. and chest X-ray.

There is no general agreement about the definition of hypertension but according to the W.H.O.[3], blood pressure is classified into:

Normotension:

(a) Age between 17 and 40 years blood pressure less than 140/90.

(b) Age 41 to 60 years blood pressure less than 150/90.

(c) Age over 60 years blood pressure less than 160/90.

Hypertension:

(a) Blood pressure above 160/100 at age 17 to 60 years.

(b) Blood pressure above 175/100 over age 60 years.

Borderine hypertension:

This is the blood pressure reading between the hypertensive and normotensive range[3].

It was thought before that systolic hypertension is not of importance, yet, recently according to insurance companies statestics, systolic hypertension affects the longivety of the patients[4].

Hypertension is a leading cause of both mortality and morbidity. Many of these result from damage to the heart inflicted by hypertension. Often clinicaly expressed as rapid and severe coronary artery disease[1]

In Egypt the real size of the problem is not definitely known, still with the wide spread infestation by urinary Bilharziasis and its known sequale, hypertension is expected to rank as one of the major cardiovascular problems.

The importance of early diagnosis of hypertensive heart disease lies in the fact that the condition is treatable, and if neglected it leads to major complications.

Despite advances in diagnosis and treatment of hypertension, hypertensive heart disease remains the most common cause of congestive heart failure.[5]

Because left ventricular hypertrophy usually preceedes this slowly developing cardiac failure, its early and acurate diagnosis is important. Till recently the litrature w was not rich in the echocardiographic manifestations of hypertensive heart disease.

This is most probably due to the common belief that left ventricular affection in hypertensive patients could be evaluated easily by the surface E.C.G. and chest Radiogram.

Since the early seventies a new diagnostic technique was found superior to the above mentioned procedures, that is echocardiography.

Echocardiography has introduced a new dimensions in the study of hypertensive heart disease[6,7,8,9].

Techniques have been well standerdised and values for normal subject in different series are in agreement[6,7,8].

Before the era of echocardiography, it was difficult to detect cardiac complications in hypertensive patients unless invasive studies were resorted to.

Echocardiography being noninvasive technique, offers a particularly attractive means for assessing hypertensive heart disease. It provides an accurate method for measuring ventricular wall thickness and for assessing left ventricular function[6].

Aim of the work:

Now with the new appreciation of the value of echocardiography in hypertension, this study was designed to describe the echocardiographic features in hypertensive heart disease, also to study the left ventricular functions in the same conditions.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

THE LEFT VENTRICULAR FUNCTION:

The first echocardiographic study of the hypertensive heart disease was done in 1975 by Toshima[10].

He studied the echocardiographc identification of anatomical and functional cardiac abnormalities of 40 patients aged from 18-71 years with asymptomatic hypertensive heart disease, in which their blood pressure was higher than 160/95 mm hg, before these abnormalities are dtected by E.C.G. and chest radiograms.

He classified the patients into 4 groups:

Type I:(Normal left ventricular echocardiogram) 10 patients.

Left ventricular echocardiogram without any abnormal finding. Patients showed little clinical symptoms and signs of hypertensive involvement.

Type II:(Symmetric hypertrophy of left ventricle)

Patients had high systolic pressure and marked hypertensive retinal and renal changes.

11 patients showed symmetric hypertrophy of left ventricle defined by the summed thickness of the interventricular septum and posterior left ventricular wall (IVTS+PWT) $\geq$ 2.6cm.

A ratio of the thickness of the septum to posterior left ventricular wall (IVTS/PWT) $\leq$ 1.3 and the left ventricular end-diastolic diameter (LVDd) $\leq$ 5.5.

Type III: (Asymmetric septal hypertroph)

The E.C.G. of there patients showed high voltage and marked ST-T changes, while retinal and renal changes were mild. Left ventriculogram obtained from 6 cases also revealed hypertrophy of the interventricular septum, and one of them revealed left ventricular outflow tract obstruction.

These cardiac features in type III, which are quite similar to those in hypertrophic cardiomyopathy, seemed to be a secondary change induced by systemic hypertension on the basis of some predisposition, (vide infra).

12 patients demonstrated asymmetric septal hypertrophy characterized by (IVTS) $\geq$ 1.5 and (IVTS/PWT) $\geq$ 1.3 , (IVDd) $\leq$ 5.5 cm.

Type IV: (Dilatation of the left ventricle).

Most patients had congestive heart failure.

7 patients had dilated left ventricular cavity (IVDd) $\geq$ 5.5 cm. wall thickness of the left ventricle was variable in this type.

They noticed that the ejection fraction as calculated by the left ventricular echocardiogram was normal in type I, type II, and type III with a mean value of 0.70 ± 0.15 in type I, 0.72 ± 0.11 in type II and 0.77 ± 0.09 in type III, respectively. On the other hand, the mean ejection fraction in type IV was 0.28 ± 0.22 which is significantly lower when compared with other types ($P > 0.005$).

In 1977 Dunn et al,[6] studied the ejection fraction in hypertensive heart disease and found that the left ventricular function was impaired only when the left ventricular hypertrophy was associated with cardiac failure. His study included 31 hypertensive patients with a diastolic blood pressure of more than 90 mm hg.

He classified the hypertensive patients into three groups on the basis of the electrocardiogram and chest radiograms.

Group I: Patients with normal E.C.G. and chest X-ray.

Group II: Patients with left atrial abnormality but normal X-ray.

Group III: Patients with a combined X-ray and E.C.G. evidence of left ventricular hypertrophy.

In this study classification of hypertensive heart