SYSTEMIC HYPERTENSION AND ARRHYTHMIAS

THESIS

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of Master Degree of

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by

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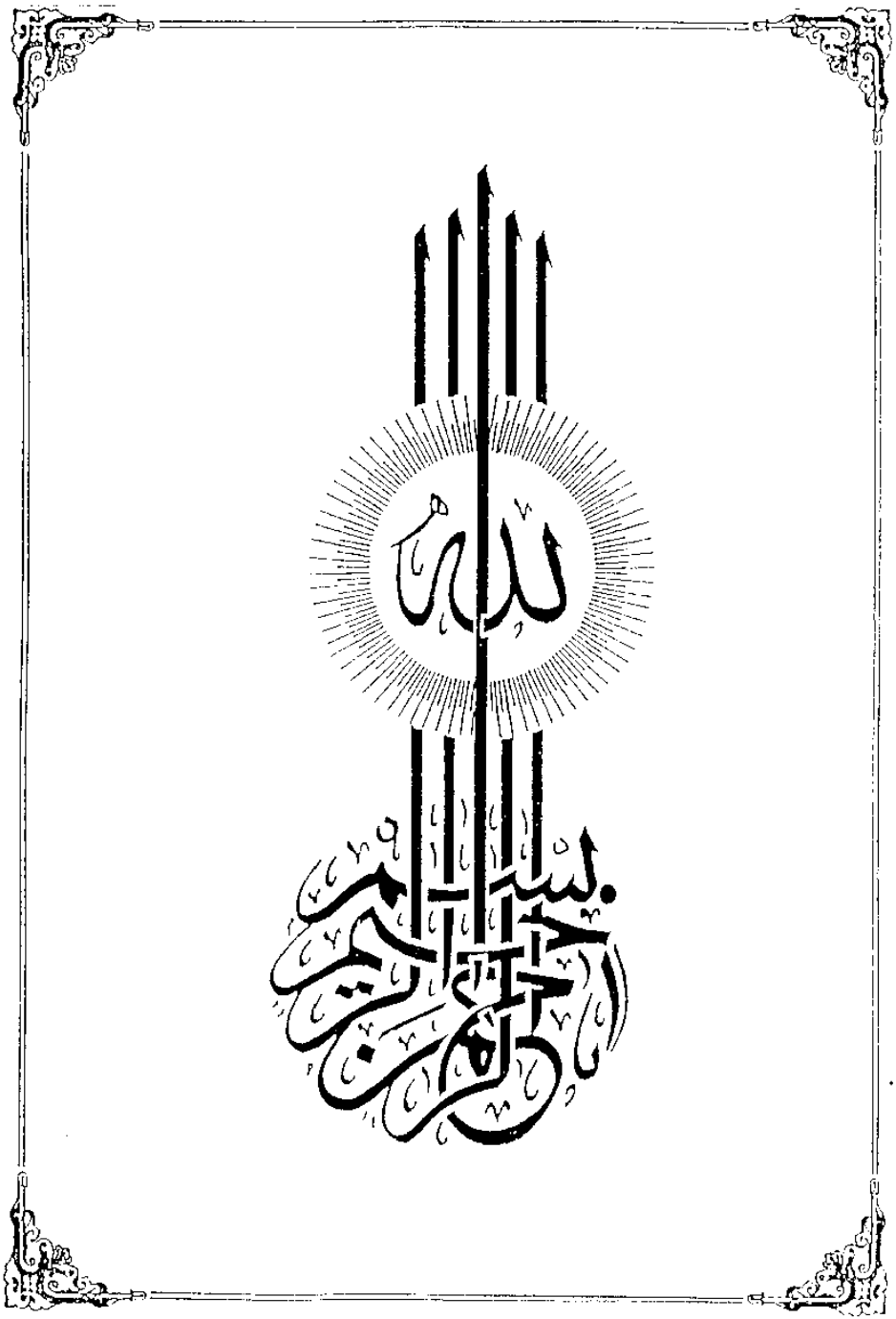
TO MY SUN

ABDEL RAHMAN



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CONTENTS

INTRODUCTION

What is hypertension ?

It is no longer difficult to say who is hypertensive & who is not . While the WHO defined hypertension as the blood pressure above 160/95 , the American Heart Association defined it as blood pressure above 140/90.
The WHO defined blood pressure between 140/90 & 160/95 as border line hypertension.

Life insurance acturial data indicate that mortality is related to blood pressure above the following levels :
Men below the age of 45 years 140/90 mmHg.
Men above the age of 45 years 140/95 mmHg.
Women of any age 150/95 mmHg. (1)

Elevated systolic blood pressure carries a high risk for cerebrovascular accidents. The Framingham data showed the increased incidence of cerebrovascular accidents in male & female patients with systolic blood pressure - 140 to 160 mmHg & diastolic blood pressure - 95 mmHg. (2),(3)

Elevated diastolic blood pressure is associated also with major coronary events . A study was done by the Pooling Project Research group on 700 white American men ages 40 to 59 years, a 52% increase in relative risk was noted for those in the middle group , whose diastolic blood pressure was between 80 & 87 mmHg, compared to patients with diastolic pressures below 80 mmHg. (4)

Classification of hypertension

After we diagnose that the patient is hypertensive , we face a second question :

Is this hypertension ; mild ,moderate ,or severe ?

This question is easy to answer as hypertension is classified according to the level of diastolic blood pressure into :

Mild with diastolic blood pressure 90 119 mmHg.

Moderate with diastolic blood pressure 105 119 mmHg.

Severe with diastolic blood pressure more than 120 mmHg.

Low mild hypertension is that with diastolic blood pressure 90 94 mmHg.

Labile hypertension is a poor word as the blood pressure of each hypertensive patient is fluctuating all the day ,border line hypertension should replace this word for such patients with blood pressure between 140/90 & 160/95. (5)

Treatment of hypertension.

We have diagnosed hypertension & put the patient in a certain group category as regards his blood pressure level. What remains ,the most important point in the patient point of view , is treatment.

Treatment ! is it drug , non drug or surgical!
Some times drug treatment is more easy to the patient than non drug treatment, as the latter includes :
weight reduction , diet regimen , physical training , stoppage of smoking , coffee & alcohol.

Drug treatment exposes the patient to cost & side effects.

Surgical treatment is indicated in some forms of hypertension as cushing syndrome is treated by adrenalectomy , pheocromocytoma is treated by resection of the suprarenal gland, hypertension with bilateral non functioning kidnies is treated by bilateral nephrectomy.

Now we will have a broad idea about the 2 lines of treatment the non drug & the drug treatment of hypertension.

Non drug treatment of hypertension.

Drug intake as a treatment of hypertension is not free of hazards as it exposes the patient to adverse reactions & side effects beside their cost

Some clinicians resort to non drug treatment as a simple & safe measure for treatment of mild hypertension

Non drug treatment of hypertension includes :

1.Sodium restriction.

2.Weight reduction.

3.Physical training & exercise.

4.Potassium supplement.

5.Dietary measures.

6.Calcium supplement.

7.Stoppage of alcohol intake.

8.Stoppage of coffee.

9.Stoppage of smoking.

Non drug treatment of hypertension in not only a way to treat hypertension but also a subsidary way in treatment of moderate & severe hypertension together with drug therapy.

Sometimes ie is difficult to the patient to reduce his weight or to restrict to a certain diet or to change his life style. Drugs are easier to take , so for such patients drug treatment is the only solution.

1.Sodium restriction

Many studies were done to show the effects of sodium restri ction on lowering the blood pressure in mild hypertension. Parijs in 1973 did an early controlled study of moderate salt restriction. He found a significant drop of blood pressure among 17 hypertensive patients who were maintained on moderate salt restriction diet. The decrease was greater when a diuretic was added. His data suggested that moderate salt restriction from 15 to 5 grams of salt per day should drop the blood pressure approx imately 10/5 mmHg. (6)

Morgan in 1978 reported results of treating mildly hyperten sive men with a 20% sodium restricted diet for 2 years. His results showed drop of blood pressure by an average of 4/4 mmHg. (7)

MacGregor in a double blind randomised crossover study in 1982 , showed that mild hypertensives dropped their blood pressure by 10/5 mmHg on moderately sodium restricted diet alone. (8)

Watt in 1983 using the same study design as MacGregor found no significant reduction in blood pressure between his regular diet & restricted sodium intake group.
But his results should be taken cautiously as his patients were already normotensive on drug therapy before starting the salt restriction . (9)

Parfery in 1981 made a very interesting study as he treated patients with mild to moderate hypertension (diastolic blood pressure 90 109 & diastolic blood pressure 110 130) with sodium restriction only.
However his study included patients with high sodium intake, when a very low sodium intake was carried out. His results showed drop of blood pressure significantly although the low sodium diet lasted 5 days only . (10)

The results of these studies showed that many hypertensive patients can be treated successfully with sodium restricted diet alone. This is indicated in mild hypertension.
Sodium restricted diet helps restriction of the doses of drugs used in treatment of moderate & severe hypertension. (10)

In using sodium restriction as a sole treatment of mild hypertension , the patient should be followed up for 3 months. If he does not respond to this regimen a diuretic should be added. (10)

2.Weight reduction

Weight reduction can help control of blood pressure in hypertensive patients, however there is no cause effect relation ship between obesity & hypertension. A number of studies were done to show the effect of weight reduction on lowering the blood pressure.

Ramsy et al in 1978 studied hypertensive obese patients & they concluded that each Kgm weight reduction is accompanied by 2.5/1.5 mmHg reduction of blood pressure. (11)

Reisen also in 1983 , studied obese hypertensive patients on low calorie , unrestricted salt diet for 24 weeks.
His patients lost an average of 10 Kgm & had an average fall of blood pressure of 10/9 mmHg. He theorised that fall in blood pressure was due to decreased total & central blood volume resulting in a lower venous return & cardiac output, possibly mediated by decreased catecholamine level. (12)

In 1983 Gillum studied the independent effect of both sodium restricted & calorie restricted diet in overweight , "borderline" hypertensives. He defined borderline hypertension as systolic blood pressure= 140 159 mmHg & diastolic blood pressure= 85 94 mmHg. Both his groups were between 10 50% overweight. His first group dropped their blood pressure 5.4/2.4 mmHg afterlosing a modest 5.2 Kgm. No significant change in blood pressure occurred when the group was placed on a moderate sodium (70 meq/day) diet afterwards. His second group was given the moderately sodium restricted diet first & their blood pressure fell by 5.8/4.9 mmHg When they then lost 4 Kgm, their blood pressure fell an

additional 3.4/4.8 mmHg with a total drop of 9.3/4.7 mmHg. He concluded that weight reduction & salt restriction are the first steps in the management of obese patients having or at a high risk for , essential hypertension. (13)

From these studies , we concluded that obese hypertensives can reduce their blood pressure by 2.5/1.5 mmHg for each Kgm reduction of their body weight.

3. Physical training & excercise.

Excercise elevates the systolic blood pressure & lowers the diastolic blood pressure , but physical training lowers both the systolic & the diastolic blood pressure. (14),(15)

A number of studies were done to evaluate the effect of physical training on the prevelance of coronary artery disease & its risk factors. Hypertension as one of the risk factors was studied also.

Bayer in 1970 showed a drop in blood pressure of 13,12 mmHg in middle age hypertensive patients over 6 months with training only 2 days a week with minimal weight loss. (16)

So physical training is a useful way to lower the blood pressure of hypertensive patient together with weight reduction & salt restriction. The problem in fact is patient compliance & maintainance of physical training.

4.Potassium supplement.

Potassium supplement to diet can lower the blood pressure of hypertensive patients. Skrabol theorised 4 mechanisms of action :
1.K has a saluretic effect on the kidney leading to decreased extracellular fluid space.
2.K decreases the baroreceptor response.
3.K prevents the increase in catecholamines seen with sodium restriction.
4.K helps improve the patient compliance on a low sodium diet , by replacing salty foods with fruits & vegetables &/or the use of salt substitutes. (17)

In 1983 Khaw ran a double blind , randomised , crossover study of K supplementation(46 meq/day) versus placebo on normotensive adults & obtained a fall of 1.1/2.4 mmHg in blood pressure. (18)

5.Dietary fat.

Recently the possible role of dietary fat in the management of hypertension has been studied. In 1983 Puska reported the effect of a diet low in fat but with a high ratio of polyunsaturated fat to saturated fat , on blood pressure. Total caloric & salt intake were kept constant.

After 6 weeks of dietary management her patients experienced an average fall in blood pressure of 9/8 mmHg. The fall was greater among her mild hypertensives (blood pressure dropped by 12/11 mmHg) ,than among the normotensives (blood pressure dropped by 6/5 mmHg).