CVS diseases

Vasovagal syncope

Diagnostic tools

1. Syncope triggered by reduction in venous return due to

a) Prolonged standing

b) Excessive heat

c) Large meal

2. Head up tilt test -positive

Patient is asked to lie on a table that is then tilted to an angel of 60 to 70 degree for up to 45 minutes, while ECG & BP are monitored. A positive test is characterized by bradycardia and/ or hypotension associated with typical symptoms.

Management

1. Life style modifications

    i) Salt supplementation

    ii) Avoid prolonged standing

    iii) Correct dehydration

    iv) Avoid missing meal

2. Patient resistant to life style measure

    i) Fludrocortisone

    ii) Beta blocker

    iii) Disopyramide

3. Dual chamber pace maker if symptoms are due to bradycardia.

Acute left ventricular failure

Diagnostic tools

1. Diagnosed case of IHD or AKI or CKD, hypertension etc.

2. Patient complaint-sudden severe breathlessness, chest pain, cough-productive, sputum mucoid (may be blood stained).

3. On examination-pulse low volume, rapid; BP-usually low, cyanosis may be present; gallop rhythm may be present in left parasternal area and bilateral fine basal crepitation present.

4. Investigation-ECG may reveal IHD, CXR-features of pulmonary edema.

Management

1. Propped up position.

2. O2 high flow 4-6 L/minute via face mask.

3. Treatment of the underlying cause e.g. IHD (aspirin, carvidelol, atrovastatin).

4. Administer IV glyceryl trinitrate 10-200 µg/min or buccal GTN 2-5 mg titrated upwards every 10 min, until clinical improvement occurs or systolic BP falls to < 110 mm of Hg.

5. Injection frusemide IV (20 mg/2 ml) 2 amp IV stat then 1 amp IV at 8 AM and 4 PM. (Injection frusemide can be given more frequently).

6. IV opiates e.g. morphine; I.V. bolus doses of morphine sulfate (2.5-5 mg) can be considered and repeated as necessary.

7. Ionotropic agent- an intravenous infusion of an inotrope (e.g. dobutamine-2.5–10 µg/kg/min) should be considered in patients with hypotension (systolic blood pressure <85 mm Hg).

8. Insertion of intraaortic ballon pump-In patient with acute cardiogenic pulmonary edema and shock.

Monitoring of the patient with

a) Cardiac monitor (development of arrythmia)

b) BP & pulse oximetry

Chronic heart failure

Diagnostic tools

1. History of IHD, valvular heart disease.

2. Patients complaint of swelling of legs, SOB, cough.

3. On examination-leg edema, JVP raised and enlarged, tender liver; precordium examination may reveal features of underlying cause of CHF like valvular heart disease or IHD.

4. Investigation- ECG may reveal IHD, CXR-reveal cardiomegaly, echocardiogram confirm diagnosis and detailsfunction of the left ventricle.

Management

General measure

1. Education of the patient.

2. Diet

- Good general nutrition.

- Weight reducing diet for obese.

3. Alcohol

- Moderation or elimination.

- Abstinence in alcohol induced cardiomyopathy.

4. Smoking cessation.

5. Exercise - regular moderate aerobic exercise with in limit of symptoms.

6. Vaccinatuion- influenza & pneumococcal.

Pharmacologiocal therapy

1. Diuretic therapy-Frusemide oral or intravenous in patient with severe chronic HF particularly in presence of chronic renal impairment in which edema persist despite oral loop diuretics.

Aldosteron receptor antagonist e.g. spironolactone & eplerenone. They improve long term clinical outcome in patient with severe HF or HF following acute MI.

2. Vasodilator therapy- Nitrates in IHD.

3. ACEi-Can easily be started in otherwise stable patient & SBP>100 mm of Hg. In other patient diuretics should be stopped for 24 hours & then ACEi start at low dose.

ACEi	Starting dose	Target dose

i) Enalapril	2.5 mg 12 hourly	10 mg 12 hrly
ii) Ramipril	1.25 mg daily	10 mg daily.

4. ARB have similar effect to that of ACEi (should be given if ACEi cannot tolerate or side effects occurs)

Name	Starting dose	Target dose
Losarton	25 mg/day	100 mg/day.

5. Combined ACEi & ARB

Indication-HF patient in those with recurrent hospitalization for HF (better not given due to risk of hyperkalaemia)

6. Beta blocker therapy

More effective than ACEi in reducing mortality. Bisolol starting dose at 1.25 mg daily increase gradually over 12 weeks to a target maintainance dose of 10 mg daily.

Carvidelol 6.25-25 mg daily can be used.

7. Digoxin

To provide rate control and also in NYHA III, IV.

8. Amiodarone

- Effective in patient of symptomatic arrhythmia.

- Should not be used in asymptomatic arrhythmia.

Commonly used drugs in chronic heart failure

1. Oral or Injctable frusemide

2. ACEi

3. Beta blocker-bisoprolol or carvidelol

4. Treatment of the underlying cause commonly IHD (aspirin, carvidelol, atrovastatin)

Valvular heart disease

Diagnostic tools

1. Patient complaint-palpitation, SOB, cough.

2. On examination-

Mitral stenosis-pulse low volume, irregularly irregular if atrial fibrillation, mid diastolic murmur in mitral area.

Mitral regurgitation- pulse high volume, irregularly irregular if atrial fibrillation, pansystolic murmur in mitral area radiates to left axilla.

Aortic stenosis- pulse low volume, BP-low systolic and low diastolic (narrow pulse pressure), ejection systolic murmur in aortic area radiates to right side of the neck.

Aortic regurgitation- pulse high volume, BP-high systolic and low diastolic, early diastolic murmur in left parasternal area best heard in sitting and leaning forward position of the patient, breath hold in expiration, there may be a ejection (mid) systolic murmur present in aortic area.

Management

Medical management of all the valvular diseases is almost same

1. Diet- normal.

2. Avoid strenuous exercise.

3. O2 inhalation SOS.

4. Tab. Phenoxymethyl penicillin (250mg) 1 tab. 12 hourly (if rheumatic in origin).

5. Tab. Frusemide (40mg) (if patient complaint SOB and features of heart failure).

6. Tab. Digoxin 0.25mg 1 tab. at night for 6 doses in a week if fast atrial fibrillation.

7. Tab. Ecospirin (75mg) daily if atrial fibrillation.

8. In MR and AR- if systemic hypertension is present, it should be treated with vasodilators such as ACE inhibitors or ARBs.

Indication of surgery in mitral stenosis

1. Patient symptomatic despite medical treatment.

2. If pulmonary hypertension develops.

3. Severe mitral stenosis.

4. Pregnancy

2 types of surgery can performed in mitral stenosis

1. Valvuloplasty
2. Valve replacement

Indication of mitral valvuloplasty in mitral stenosis

1. Significant symptom

2. Isolated MS

3. No (trivial) MR

4. Mobile, non-calcified valve/ subvalve apparatus on echocardiogram.

5. Left atrium free of thrombus.

Indication of mitral valve replacement in mitral stenosis

1. MS with MR

2. Rigid & calcified mitral valve cups

Contraindication of surgery

1. Active rheumatic carditis

Mitral regurgitation

Indication of surgery in mitral regurgitation (surgery may be valve replacement or repair; mitral valve repair is now the treatment of choice for severe mitral regurgitation)

1. Worsening symptoms

2. Progressive cardiomegaly

3. Echocardiographic evidence of deteriorating left ventricular function.

Aortic stenosis

Indication of surgery in aortic stenosis

1. Development of angina

2. Development of syncope

3. Symptoms of low cardiac output

4. Heart failure

Patient with moderate to severe stenosis is evaluated every 1-2 year with doppler echocardiography to detect progression of severity.

Indication of surgery in aortic regurgitation

1. Symptomatic patient

2. Asymptomatic patient should be followed up annually with echocardiogram for evidence of increasing ventricular size, if this occurs or if the end systolic dimension increases to 55mm then aortic valve replacement should be undertaken.

Myocardial infarction

Diagnostic tools

For diagnosis any of the 2 criteria should be present.

1. Classical chest pain > 30 minutes.

2. ECG changes-ST elevation, new onset left bundle brunch block, evolution of 'Q' wave. Those changes may be isolated or in combination.

3. Biochemical markers-CK-MB >2 fold increase, increase Troponin I or T level. Troponin I positive confirms MI. (practically troponin I should be advised when ECG is normal but patient is highly suspected case of MI).

Management

Management-patient must be hospitalized in a CCU.

1. Complete bed rest

2. Diet- liquid to semisolid

3. O2 inhalation 4-6 L/minute

4. Sublingual glyceryl trinitrate 2 puff sublingually stat & SOS

5. Oral glyceryl trinitrate 2.6 mg at morning and evening

6. Tab. Aspirin 300 mg stat then 75 mg daily and a P2Y12 receptor antagonist ticagrelor for up to 12 months.(180 mg, followed by 90 mg twice daily) but prasugrel (60 mg, followed by 10 mg daily) is an alternative.(clopidogrel who cannot tolerate aspirin)

7. Intravenous β-blockers (atenolol 5–10 mg or metoprolol 5–15 mg given over 5 mins) relieve pain, reduce arrhythmias and improve short-term mortality in patients who present within 12 hours of the onset of symptoms. Avoid in heart failure (pulmonary oedema), hypotension (systolic BP < 105 mmHg) or bradycardia (heart rate < 65/min). Commonly we use oral metoprolol (50 to 100 mg/day) or bisoprolol (2.5 to 10 mg/day)

8. Enalapril (10 mg twice daily) or ramipril (2.5–5 mg twic daily).

9. Atrovastatin 10 mg/rosuvastatin 1 tab at night after meal

10. Inj. Morphine 5 mg iv stat. & SOS (may be repeated after 15 min.)

11. Metoclopropamide 10 mg or prochlorperazine 1 amp IM stat along with morphine

12. If patient present within 12 hours then primary PCI or thrombolysis with streptokinase or tenecteplase (TNK) or reteplase (rPA).

13. Management of risk factors e.g. cessation of smoking, control of hypertension, DM and dyslipidaemia etc.

15. Continuous monitoring with cardiac monitor, BP, pulse rate and rhythm.

Mobilization and rehabilitation

* In uncomplicated cases

    a) Seat on chair on 2nd day

    b) Walk to toilet on 3rd day

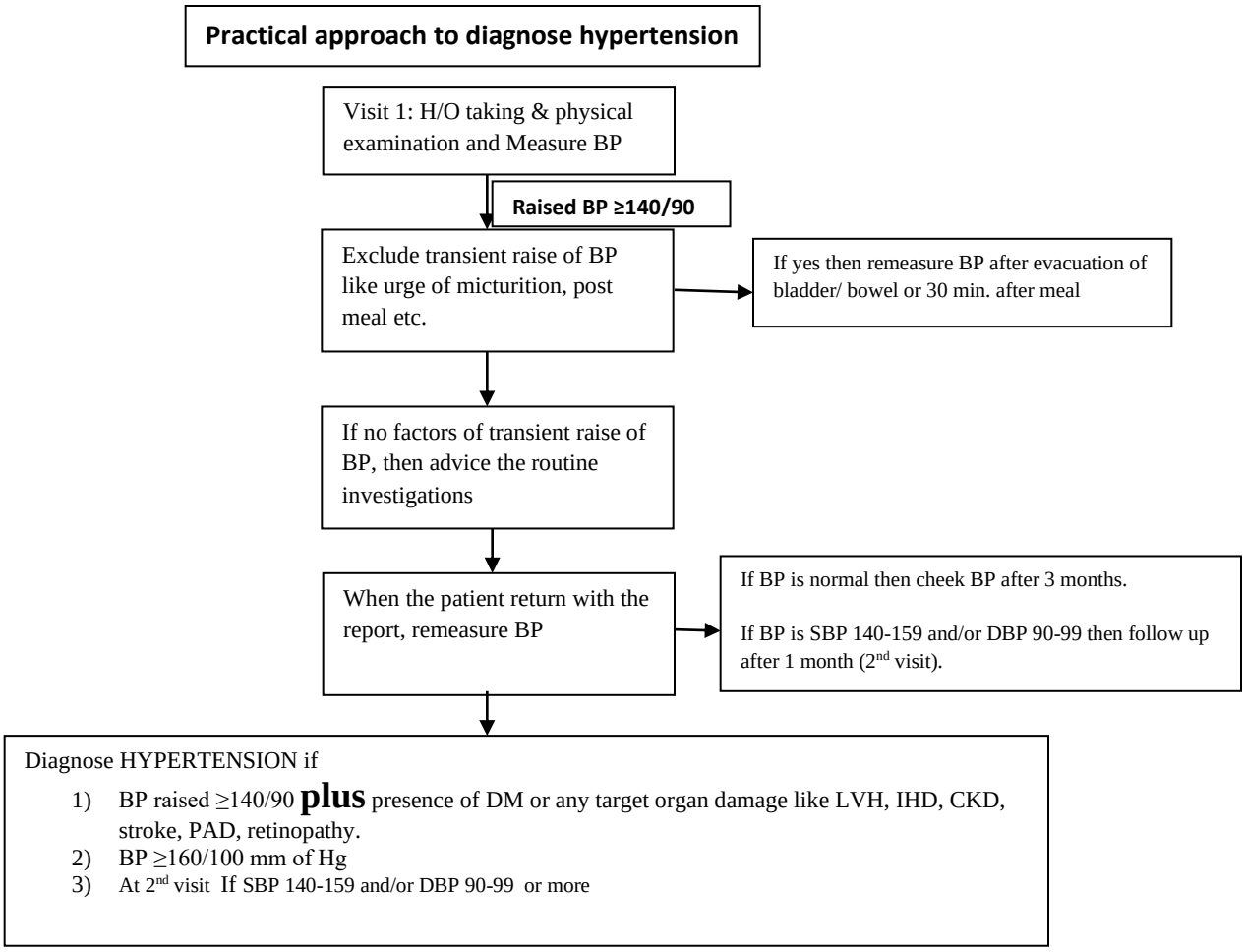
    c) Return to home on day 5th to 7th day.

    d) Gradually increasing activity & return to normal work in 4 to 6 week

* In complicated cases

Process of mobilization & rehabilitation varies & depends upon the patient's functional capacity.

Hypertension



Why blood pressure should be controlled?

If blood pressure is chronically elevated then complications of hypertension are inevitable. So it is mandatory to keep the

blood pressure control.

What is the management target of hypertension?

a) In general SBP <140 and DBP <90 mm of Hg

b) In DM SBP <130 and DBP <80 mm of Hg

c) In CKD SBP <120 and DBP <70 mm of Hg

d) In >60 years patient SBP <150 and DBP<90 mm of Hg.

Management of hypertension

2 components of management of hypertension

1. Dietary and life style measures

2. Pharmacological treatment

Who should offer dietary and life style measure?

1. In all hypertensive patient (this is the first and cornerstone of hypertension management).

2. In prehypertensive patient.

Who should offer only life style measure (no antihypertensive drug)?

In grade 1 hypertensive patient (SBP 140-159 and/or DBP 90-99) with no target organ damage with low risk of CVD (no DM, no dyslipidaemia, no past history of CAD, PAD, stroke etc). We may follow up the patient for up to 3 months. If the blood pressure is not controlled by this time then antihypertensive can be added.

Life style measures are

1. Maintain normal weight.

2. Physical activity.

3. Regular physical exercise (brisk walking for 30 minutes per day, ideally on most of the days of the week).

4. DASH (Dietary approach to stop hypertension).

    a. Reduce salt intake to < 100mmol/day (<6g NaCI day, 1 TSF).

    b. Consume fresh fruits and vegetables.

    c. Reduce the intake of total and saturated fat.

    d. Limit alcohol consumption to < 3 units/day for men and < 2 units/day for women).

    e. Stop smoking and SLT use.

    f. Increase intake of potassium, calcium and magnesium containing food.

Who should offer antihypertensive drugs in addition to life style measures?

1. Severe hypertension (SBP≥180 and/or DBP≥110).

2. Grade 2 hypertension (SBP≥160 and/or DBP≥100).

3. Grade 1 hypertension with target organ damage like IHD, stroke, CKD etc.

4. Grade 1 hypertension with high risk of CVD.

5. Grade 1 hypertension with no TOD with low risk of CVD and blood pressure not control despite non-pharmacological measures.

6. Grade 2 Isolated systolic hypertension ≥160/<90 mm Hg.

Algorithm for treatment of hypertension

Life style modifications

↓

Not at goal BP

↓

Initial drug choices

↓ ↓

Without compelling indications with compelling indications

Without compelling indications

↓ ↓

Stage 1 hypertension Stage 2 hypertension

Thiazide type diuretic 2 drug combination

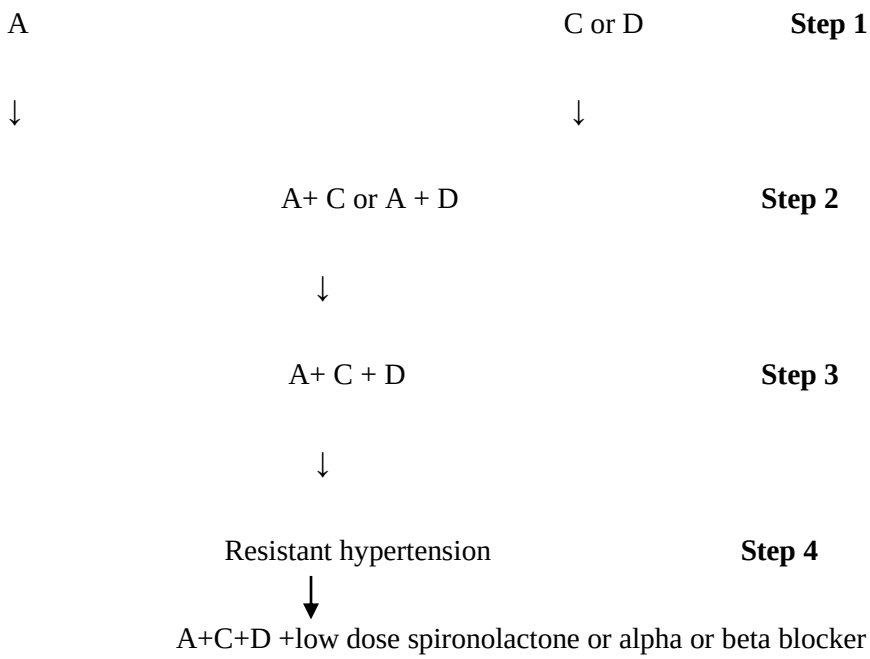
May consider ACEi, usually diuretic and

ARB, CCB. ACEi, ARB, CCB.

Alternative approach for Antihypertensive drug combination

< 55 years > 55 years or black patient of any age

↓ ↓



What are the factors need to consider before prescribing antihypertensive drug?

1. Age of the patient-antihypertensives that causes postural hypotension better to avoid in old age. Example ACEi, ARB betterto avoid in older age. Betablocker which causes erectile dysfunction, weight gain and hyperglycaemia better to avoid in young patient.

2. Sex of the patient-ACEi and ARB should be avoided in female patient of reproductive age. Because these drugs are teratogenic.

3. Predominant symptoms-if patient complaints of symptoms of sympathetic overactivity (e.g. palpittaion) then choice of antihypertensive should be beta blocker or rate limiting calcium channel blocker; dihydropyridine calcium channel blockers like amlodipine, nifedipine should be avoided (because those drug cause palpitation).

4. Target organ damage-presence of target organ damage is the cornerstone of selection of antihypertensive therapy. If patient have ischaemic heart disease (angina or MI) then betablocker and calcium channel blocker should be choose due to their potential role in IHD (decrease cardiac work load).

5. Co-morbidity-ask the patient whether he/she has Asthma, DM, CKD, PAD, pregnancy etc.

-In asthma patient beta blocker should be avoided due to its bronchoconstriction effect, choice of drug should be CCB, ARB, diuretic or ACEi.

-In DM patient it is better to give ARB or ACEi due to its potential role in prevention of progression of diabetic nephropathy.

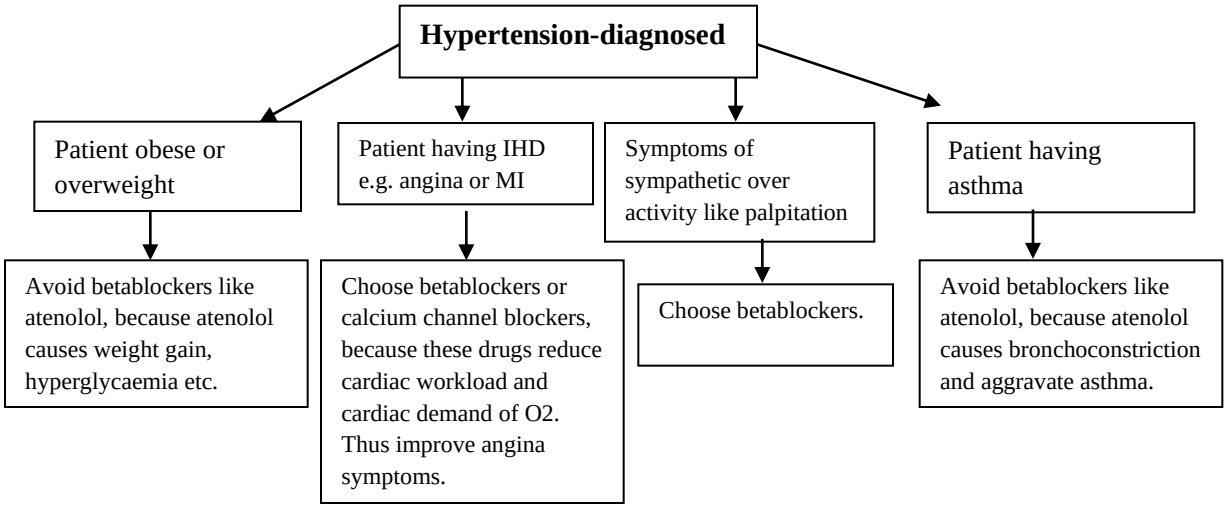
-In CKD (except in advanced stage, ACEi & ARB cause hyperkalaemia and increase risk of sudden death in CKD) ACEi, ARB should be given, in advanced stage CCB, beta blockers, alpha blocker, frusemide can be given.

-In PAD beta blocker should be avoided.

-In pregnancy ACEi & ARB should be avoided due to its teratogenecity, diuretic should be avoided due to it reduce the amount of amniotic fluid. Choices of antihypertensive during pregnancy are alpha methyldopa followed by calcium channel blocker, followed by beta-blocker.

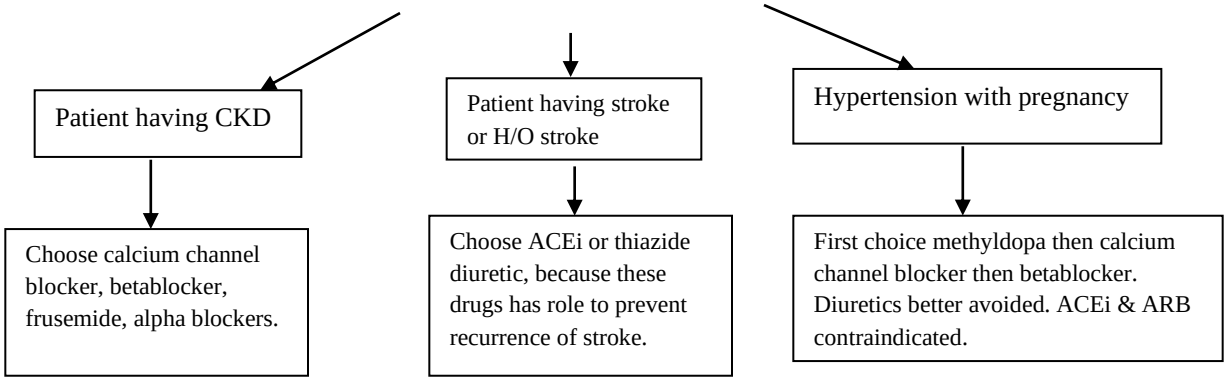
6. Overweight & obesity-it is better to avoid beta blocker in overweight and obese patient. Because this drug cause hyperglycemia and weight gain.

7. Cost of the antihypertensive drug-this is very important, because antihypertensive drug usually should be taken for lifelong period, so prescription of low cost drug will increase patient compliance and adherence to drug. Remember "it is not important what drug is patient taking, it is important whether blood pressure is controlled or not."



Practical approach to select antihypertensive drugs (contd.)

Hypertension-diagnosed



Case history: Mr. Ronjit Barmon 35 years, male incidentally found to have blood pressure 150/98 mm of Hg, on repeat measurement he had same blood pressure. He is non-smoker, no family history of hypertension and IHD. On examination he is over weight (BMI 28 kg/m2). He has no target organ damage.

a) What should be the management of his high blood pressure?

Answer: Only dietary and lifestyle modification and follow up.

Explanation: Mr. Ronjit Barmon had stage 1 hypertension, no TOD, no other cardiovascular risk factor but he is overweight. So he needs only life style modification (no antihypertensive drug). If his weight can be reduced his blood pressure will become normal.

How you will decide whether single or 2 drug or triple drug should be the initial therapy for newly diagnosed hypertensive patient?

1. Single drug- if grade 1 hypertension.

2. Two drugs (among them one should be diuretic)- usually if patient have stage 2 hypertension (BP≥ 160/100 mm of Hg).

3. Three drugs- if patient have severe hypertension≥180/110, he should start 3 or more drugs.

When the dose of the antihypertensive drug should be increased or another drug should be added?

If blood pressure is not controlled after 1 month of starting of antihypertensive drug then dose may be increased or another drug can be added. (Note: antihypertensive drug needs at least 2 weeks time to get maximum effect).

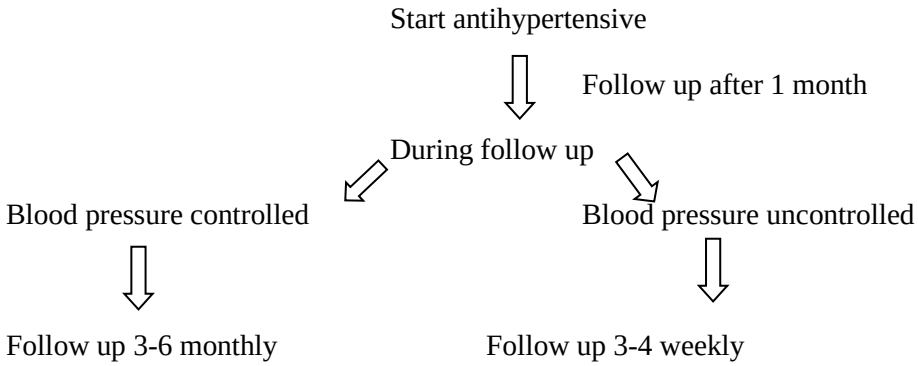
Common antihypertensive drugs and their doses

	Generic name	Doses	Common side effects
ACEi	Enalapril	Daily at night	Dry cough
	Ramipril	Daily at night	Dry cough
ARB	Losartan potassium	Daily at night	Postural hypotension
	Valsartan 40- 160 mg daily	Daily at night	Postural hypotension
	Olmesartan	Daily at night	Postural hypotension
Betablockers	Atenolol	Daily at morning	Weight gain, hyperglycaemia
	Bisoprolol	Daily at morning	Safer BB than atenolol, less metabolic side effects
Calcium channel blockers	Amlodipine	Daily at night	Palpitation, edema
	Nifedipine	1-3 times daily	Palpitation
	Lacidipine	Daily at morning	Palpitation
	Diltiazem	1-2 times daily	Bradycardia
	Verapamil	1-2 times daily	Bradycardia, constipation

Diuretics	Hydrochlorothiazide and amiloride hydrochloride	Daily at morning	Hyperuricaemia, hyponatraemia
	Frusemide	Daily at morning	Hyponatraemia
	Spironolactone	Daily at morning	Gynaecomastia, hyperkalaemia
Methyldopa	Methyldopa	2 Tab. One to 4 times daily	Headache, sedation
Carvedilol	Carvedilol (choose in heart failure)	1 to 2 times daily	Bradycardia
Alpha blocker	Prazosin	2 to 3 times daily (maximum 20 mg daily)	Postural hypotension
Alpha-Beta blockers	Labetelol	1 to 2 times daily (maximum 800 mg daily)	Postural hypotension
Atenolol + Amlodipine		Once daily	
Atenlol +Nifedipine		Once daily	
Losartan potassium + hydrochlorthiazide		Daily at morning	
Olmesartan + Amlodipine		Once daily	
Valsartan + Amlodipine		Once daily	
Benazepril +		Once daily	

Amlodipine			

What should be the follow up interval of hypertensive patient?



Who require more frequent follow up?

Patient with severe hypertension, hypertensive urgency, hypertensive emergency require more frequent follow up (after 7 days). Hypertensive emergency patient should be treated in hospital.

Following advice can be given to a hypertensive patient

Dc‡`k (nvB †cÖmv‡ii †ivMxi Rb¨)

1) Wv³v‡ii civgk© Qvov †cÖmv‡ii Ilya eÜ Ki‡eb bv |
2) aygcvb/ZvgvK/R`©v/¸j e¨envi Ki‡eb bv |
3) Pwe© RvZxq Lvevi †hgb - Miæi gvsm, Lvwki gvsm, wPsox gvQ, `y‡ai mi Kg Lv‡eb|
4) cÖwZw`b 30 wgwbU nvU‡eb | ওজন কমাবেন।
5) cÖPzi cwigv‡b kvK-meRx Lv‡eb |
6) cv‡Z jeb Lv‡eb bv |
7) gvbwmK Pvc cwinvi Ki‡eb |
8) ‡cÖmvi 140/90 Gi Kg _vK‡j eyS‡eb Avcbvi †cÖmvi wbqš¿‡b Av‡Q |
9) †cÖmvi wbqš¿‡b _vK‡j 3-6 gvm ci ci , wbqš¿‡b bv _vK‡j 1 gvm ci ci Wv³v‡ii civgk© wb‡eb |
10) †cÖmvi wbqš¿‡b bv _vK‡j nvU© A¨vUvK, wKWbx †dBji, †óªvK, AÜZ¡ mn Av‡iv A‡bK RwUj mgm¨v n‡Z cv‡i |
11) eQ‡i Aন্তত GKevi Wvqv‡ewUm, wKWbx, nvU© I Pwe©i পরীক্ষা Ki‡eb |