DGAFMS MEDICAL MEMORANDUM No 151
ESSENTIAL HYPERTENSION

Introduction

1. Hypertension is a common cause of morbidity & occasional mortality among Armed Forces personnel. Untreated or inadequately treated hypertension over a period of time leads to atherosclerotic (coronary artery disease, Peripheral vascular disease & Ischaemic stroke) & hypertensive (nephrosclerosis, CCF, aortic dissection) complications. Unfortunately the disease is essentially asymptomatic in the initial decade or so & patients are unwilling to take medicines or alter life style. Patient education thus plays an important role.

2. In recent years there have been changes in our concepts regarding assessment & treatment of hypertension. These are reflected in the guidelines issued by the Joint National Committee on Hypertension (1997) & British Hypertension Society (1999). This memorandum has been drawn to incorporate these guidelines & issue directions for disposal of personnel suffering from hypertension.

Definition & Classification

3. 'Hypertension' unless otherwise qualified will denote raised systemic arterial blood pressure. It is defined as Systolic B P 140 mmHg or greater, and/or, diastolic BP 90 mmHg or greater. When there is no definable underlying cause it is called Essential,Primary or Idiopathic hypertension.

4. The following classification (table 1) of hypertension for adults will be used .

Table 1 Classification of Blood Pressure (mm of Hg)

Category	Systolic		Diastolic
Optimal	< 120		< 80
Normal	< 130	And	< 85
High Normal	130-139	Or	85-89
Hypertension			
Stage I	140-159	Or	90-99
Stage II	160-179	Or	100-109
Stage III	$\geq$ 180	Or	$\geq$ 110

When systolic and diastolic blood pressures fall into different categories, the higher category should be selected to classify the individual's blood pressure status.

Detection & confirmation

5. Hypertension should not be diagnosed on the basis of a single BP measurement. Initial elevated readings should be confirmed on atleast 2 subsequent occasions. Each measurement should begin after atleast 5 minutes of rest with the patient seated in a chair & arms supported at heart level. Person should refrain from smoking or ingesting caffeine during the 30 minutes preceding the measurement. Appropriate cuff size must be used so that the bladder within the cuff should encircle atleast 80 percent of the arm & measurements should preferably be taken with a mercury sphygmomanometer. Both the systolic BP (Phase I Korotkoff) & the diastolic BP (Phase V Korotkoff) should be recorded to the nearest 2 mm. Ambulatory BP monitoring is useful in diagnosing white coat hypertension or widely varying BP or hypertension resistant to drug treatment.

Evaluation

6. Evaluation of a patient with hypertension is aimed at identifying other cardiovascular risk factors, detecting target organ damage & any secondary causes of hypertension. This is achieved by History, Physical examination & Investigations.

[a] History:- With regard to duration of hypertension, modifiable risk factors, family history of hypertension, premature CAD, history of angina, claudication, TIA, past history of MI/Strokes.

[b] Physical Examination:- With special attention to peripheral pulses, carotid/renal bruit, enlarged kidneys & fundus examination.

[c] Investigations- complete blood cell count, urinalysis. Blood glucose, serum creatinine, serum electrolytes, Serum lipid profile & 12 lead ECG & Chest radiograph.

7. Screening & diagnostic tests for secondary hypertension are indicated if there are features inappropriate for usual primary hypertension (Table 2)

Table 2 : Features of Inappropriate Hypertension

- Onset before age 20 or after age 50
- BP > 180/110 mmHg
- Target organ damage
- Abdominal bruit. Variable pressures with tachycardia & sweating
- Unprovoked hypokalaemia
- Poor response to therapy

Assessment of Risk

8. Based on evaluation as above an estimate of individuals cardiovascular disease risk is made. Three factors are taken into consideration, prior to institution of therapy.

[a] Level & duration of Blood pressure

[b] coronary risk factors / clinical cardiovascular disease.

[c] Evidence of target organ damage, hypertensive retinopathy gr 3 or 4, cordiomegaly on CXR, LVH on ECG, Impaired renal function, CVA.

Treatment goal

9. The target blood pressure after commencing treatment should be less than 140/90 mm Hg & lower if tolerated especially in those with diabetes mellitus. Optimal treatment of elevated BP has been shown to decrease morbidity and mortality i.e. fatal & nonfatal stroke , cardiac events & retard progression to end stage renal disease/cardiac failure

Life Style Modifications

10. Life style modifications are indicated in all patients if hypertension (Table 3) & may be the only therapy for persons with high normal BP. In Stage I hypertension (no evidence of diabetes mellitus or multiple risk factors) these measures should be tried for 6-12 months before resorting to drugs. However in Stage II & Stage III hypertension, immediate drug therapy along with life style modifications is indicated.

Table 3 : Life style Modifications

- Lose weight if overweight
- Limit alcohol intake (30 ml ethanol/day)
- Increase aerobic physical activity (30-45 minutes most days of the week)
- Reduce sodium intake (5G Salt/day)
- Adequate dietary Potassium (Fresh fruits, vegetables)
- Reduce dietary Saturated Fats & Cholesterol
- Stop smoking
- Relief of stress (relaxation & Biofeedback techniques)

Anti Hypertensive Drugs

11. In general there are six classes of drugs. Diuretics, Betablockers, Calcium channel blockers, ACE inhibitors, Alpha blockers & Angiotensin receptor antagonists. For each class of drug there are compelling indications & contraindications (Table 4) & the initial choice of drug can be from any of the group.

Table 4 : Antihypertensive drugs

Class of drug	Recommended indication	Contraindications
Alpha blockers	Prostatism	Urinary incontinence
ACE Inhibitors	Heart failure Diabetes mellitus	Pregnancy Bilateral Renal Artery Stenosis
Angiotensin receptor	As Above	As above

antagonists	[Where ACE inhibitors are indicated but not tolerated]	
Betablockers	Myocardial infarction, Angina	Asthma, COPD, heart block
Calcium channel blockers	Elderly, angina, COPD	Heart block, Heart failure (verapamil, Dltiazem)
Diuretics	Elderly	Gout

Treatment initiation and follow up

12. Single daily dose of a drug should be prescribed. If at 4 weeks BP is not satisfactorily reduced, dose should be increased (except thiazides). In more severe or complicated hypertension, drugs are added stepwise until BP is controlled. Most hypertensive people will require combinations of anti hypertensive therapy to achieve optimum control. Rational drug combinations include diuretics with betablockers, diuretics with ACE inhibitors, Betablockers with calcium antagonists, & Calcium antagonists with ACE inhibitors. Regular follow-up is essential to check drug compliance & look for target organ damage.

Step down therapy

13. An effort to decrease the dosage & number of anti hypertensive drugs should be considered after hypertension has been adequately controlled for atleast one year. Step down therapy is more often successful in patients who are adhering to life style modifications. These patients will however have to be subjected to periodic review after withdrawal of drugs.

Hypertensive crisis

14. Hypertensive crisis is a situation where there is severe hypertension (Diastolic BP > 140 mmHg) with grade 3 or 4 hypertensive retinopathy with neurologic, cardiac or renal compromise. This may be further divided into hypertensive emergencies which require immediate reductions of BP (reduction of

upto 25% mean arterial pressure within one hour) & urgencies which can be more slowly managed. IV Nitroprusside, IV Nitroglycerine, IV Labetolol) along with loop diuretics can be used. (For those with less immediate danger oral drugs may be used.) Sublingual Nifedipine is to be avoided.

Disposal

15. The following guidelines apply to officers, JCOs & ORs with hypertension. For Naval/Airforce personnel equivalent medical category will be used.

[a] High Normal BP: All cases (without target organ damage) will remain in SHAPE-I. They will be periodically monitored by the AMA along with institutions of life style modifications.

[b] Stage I hypertension & no target organ damage. All cases will be initially placed in temp cat P2 (T-24 weeks) after which they will be placed in Perm Cat P2.

[c] Stage II & Stage III hypertension

[i] All cases will be initially placed in temp Cat P3 (T-24). Subsequently, if hypertension is well controlled & target organ damage is limited to grade 2 hypertensive retinopathy, they can be upgraded to P2 (T-24) . If BP continues to be well controlled they will be placed in Perm Cat P2.

[ii] All patients with Stage II & Stage III hypertension with grade 3 or 4 hypertensive retinopathy, evidence of other target organ damage or multiple risk factors will be observed initially in Cat P3 (T-24) as above. Thereafter if BP is well controlled & if target organ damage does not progress. they can be placed in permanent medical category P3. Cases who respond poorly to drug therapy or in whom the target organ damage is progressive will be invalided out of service.

16. Upgradation to P1 will be considered in the following:-

[a] Only, cases without any target organ involvement or any evidence of decapitation documented to be normotensive for one year without drugs can be considered for up gradation to P 1 Sr Adv Cardiology/Medicine.

[b] Secondary hypertension - where definitive cure has been achieved & individual remains normotensive without any drug for one year.

[c] Such upgradations will be done by Senior Adviser in Cardiology/Medicine.