

HYPERTENSION

Definition -

Hypertension is defined as the persistent high blood pressure. Clinically, when the systolic and diastolic pressure remain elevated. It is considered as hypertension. If there is increase only in systolic pressure, it is called systolic hypertension.

I. Borderline systolic Hypertension —

Diastolic B.P. is normal and systolic B.P. is between 140 and 159 mm/Hg.

II. Isolated systolic Hypertension —

The systolic B.P. is 160 mm/Hg and above and fluctuates from time to time, high in the morning and low at night.

III. Labile Hypertension —

The patient is hypertensive at one time and normotensive at another time.

IV. Malignant Hypertension —

HTN is associated with complication like- Papilledema, retinal exudates, Haemorrhage. (200/140 mm of Hg)

V. Accelerated Hypertension —

Denotes a recent rise in B.P. with retinal damage but without Papilledema.

Classification of blood pressure (W.H.O.)

<u>Category</u>	<u>Systolic</u>	<u>Daistolic</u>
Normal	< 130	< 85
High Normal (Pre hypertension)	130-139	85-90
Hypertension		
Mild	140-159	90-99
Moderate	160-179	100-109
Severe	> 180	> 110
Isolated Systolic HTN	> 140	< 90

Classification of HTN

1. Primary or Essential Hypertension - Primary hypertension is the elevated blood pressure in the absence of any underlying disease. The arterial blood pressure is increased because of increased peripheral resistance, which occur due to some unknown cause. About 95% patient suffering with primary HTN. It is occurred between age 25 and 55 year uncommon before 20-year age.

Causes – Causes are unknown किन्तु कुछ अवस्थायें हैं जिन्हें जिम्मेदार माना जा सकता है –

I. Sympathetic Nervous System Hyperactivity-

In younger person with tachycardia & elevated cardiac output, some emotional condition may aggravate B.P.

II. Abnormal Cardiovascular or renal development-

In low-birth-weight infants in their adulthood. Abnormal development of aortic elasticity or reduced development of the microvascular network.

III. Renin angiotensin system activity

IV. Defect in natriuresis

V. Intracellular sodium & calcium

VI. Other causes – Obesity, alcohol, smoking, NSAIDS, Lack of exercise.

2. Secondary Hypertension- It is due to some underlying disease. About 5% of patient with HTN identifiable specific cause revealed by the history, physical examination, routine laboratory test.

Causes-

(1) Cardiovascular hypertension-

- (a) Atherosclerosis - Hardening of blood vessels due to fat deposition.
- (b) Coarctation of aorta – narrowing of aorta.

(2) Endocrine Disorder -

- a) Pheochromocytoma
- b) Cushing's syndrome
- c) Primary hyper aldosteronism (Conn's syndrome)
- d) Hyper parathyroidism
- e) Acromegaly – (Excess secretion of growth hormone)
- f) Primary hypothyroidism
- g) Thyrotoxicosis

(3) Genetic-

- a) Glucocorticoid remediable aldosteronism
- b) Syndrome of apparent mineralocorticoid excess
- c) Liddle syndrome

(4) Renal disease-

- a) Paranchymatous- Acute & chronic glomerulonephritis pyelonephritis
- b) Polycystic kidneys
- c) Renal artery - stenosis (Renal vascular hypertension)
- d) Amyloidosis
- e) Diabetes

(5) Drugs- O.C.P., Steroid, NSAIDS, Carbenoxolone, Sympathomimetic agent, Cyclosporine, Beta-receptor agonist, estrogen therapy.

(6) Alcohol

(7) Pregnancy-

- a) Due to low glomerular filtration rate and retention of sodium and water.
- b) Autoimmune processes during pregnancy.
- c) Release of some vasoconstrictor agent from placenta.

Clinical classification-

According to the clinical course, both essential and secondary hypertension may be benign or malignant.

(I) Benign HTN-

Benign HTN is moderate elevation of blood pressure and the rise is slow over the years. About 90-95% patient of HTN have benign hypertension.

(II) Malignant HTN-

Malignant HTN is marked and sudden increase of blood pressure to 200/140 mmHg or more in a known case of hypertension or in a previously normotensive individual, the patients develop papilledema, retinal haemorrhages and hypertensive encephalopathy. Life expectancy in these patients is generally less than 2 years if not treated effectively

Magnitude - HTN is global problem. In India it is estimate to range from 4 to 8% and the trend is increasing due to changes in lifestyle.

Mortality - HTN is a major risk factor for stroke, CHD, Heart or kidney failure. The higher the pressure, the greater the risk and lower the expectation of life.

Blood Pressure Measurement - Three sources of errors.

- a. Observer error
- b. Instrumental error
- c. Subject error - Physical environment, position of the patient, fear, anxiety.

B.P. sitting position में ले left या right किसी भी Arm में ले किन्तु एक ही Arm को हमेशा follow करे |

Tracking of blood pressure - Childhood से B.P. measurement का record लिया गया तो जिनका B.P. childhood से बढ़ा हुआ था उनका BP आगे भी बढ़ा हुआ रहता है जबकि जिनका B.P. childhood में low था उनका adulthood में भी low ही रहा | इस तरह का अध्ययन childhood से करने से at risk के patient को Identify किया जा सकता है |

Prevalence - In some industrialized country, up to 25% of adults have diastolic pressure above 90 mmHg. Prevalence in the developing countries seems to be similar to that in European or other developed society ranging from 10% to as much as 20% among adults.

Prevalence in India - The prevalence of HTN was 59.9 and 69.9 per 1000 in males and females respectively in urban population and 35.5 and 35.9 per 1000 in males and females respectively in the rural population.

Risk Factor -

Non modifiable risk factor =

- (1) Age - HTN rises with age in both sexes and the rise is greater in those, who had higher initial B.P.
- (2) Sex—युवावस्था /मध्यावस्था तक पुरुषों में अधिक किन्तु menopause के बाद महिलाओं में अधिक होता है|
- (3) Genetic factor - यदि माता-पिता दोनों Hypertensive है तो 45% संतान में HTN के chance होते हैं |
- (4) Ethnicity - Higher B.P. levels among black people than among whites.

Modifiable risk factor -

- (1) Obesity- Greater the weight gain, Higher the risk factor of acquiring HTN. specially central obesity.
- (2) Salt intake - Sodium chloride के अधिक सेवन से, potassium chloride के सेवन न करने से potassium B.P. को कम करता है |
- (3) Saturated fat- Risk factor for HTN & serum cholesterol.
- (4) Dietary fibre - Consumption of dietary fibre reduced risk of HTN, because it reduces LDL cholesterol.
- (5) Alcohol - इससे systolic pressure ज्यादा बढ़ता है, Diastolic की अपेक्षा |

(6) Heart rate

(7) Physical inactivity

(8) Environmental stress

(9) Socio economic status- सामान्यतः Higher class में पाया जाता है किन्तु Life style changes के कारण lower class में भी पाया जाने लगा है |

(10) Oral contraceptive (oestrogen) - for long use

(11) Diabetes mellitus

(12) Other causes - Noise, vibration, temperature, humidity.

Clinical finding-

(A) Symptoms-

- Headache
- Dizziness (confusion)
- Somnolence (तन्द्रा)
- Visual disturbance
- Nausea & vomiting
- Anxiety
- Palpitation
- Profuse perspiration
- Polyuria
- Nocturia
- Nocturnal dyspnoea
- Epistaxis

(B) Sign-

I. Blood pressure

II. Retina - Copper or silver wire appearance, exudates, haemorrhages or papilledema.

III. Pulse - Radial femoral delay suggests coarctation of aorta, loss of peripheral pulses occurs due to atherosclerosis, less commonly aortic

dissection and rarely Takayasu arteritis, all of which can involve the renal arteries.

(C) Laboratory findings-

- I. Urine - for blood, protein, glucose.
- II. Blood - for urea, electrolytes and creatinine, glucose, Hb.
- III. Renal function test, lipid profile, serum uric acid, aldosterone / rennin.

(D) Imaging finding-

- I. ECG
- II. C-Xray
- III. Echocardiography

Complications:

1. CVS - Left ventricular hypertrophy, congestive heart failure, Myocardial ischemia, sudden death. Atherosclerotic Complications
2. CNS - Cerebro vascular accident, Cerebral haemorrhage, Accelerated atherosclerosis may cause cerebral thrombosis, Embolism and infraction. Cerebral arteriolar spasm may cause hypertensive encephalopathy.
3. Renal disease - Long standing HTN may cause Proteinuria and Progressive renal failure by damaging renal vasculature. Compromised in renal function. Shrinkage of kidney.
4. Aortic dissection (a tear develops in the inner layer of the aorta.)
5. Retina - (Hypertensive retinopathy)

The following changes may occur.

Grade-1 - Anterior thickening, tortuosity and increased refractiveness (silver wiring).

Grade-2 - Grade-1 + Constriction of veins at arterial crossing (arteriovenous nipping).

Grade-3 - Grade-2 + evidence of retinal Ischemia

(Flame shaped or blot haemorrhages and cotton wool exudates)

Grade-4 - Grade-3 + papilledema.

Prevention:

(1) Primary prevention

(a) Population strategy - सामान्य जन को इस तरह से शिक्षित किया जाय कि HTN को

बढ़ाने वाले कारणों से वह दूर हो सके | यथा-

(I) Dietary changes-

- Reduction of salt intake < 5 gm/day
- Moderate fat intake
- Avoidance of high alcohol intake
- Restriction of energy intake appropriate to body needs.

(II) Weight reduction

(III) Exercise promotion

(IV) Behavioural changes – stress, smoking, modification of life style.

(V) Health education

(VI) Self care – B.P. को एक Diary में नोट करे |

(b) High risk strategy – 50 वर्ष के रोगी, मद्यपान करनेवाले, diabetics, sedentary workers, Pregnant mothers, History of HTN. इन लोगों की B.P. को हमेशा चेक करते रहने से इन लोगों का शीघ्र ही निदान संभव है और तुरन्त Anti HTN Treatment देकर complications से रोगी को बचाया जा सकता है।

(2) **Secondary Prevention** - The goal of secondary prevention is to detect and control high blood pressure.

(a) Early case detection

(b) Treatment - In essential HTN, as in diabetes, we cannot treat the cause, the aim of treatment should be to obtain a blood pressure below 140/90 and ideally 120/80. Control of HTN has been shown to reduce the incidence of stroke and other complications.

(c) Patient Compliance – HTN का treatment life long चलता है किन्तु रोगी चिकित्सक के निर्देशों का पालन यदि पूरी तरह से नहीं करता है तो यह एक समस्या है, यदि रोगी चिकित्सक के निर्देशों का पालन करता है, समय पर दवा एवं जीवन शैली में परिवर्तन करता है तो HTN से होने वाले complications को रोका जा सकता है |

Treatment - If B.P. is more than 160/90 और life style modification से 6 माह में

लाभ न होने पर औषधि द्वारा HTN को नियंत्रित करना चाहिए |

- (a) Diuretics
- (b) Beta Blockers - Block the effect of sympathetic nerves on heart and blood vessels by binding with beta adrenoceptors, so that, there is reduction in cardiac output and inhibition of vasoconstriction leading to fall in blood pressure.
- (c) ACE inhibitor - These drugs reduce the blood pressure by blocking the formation of angiotensin.
- (d) Calcium channel blockers - These drugs block the calcium channels in myocardium and thereby, reduce the contractility of myocardium. It causes decrease in cardiac output and falls in blood pressure.
- (e) Alpha blockers - Block the effect of sympathetic nerves on blood vessels by binding with alpha adrenoceptors leading to vasodilation and fall in blood pressure.
- (f) Angiotensin II receptor blockers (Angiotensin II antagonists) - Decrease blood pressure by blocking the effect of angiotensin II (vasoconstriction and secretion of aldosterone)
- (g) Vasodilator - These agents reduce blood pressure by causing vasodilation.
- (h) Depressors of vasomotor centre - These drugs act on vasomotor centre and reduce the vasomotor tone so vasoconstriction is prevented.

Ayurvedic Management of Hypertension:

- 1) Weight loss and exercise
- 2) Smoking cessation
- 3) Diet - Increased fruits and vegetables, low salt, limited alcohol.
- 4) Drugs- If B.P. is more than 160/90 and life style modification are not responding.

(a) Diuretics - गोक्षुर, तृणपंचमूल, भूम्यामलकी, कंकोल, अनानास, चंद्रप्रभावटी, punarnava mandoor|

(b) Beta blockers - मस्तिष्कशामक |

(c) Ace inhibitor - वृक्क पर कार्य कर Angiotensin के secretion को कम करे |

(d) Calcium channel blocker- वातशामक, हृदयशामक |

(e) Alpha blocker- मस्तिष्कशामक |

(f) Angiotensin II antagonists

(g) Vasodilator - भीमसेनी कपूर, कफशामक औषधियां, त्रिकटु, श्रृंग |

* मस्तिष्कशामक — mukta pishti

ashwagandha

शंखपुष्पी - रक्तभार शामक

वचा - रक्तभार शामक

जटामांसी - रक्तभार शामक

सर्पगंधा - रक्तभार शामक

रुद्राक्ष - रक्तभार शामक

मासिकधर्म से HTN - आरोग्यवर्धनी + चन्द्र प्रभावटी

शराब जनित HTN - चंद्रप्रभावटी + शिलाजीत

अन्य योग - सर्पगंधादि गुटिका, अश्व कंचुकी रस, इच्छा भेदी रस, सारिवासव, जवाहरमोहरा पिष्टी

* हृदय शामक-akik pishti

* वात शामक - दशमूल क्वाथ

मल शोधक - त्रिफला चूर्ण, अविपत्तिकर चूर्ण, ईच्छा भेदी रस, अश्व कंचुकी रस ।

* योग — आसन- हलासन, जानु शीर्षासन, पश्चिमोत्तानासन, वीरासन, सिद्धासन, पद्मासन, शवासन,

प्राणायाम - बिना कुम्भक के नाड़ी शोधन प्राणायाम, उज्जायी प्राणायाम