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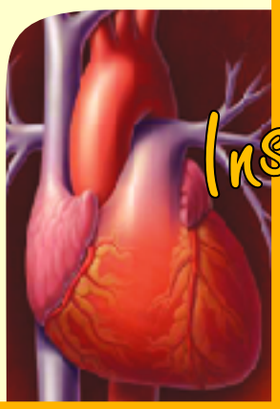
Inaugural Issue



Insight HEART

SQUARE
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Vol: 1 No : 1 ; Quarter-2, 2005

Accurate Blood Pressure Measurement in Practice

To define hypertension accurate blood pressure mesurement is very important. But often we do not know how to do it properly. Here is some suggessions to make it accurate:

- Mercury sphygmomanometer is the standard. Other devices, if used, should be calibrated frequently and routinely against such standard (every 6 months).
- Measure sitting blood pressure routinely; standing blood pressure should be recorded at least at the initial estimation in elderly or diabetic patients.
- Patients should be seated quietly for at least 5 minutes in chair rather than on an examination table with feet on the floor and arm supported at heart level.
- Remove tight clothing, support arm at heart level, ensure arm relaxed and avoid talking during the measurement procedure.
- Patients should be abstained from drinking caffeine or alcohol containing beverages or tobacco within 30 minutes before BP measurement.
- An appropriate size cuff (cuff bladder encircling at least 80% of the arm) should be used. In obese or muscular persons with midhumerous circumference greater than 38cm, a larger adult cuff is required. In very large individuals, the thigh cuff is often necessary. Using too large a cuff results in an underestimation of BP; similarly too small a cuff will lead to overestimation.
- The pick inflation level of the mercury column should be determined by using palpation of the radial artery before the stethoscope placed and cuff should be inflated 20 mmHg higher then the pressure at which the palpable pulse at the radial artery disappears.
- Centering the bladder of the cuff over the brachial artery with its lower edge within 2.5cm of the anticubital fossa and the stethoscope head should not touch the cuff.
- Minimum pressure should be exerted on the skin by the stethoscope so that there will be no lasting indentations in the area where the head of the stethoscope was placed; otherwise systolic BP is likely to be overestimated and the diastolic BP to be underestimated .
- Lower mercury column slowly (2 mm per second) Read blood pressure to the nearest 2 mm Hg. Terminal digit preference should be avoided.
- Measure diastolic blood pressure as disappearance of sounds (phase V)
- Take the mean of at least two readings (1-2 minutes apart), more recordings are needed if marked differences (>10 mm Hg) between initial measurements are found. Patients with atrial fibrillation several measurements and multiple readings are recommended.
- Measurements of BP in both arms typically are obtained at the initial visit, and the arm with the higher BP is used thereafter if the difference is greater then 10/5 mm Hg.
- Do not treat on the basis of an isolated reading

All adults should have blood pressure measured routinely at least every five years until the age of 80 years. People with “high normal” systolic blood pressure (130-139 mm Hg) or diastolic blood pressure (85-89 mm Hg) and people who have had high blood pressure readings at any time previously should have their blood pressure measured annually.

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Vol: 1 No : 1 ; Quarter-2, 2005

Hypertension Management: An Update

Definition of hypertension;

Blood Pressure is a continuous variable, and whatever number is used to define hypertension will be arbitrary. One practical definition is that "the level of BP at which the benefits of treatment outweigh the costs and hazards"

Classification:

The classification is based on the average of two or more properly measured, seated BP readings on each of two or more office visits.

In table 1 classification by British Hypertension Society and in table 2 classification by JNC 7 is given .

Patients with prehypertension are at increased risk for progression to hypertension; those in the 130-139/80-89 mmHg BP range are at twice the risk to develop hypertension as those with lower values.

Table1. Classification : British Hypertension Society

Category	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Blood pressure		
Optimal	<120	<80
Normal	<130	<85
High normal	130-139	85-89
Hypertension		
Grade 1 (mild)	140-159	90-99
Grade 2 (moderate)	160-179	100-109
Grade 3 (severe)	180	110
Isolated systolic hypertension		
Grade 1	140-159	<90
Grade 2	160	<90

This classification equates with those of the European Society of Hypertension and the World Health Organization-International Society of Hypertension and is based on clinic blood pressure and not values for ambulatory blood pressure measurement. Threshold blood pressure levels for the diagnosis of hypertension using self/home monitoring are greater than 135/85 mm Hg. For ambulatory monitoring 24 hour values are greater than 125/80 mm Hg. If systolic blood pressure and diastolic blood pressure fall into different categories the higher value should be taken for classification.

Cardiovascular disease risk

The relationship between BP and risk of CVD events is continuous, consistent, and independent of other risk factors. The higher the BP, the greater is the chance of heart attack, heart failure, stroke, and kidney disease. For individuals 40-70 years of age, each increment of 20 mmHg in systolic BP (SBP) or 10 mmHg in diastolic BP (DBP) doubles the risk of CVD across the entire BP range from 115/75 to 185/115 mmHg.

Risk associated with hypertension

- Cerebrovascular disease
- Coronary artery disease
- Heart failure
- Renal insufficiency
- Peripheral vascular disease
- Premature mortality

Benefits of lowering blood pressure

Antihypertensive therapy reduces stroke incidence

Table 2. Classification and Management of Blood Pressure for Adults Aged 18 Years Older

BP Classification	Systolic BP, mm Hg*		Diastolic BP, mm Hg*	Lifestyle Modification	Management* — Initial Drug Therapy: Without Compelling Indication	Management* — Initial Drug Therapy: With Compelling Indications†
Normal	<120	and	<80	Encourage		
Prehypertension	120-139	or	80-89	Yes	No anti hypertensive drug indicated	Drug(s) for the compelling indications†
Stage1hypertension	140-159	or	90-99	Yes	Thiazide-type diuretics for most: may consider ACE inhibitor, ARB, β-blocker,CCB, or combination	Drug(s) for the compelliing indications Other anti hypertensive drugs (diuretics,ACE inhibitor,ARB, β- blocker, CCB) as needed
Stage 2 hypertension	≥160	or	≥100	Yes	2- Drug combination for most: (usually thiazide-type diuretic and ACE inhibitor or ARB or β- blocker or CCB)§	Drug(s) for the compelliing indications Other anti hypertensive drugs (diuretics,ACE inhibitor,ARB, β- blocker, CCB) as needed

Abbreviations: ACE, angiotensin-converting enzyme; ARB, angiotensin-receptor blocker;BP, blood pressure; CCB, calcium channel blocker.
* Treatment determined by highest BP category.
† See the table 4
† Treat patients with chronic kidney disease or diabetes to BP goal of less then 130/80 mm Hg.
§ Initail combined therapy should be used cautiously in those at risk for othostatic hypertension

averaging 35-40%; myocardial infarction, 20-25%; and heart failure, more than 50%. In patients with stage 1 hypertension (SBP 140-159 mmHg and/or DBP 90-99 mmHg) and additional CV risk factors, achieving a sustained 12 mmHg reduction in SBP over 10 years will prevent 1 death for every 11 patients. In the presence of CVD or target organ damage, only 9 patients would require such BP reduction to prevent a death.

Home/Self blood pressure monitoring:

British Hypertension Society strongly recommends the proper use of validated, accurate and well maintained monitors with appropriate cuff-size. And the measurement should be done under standardized condition.

The potential advantages of home BP monitoring include the availability of multiple record through out the waking period taken over many days, which may reduce white coat affect and misinterpretation of measurement variability. Importantly, home BP measurement also involves the patient more closely in management of their own BP. Values from the home management tends to be lower than the clinical levels. Consequently thresholds and targets based on this technique should probably be adjusted downwards (by 10/5 mm of Hg). The disadvantages of this technique include reporting bias and unsupervised alteration of medication. Patients should measure their BP in a fixed time of the day and should record all the readings obtain.

Ambulatory blood pressure monitoring

Ambulatory blood pressure monitoring (ABPM) is warranted for evaluation of "white-coat" hypertension in the absence of target organ injury. It is also helpful to assess patients with apparent drug resistance, hypotensive symptoms with anti hypertensive medications, episodic hypertension and autonomic dysfunction. The ambulatory BP values are usually lower than clinic readings. The level of BP measurement by using ABPM correlates better than office measurements with target organ injury.

Indications for ambulatory blood pressure monitoring

- Unusual variability of blood pressure
- Possible white coat hypertension
- Informing equivocal treatment decisions
- Evaluation of nocturnal hypertension
- Evaluation of drug resistant hypertension
- Determining the efficacy of drug treatment over 24 hours
- Diagnosis and treatment of hypertension in pregnancy
- Evaluation of symptomatic hypotension

Evaluation of hypertensive patients

All hypertensive patients should have a thorough history and physical examination but need only a limited number of routine investigations

Evaluation of hypertensive patients

Causes of hypertension

- Drugs (non-steroidal anti-inflammatory drugs, oral contraceptives, steroids, liquorice, sympathomimetics, some cold cures)
- Renal disease (present, past, or family history, proteinuria or haematuria: palpable kidney(s)-polycystic, hydronephrosis, or neoplasm)
- Renovascular disease (abdominal or loin bruit)
- Phaeochromocytoma (paroxysmal symptoms)
- Conn's syndrome (tetany, muscle weakness, polyuria, hypokalaemia)
- Coarctation (radio-femoral delay or weak femoral pulses).
- Cushing's / Syndrome (general appearance)

Contributory factors

- Overweight
- Excess alcohol (> 3 units/day for men; > 2 units/day for women)
- Excess salt intake
- Lack of exercise
- Environmental stress

Complications of hypertension or target organ damage

- Stroke, transient ischaemic attack, dementia, carotid bruits
- Left ventricular hypertrophy or left ventricular strain on electrocardiogram
- Heart failure
- Myocardial Infarction ; angina, coronary artery bypass graft, or angioplasty
- Peripheral vascular disease
- Fundal haemorrhages or exudates, papillodoema
- Proteinuria
- Renal impairment (raised serum creatinine)

Risk factors for cardiovascular disease

- Smoking
- Diabetes
- Ratio of total cholesterol: HDL cholesterol
- Family history
- Age
- Sex

Routine investigations

- Urine strip test for protein and blood
- Serum creatinine and electrolytes
- Blood glucose—ideally fasted
- Blood lipid profile (at least total and high density lipoprotein (HDL) cholesterol)—ideally fasted for consideration of triglycerides
- Electrocardiogram
- Haematocrit
- Serum Calcium

Target of blood pressure

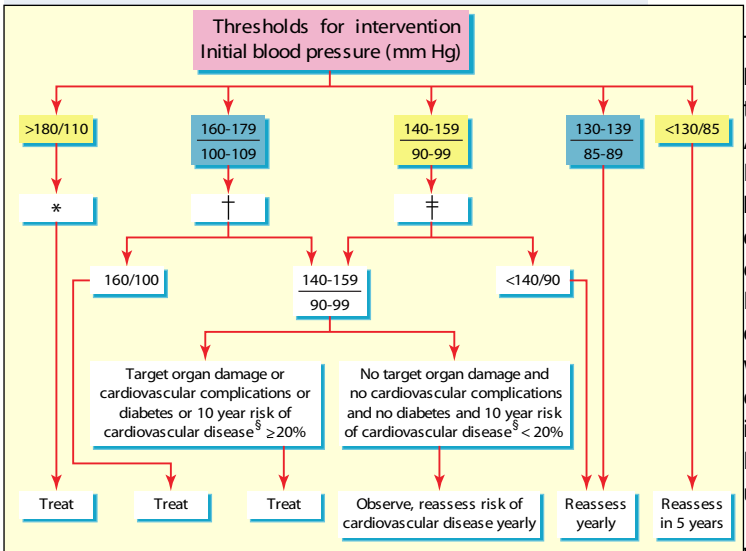
Definitive evidence on optimal targets for blood pressure lowering is lacking. The hypertension optimal treatment (HOT) trial was underpowered but to date, still provides the best evidence on optimal targets. Since most persons with hypertension, especially those age >50 years, will reach the DBP goal once SBP is at goal, the primary focus should be on achieving the SBP goal. Table 3 shows goal of BP in different situations.

Table 3 - Target blood pressures

Population of Hypertensives	Goal blood pressure
Uncomplicated (no diabetes, cardiovascular or renal complications)	<140/90 mm Hg
Renal disease (elevated serum creatinine or proteinuria)	<130/80 mm Hg
Diabetics	<130/80 mm Hg
Cardiovascular complications	<130/85 mm Hg

Thresholds of starting treatment

JNC 7 report recommended to start lifestyle modification to all hypertensive & pre-hypertensive patients and to start treatment with pharmacological therapy when the target BP is not reached by lifestyle modification. Recommendations from BHS is given in Figure below .



* Unless malignant phase of hypertensive emergency confirm over 1-2 weeks then treat
† If cardiovascular complications, target organ damage, or diabetes is present, confirm over 3-4 weeks then treat; If absent remeasure weekly and treat if blood pressure persists at these levels over 4-12 weeks
‡ If cardiovascular complications, target organ damage, or diabetes is present, confirm over 12 weeks then treat; If absent remeasure monthly and treat if these levels are maintained and if estimated 10 year cardiovascular disease risk is ≥ 20%
§ Assessed with risk chart for cardiovascular disease

Treatment

Lifestyle Modifications

Adoption of healthy lifestyles is an indispensable part of the management. Major lifestyle modifications include weight reduction, diet rich in potassium and calcium, dietary sodium reduction, physical activity, and moderation of alcohol consumption. It reduce BP, enhance drug efficacy, and decrease cardiovascular risk. For example, a 1,600 mg sodium reduction has effects similar to single drug therapy. Some mesures for life style modification are given below:

- Maintain normal weight for adults (BMI 20-25 kg/m^2)
- Salt intake <100 mmol/day (<6 g NaCl or <2.4 g Na /day)
- Alcohol 3 units/day for men & 2 units/day for women
- Regular aerobic physical exercise (brisk walking rather than weightlifting) for 30 minutes/ day, ideally on most of days of the week but at least on 3days/week
- At least five portions/day of fresh fruit and vegetables
- Reduce the intake of total and saturated fat

Pharmacologic Treatment

Lowering BP with several classes of drugs, including angiotensin converting enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs), beta-blockers (BBs), calcium channel blockers (CCBs), and thiazide-type diuretics, reduce the complications of hypertension.

Thiazide-type diuretics have been the basis of anti hypertensive therapy in most outcome trials. In these trials, including the recently published Antihypertensive and Lipid Lowering Treatment to Prevent Heart Attack Trial (ALLHAT), diuretics have been virtually unsurpassed in preventing the cardiovascular complications of hypertension. The exception is the Second Australian National Blood Pressure trial which reported slightly better outcomes in White men with a regimen that began with an ACEI compared to a diuretic. Diuretics enhance the efficacy of multidrug regimens, useful in achieving BP control, and are more affordable. Despite these findings, diuretics remain underutilized.

Which should be the initial drug of choice?

Three very recent clinical trials are of special interest in this regard. Compare to an initial diuretic, an initial ACE inhibitors was not

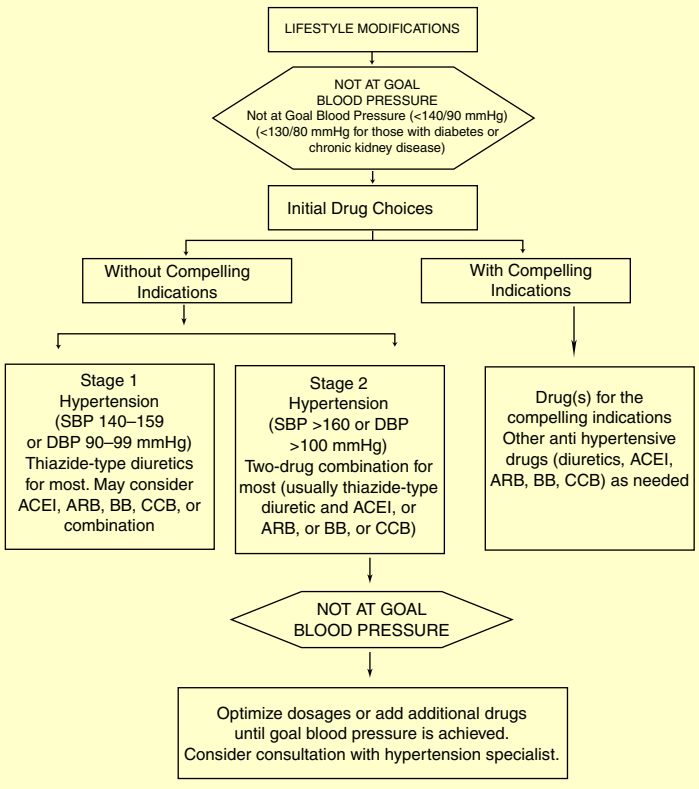
significantly superior in preventing a first cardiovascular event or death in the 2nd Australian National Blood Pressure Trial (ANBPT-2). An initial ARB (± Diuretics) was superior to beta blocker (± Diuretics) in patients with LVH for reducing major cardiovascular events. In LIFE trial: Losartan lower systolic BP & major reduction in stroke, but there are no reduction in CHD events or death.

Perhaps most importantly, the recent ALLHAT study directly compare thiazide like diuretics, chlorthelidone with three newer anti hypertensive drugs: amlodipin (a CCB), doxazosin (an alfa blocker) and lisinopril (an ACE inhibitor). The doxazosin arm was stopped early and showed a significant increase (compare to diuretics) in CVD, CHD, heart failure and peripheral arterial disease. Although there is no significant differences between and either of the remaining two newer drugs, in the primary end point (CHD death or non-fatal MI), the diuretics was significantly better in preventing heart failure than both and also better in reducing BP, stroke and CV events than lisinopril. On racial variation diuretic was proved color-blind. In both racial sub-groups (blacks and non-blacks) neither the ACE inhibitor nor the CCB was more effective than the thiazide diuretics in preventing the primary outcome of MI or fatal CHD or any other major cardiovascular or renal outcomes. It was more effective in BP reduction, prevention of heart failure than the other two newer drugs. Blacks receiving lisinopril had significantly increased risk of stroke and combined CVD outcome. Because of it's superiority in preventing one or more CV complications and effective in both racial group and it's lower cost, a thiazide diuretics was recommended as the only preferred initial anti hypertensive drug therapy by the ALLHAT research group.

Table 4. Compelling Indications for Individual Drug Classes

High-Risk Conditions With Compelling Indication	Recommended Drugs					
	Diuretic	β-Blocker	ACE Inhibitor	ARB	CCB	Aldosterone Antagonist
Heart failure	●	●	●	●		●
Post-myocardial infarction		●	●			●
High coronary disease risk	●	●	●		●	
Diabetes	●	●	●	●	●	
Chronic kidney disease			●	●		
Recurrent stroke prevention	●		●			

Algorithm for treatment of hypertension



Compelling Indications

Table 4 describes compelling indications that require certain anti hypertensive drug classes for high-risk conditions. A combination of agents may be required. Other management considerations include medications already in use, tolerability, and desired BP targets.

Follow-up and Monitoring

Once anti hypertensive drug therapy is initiated, most patients should return for followup at approximately monthly intervals until the BP goal is reached. More frequent visits will be necessary for patients with stage 2 hypertension or with complicating comorbid conditions. Serum potassium and creatinine should be monitored at least 1–2 times/year. After BP is at goal and stable, followup visits can usually be at 3 to 6 month intervals. Other cardiovascular risk factors should be treated to their respective goals, and tobacco avoidance should be promoted vigorously. Low-dose aspirin therapy should be considered only when BP is controlled, because the risk of hemorrhagic stroke is increased in patients with uncontrolled hypertension.

Source: 1.National High Blood Pressure Education Program Prevention, Detection, Evaluation, and Treatment of High Blood PressureThe Seventh Report of the Joint NationalCommittee. 2. British Hypertension Society guidelines for hypertension management 2004 (BHS-IV)

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Hypertension in Pregnancy

Hypertensive disorders during pregnancy are one of the leading cause of maternal mortality. Expectant mothers with hypertension are predisposed to the development of potentially lethal complications, notably abruptio placentae, DIC, cerebral hemorrhage, hepatic failure, and acute renal failure.

CLASSIFICATION

- **Chronic hypertension :** Hypertension that is present and observable before pregnancy or that is diagnosed before the 20th week of gestation or if only measured after 20 weeks' of gestation, persisting 6 weeks post-partum.

- **Pre-eclampsia-eclampsia:** It is usually diagnosed on the basis of hypertension with protenuria as defined bellow:
  1. Hypertension defined as SBP >140 or DBP >90 after 20 weeks in a woman who was normotensive before 20 weeks of gestation.
  2. Protenuria defined as 300mg/L protein, 30mg/mmol creatinine in a random specimen, or an excretion of 300mg/24 hours.

- **Pre-eclampsia superimposed upon chronic hypertension :** It is likely in women with preexisting hypertension & no proteinuria (<20 weeks) with new-onset proteinuria, or in women with known hypertension and proteinuria (<20 weeks) who have sudden increase in BP or proteinuria, thrombocytopenia (platelet <100,000 cells/mm), or increase in ALT or AST.

- **Gestational hypertension:**
  1. Transient hypertension in pregnancy if pre-eclampsia is not present at the time of delivery and blood pressure returns to normal by 12 weeks postpartum or
  2. Chronic hypertension if the elevation persists.

CHRONIC HYPERTENSION IN PREGNANCY

Prepregnancy counseling

Women with a history of hypertension with target organ damage should be advised that pregnancy may exacerbate the condition. The risks of fetal loss and accelerated deterioration of maternal renal disease are increased if serum creatinine is above 1.4 mg/dL at conception. Chronic hypertension before pregnancy requires planning for lifestyle changes. For example, pregnant women with hypertension may need to restrict their activities at work and home and refrain from vigorous exercise. Weight reduction during pregnancy, even in obese women, is not recommended.

Benefits of Lowering BP in pregnancy

Meta-analysis of trails of anti-hypertensive drugs shows a reduction in the risk of progression to severe hypertension and fewer hospital admissions. There is little evidence that treatment reduces the risk of developing of pre-eclampsia or improves fetal outcomes, although effective control of severe hypertension may buy more gestational time before delivery become necessary.

Threshold/Target of Treatment

Firm evidences are not available on the optimal threshold for treatment. However, there is consensus for initiating treatment at BP level exceeding 150-160 SBP or 100-110 mmHg DBP or in the presence of TOD. The target of BP is not well defined but probably maintain DBP between 80-100 mmHg.

Antihypertensive Drug Selection

Methyldopa is preferred as first-line therapy, as it has stable uteroplacental blood flow and fetal hemodynamics. CCBs (especially long acting formulation of nifedipine) & the vasodialator hydralazine are commonly used as second line drugs. Labatolol (alfa & beta blockers) is also widely used as the second line agent, particularly for resistance hypertension in 3rd trimester. Other beta blockers are less often, because they particularly inhibit fetal growth. Meta-analysis of controlled trails of thiazide/thiazide like diuretics has suggested a reduced incidence of pre-eclampsia. In practice thiazide/thiazide like diuretics has used little for the management of the hypertension, since on theoretical grounds, they have the potential to further reduce the already decreased circulatory blood volume in women with pre-eclamsia. However there is no proof that low dose thiazide/thiazide like diuretics in women in pre-existing are harmful and they may be continued through pregnancy.
Angiotensin-converting enzyme inhibitors & ARBs are contraindicated during pregnancy because of associations with fetal growth restriction, oligohydramnios, neonatal renal failure, and neonatal death and should be avoided in women who are likely to become pregnant.

Source:Working Group Report On High Blood Pressure, National High Blood Pressure Education Program; NIH Publication No. 00-3029, Originally Printed 1990 Revised July 2000

Hypertension in Children

Definition

Hypertension is defined as average SBP and/or DBP that is greater than or equal to the 95th percentile for sex, age, and height on three or more occasions. Prehypertension in children is defined as average SBP or DBP levels that are greater than or equal to the 90th percentile, but less than the 95th percentile.

As with adults, adolescents with BP levels greater than or equal to 120/80 mmHg should be considered prehypertensive. A patient with BP levels above the 95th percentile in a physician's office or clinic, who is normotensive outside a clinical setting, has white-coat hypertension.

Measurement of Blood Pressure in Children

Children >3 years old who are seen in a medical setting should have their BP measured. The preferred method of BP measurement is auscultation. Correct measurement requires a cuff that is appropriate to the size of the child's upper arm. Once hypertension is confirmed, BP should be measured in both arms and in a leg. Measures obtained by oscillometric devices that exceed the 90th percentile should be repeated by auscultation. Elevated BP must be confirmed on repeated visits.

In children <3 years having following conditions BP should be mesured:

- History of prematurity, very low birthweight, or other neonatal complication requiring intensive care
- Congenital heart disease (repaired or non-repaired)
- Recurrent UTIs, hematuria, or proteinuria
- Known renal disease or urologic malformations
- Family history of congenital renal disease
- Solid organ transplant
- Malignancy or bone marrow transplant
- Treatment with drugs known to raise BP
- Other systemic illnesses associated with hypertension
- Evidence of elevated intracranial pressure

Blood Pressure Tables

BP standards based on sex, age, and height provide a precise classification of BP according to body size. The revised BP tables now include the 50th, 90th, 95th, and 99th percentiles (with standard deviations) by sex, age, and height. The table could not produce here because of the limitation of space.

Primary Hypertension and Evaluation for Comorbidities

Both hypertension and prehypertension has strong association with overweight. The evaluation of hypertensive children should include assessment for additional risk factors.

Evaluation for Secondary Hypertension

Secondary hypertension is more common in children than in adults. Very young children, children with Stage 2 hypertension, and children or adolescents with clinical signs that suggest systemic conditions associated with hypertension should be evaluated more completely.

Target-Organ Abnormalities

Target-organ abnormalities are common in children and adolescents. LVH is the most prominent evidence of target-organ damage. Children with established hypertension should have echocardiographic assessment of left ventricular mass at diagnosis and periodically thereafter. LVH is an indication to initiate or intensify therapy.

Therapeutic Lifestyle Changes

Weight reduction is the primary therapy for obesity-related hypertension. Regular physical activity and restriction of sedentary activity will improve efforts at weight management and may prevent an excess increase in BP over time. Dietary modification should be strongly encouraged. Family-based intervention improves success.

Pharmacologic Therapy of Childhood Hypertension

Pharmacologic Therapy is indicated in symptomatic hypertension, secondary hypertension, hypertensive target-organ damage, diabetes, persistent hypertension despite nonpharmacologic measures.

Recent clinical trials have expanded the number of drugs that have pediatric dosing information. Pharmacologic therapy should be initiated with a single drug. Acceptable drug classes for use in children include ACE inhibitors, angiotensin receptor blockers, beta-blockers, calcium channel blockers, and diuretics. The goal for antihypertensive treatment in children should be reduction of BP to <95th percentile, unless concurrent conditions are present. In that case, BP should be lowered to <90th percentile. Severe, symptomatic hypertension should be treated with intravenous antihypertensive drugs.

Source:The fourth report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents; National High Blood Pressure Education Program,Revised April 2005

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Hypertension News

Hypertension May Protect Against Musculoskeletal Complaints

Hypertension may help protect against chronic musculoskeletal complaints possibly by decreasing pain sensitivity. Previous reports have linked hypertension with hypalgesia, but it was unclear if blood pressure was related to the occurrence of chronic musculoskeletal complaints. Compared with normotension, a high systolic and diastolic blood pressure was linked to a 10% to 60% lower prevalence of chronic musculoskeletal complaints. Moreover, the prevalence of chronic musculoskeletal complaints showed a strong inverse relationship with blood pressure.

Source: Arch Intern Med 2005;165:916-922.

Aldosterone Levels Linked to Hypertension

Increased aldosterone levels within the physiologic range are related to risk of developing hypertension. Primary hyperaldosteronism is a cause of secondary hypertension. It is unknown whether serum aldosterone levels within the physiologic range influence the risk of hypertension. In community-based sample, increased aldosterone levels within the physiologic range predisposed persons to the development of hypertension. One potentially important interpretation of these data is that the risk of the development of hypertension in some persons is related to the presence of underlying mild primary hyperaldosteronism. Thus, in these persons, aldosterone may indeed be a villain rather than a bystander in a society in which dietary sodium intake is high.

Source: N Engl J Med. 2004;351:8-10, 33-41

High Folate Intake May Reduce Risk of Hypertension in Women

High folate intake from dietary and supplemental sources significantly decreases the risk of incident hypertension in women, especially younger women. Oral folic acid supplementation improves endothelial function in vivo and two small randomized trials have demonstrated that high-dose folic acid supplementation may lower systolic and diastolic blood pressure. Taken together, these data suggest that a higher intake of folate may reduce an individual's risk of hypertension.

Source: JAMA. 2005;293:320-329

Women With Hypertension Have Sexual Problems Too

Premenopausal women with hypertension, who are otherwise healthy, suffer from sexual problems caused by high blood pressure and its medication is as do men. Researchers found that 67 hypertensive women, regardless of type of medication used, and 37 unmedicated women with high blood pressure, reported a decrease in vaginal lubrication, less frequent orgasm, and more frequent pain when compared with 107 women without high blood pressure. Because erection and early lubrication occur in the arousal phase of sexual activity, lack of lubrication in women may be analogous, at least in part, to erectile dysfunction in men.

Editorial Note

Dear Doctor

We are happy to present the inaugural issue of *"Insight Heart"*. It is a small endeavor from us to provide you compiled & updated information on cardiovascular diseases and its management. This issue is focused on *"Hypertension"*. We will appreciate your thoughtful comments on the Newsletter to enrich the publication.

Thanks and regards.