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RESEARCH ARTICLE

ESSENTIAL HYPERTENSION: WHAT AYURVEDA CAN OFFER.

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Abstract

Hypertension (HTN) exerts a substantial public health burden on cardiovascular health status and healthcare systems in India. HTN is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India. Among the patients taking allopathic treatment, only about 25.6% of treated patients had their BP under control. This demands a treatment protocol which can give safer and effective results. Ayurveda in the form of Panchakarma, herbal and herbo-mineral drugs can offer a helping hand.

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Introduction:-

Human life has been considered as a valuable opportunity to achieve the prime goal of life viz. Dharma, Artha, Kama & Moksha^[1]. To achieve this, one needs a Healthy and Calm life. But in the race of money and so called development, man has left his prime goal behind. Therefore today's Metaphysical Society is facing unsteady, weakened, hard & everyday changing lifestyle. The Stressful and hurried life style of today affects one's mind and homeostasis of body by several psychosomatic mechanisms causing many psychosomatic disorders and essential hypertension is one of those diseases. Hypertension is sustained high blood pressure; sometimes also called arterial hypertension, is a chronic medical condition in which the blood pressure in arteries is elevated^[2]. When the cause is not known, it is called idiopathic or essential hypertension^[3]. It is also called as a silent or hidden killer because most of the sufferers (85%) are asymptomatic^[2]. This feature of hypertension is responsible for a huge number of cases remaining undiagnosed. Recent studies from India have shown the prevalence of HTN to be 25% in urban and 10% in rural people in India^{[4]-[6]}.

In Ayurveda classics, there is no direct correlation mentioned for hypertension. But it is said in Ayurveda texts- "In case of an unknown disease, the physician should try to understand the nature of the disease through dosha, the site of manifestation, etiological factors and then should initiate the treatment"^[7].

Material and methods:-

The pathogenesis of hypertension takes place at both physical and psychic level one at a time or simultaneously depending upon the Dosha-Dushya Sammurchhana. Agnidushti results in Ama formation and subsequent Dhatudushti (Rasa and Rakta). This leads to Kha-Vaigunya i.e. obstructive pathology in channels. The Ama production results into Strotorodha (obstruction) and thus partially blocks the normal Rasa- Rakta circulation which

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further vitiates Vyana Vayu. This obstructed Vyana Vayu leads to forcible blood flow in the blood vessels causing increased resistance, hereby increasing blood pressure^[8].

Ayurveda has three principles of management for any disease namely:

1. Nidana Parivarjana
2. Shodhana
3. Shamana

Nidan parivarjan^[9]–

It means avoiding the causative and risk factors. In case of essential hypertension patient should follow the following pathya and apathya.

1) PATHYA(DO'S)	2) APATHYA(DONT'S)
VIHAR- <ul style="list-style-type: none"> Regular blood pressure check-up Lifestyle modifications like timely intake of balanced diet, regular physical exercise, daily brisk walking for half an hour Weight reduction Timely sleeping and awakening. Regular practice of Yoga, Meditation etc. under the supervision of Yoga expert 	VIHAR- <ul style="list-style-type: none"> Practice of day sleeping and awakening at night.
AAHAR- <ul style="list-style-type: none"> More use of fruits and green vegetables Reduce intake of oily, salty, sour and spicy food items More use of Barley (Yava), Sorghum (Jowar), wheat, green gram (Mudga/Moong dal), horse gram, moringa (Shigru), Bitter gourd (karela), Bottle gourd (Ghia/ Lauki), Turnip (Shalgam), Carrot (Gajar), Radish (Muli), Indian gooseberry (Amla), Cucumber (Khira), Black grapes (Draksha), Pomegranate (Anar), Apple, Pineapple, Cold milk etc 	AAHAR- <ul style="list-style-type: none"> Excessive intake of salt (sprinkling over salad, curd etc.) Excessive use of Butter, Ghee, Chillies (Red-Green), Pickles, Til taila, Bengal gram, Mustard oil, Sour fruits, Curd, Tea, Coffee etc. Intake of animal fat, processed/oily food items. Alcohol consumption and smoking.

Shodhana

Shodhana means purification of the body by eliminating morbid doshas and dushyas from body through panchakarma hence breaking the samprapti of disease. Through various researches done on essential hypertension, following shodhana therapies can be done:

1. Virechan
2. Basti- ksheer basti, lekhan basti, etc
3. Nasya
4. Shirodhara- takradhara, jaladhara, tailadhara, etc
5. Raktamokshan- siravedh etc

Shaman –

The principle of shaman therapy is to normalize and maintain the equilibrium of all the doshas. The following drugs (single/compound formulation) are commonly used for prevention and control of Hypertension (to be taken under Ayurvedic medical supervision):

Single drugs-

Amalaki, Jyotishmati, Chhangal Jadi, Rudraksha, Haridra, Japapushpam , Jatamamsi, Punarnava, Bhringraj, Sadabahar, Sarpagandha, Shankhapushpi, Shigru, Tagar, Vacha^[10].

Compound drugs-

Arjun Ksheerpaka, Brahma Rasayan, Chandralekha Rasam, Chyavana Prasha, Guduchi Rasayanam, Jatamamsi Kwath, Jatamamsyadi Yoga, Madhuparnyadi Yogam, Mahavat Vidhwansak Rasa, Mangalyakusuma Mansyadi Yoga, Medhya Rasayanam, Medhya Vati, Nirvishi Sindoor Kalpa, Prasadi Vati, Prasadini Vati, Rasagandhati Vati, Rasa Sindoor, Sarpagandha Ghan Vati, Shodashang Kashaya, Vacha-Mansyadi Yoga^[10].

Non pharmacological measures-

Pranayam, yoga therapy, shavasan

On the basis of form of medicine:

1. Kashayam (Decoction) - Jatamansi Hima, Dashmool Kwath, Arjun Kwath, Punarnava Kwath, Mahamanjistha Kwatha
2. Choorna (Powder) - Choorna Of Sarpagandha, Arjuna And Gokshura, Ashawagandha Choorna, Tagar
3. Bhasma (Rasa preparation) - Mukta Pisti, Jaharmohra Pisti, Mukta Shukti.
4. Vati (Tablet) - Sarpagandha Ghana Vati, Brahmi Vati^[2].

Here is the list of plants that have antihypertensive properties^[11]:

Drug	Botanical name and family	Part Used	Chemical Constituents
Sarpagandha	Rauvolfia serpentine; Apocynaceae	Root	Ajmaline, Rescinnamine, Serpentinine, Sarpagine, Deserpidine, And Chandrine
Lashun	Alium sativum; Liliaceae	Bulbils	Sulfur Containing Compounds Alliin, Ajoene, Diallylsulfide, Dithiin, Sallylcysteine
Aadrak	Gingiber officinalis; Zingiberaceae	Rhizomes	Volatile Oil ; 3sesquiterpines:- Bisaboline, Zingiberene And Zingiberol
Jalbrahmi	Centella asiatica; Aplaceae	Whole Plant	Pentacyclic Triterpenes Derivativesmadecassosides And Asiaticosides.
Arjun	Termenalia arjuna; Combretaceae	Bark	Tannins, Triterpenoid Saponins, Flavonoids, Gallic Acid, Ellagic Acid, Opcs, Phytosterols, Calcium, Magnesium, Zinc, And Coppe
Black cumin seed	Nigella sativa; Ranunculaceae	Seed	Thymoquinone, Dithymoquinone, Thymohydroquinone, Thymol, Carvacrol, Tanethole And 4-Terpineol. H
Ashwagandha	Withania somnifera; Solanaceae.	Whole Plant	Alkaloids Including Withanine, Withananine, Withananine, Pseudowithanine, Somnine, Somniferine, Somniferinine. The Leaves Of Indian Chemotype Contain Withanolides, Including Withaferin
Bhringraj	Eclipta prostrata /Eclipta alba ; Asteraceae	Leaves	Wedelolactone And Dimethyl Wedelolactone, Ascorbic Acid. Alkaloid, Ecliptine. Thiophene Derivatives Mono-, Di- And Trithiophene Acetylenes Together With A-Terthenyl In β -Sitosterol. The Roots Are Very Rich In Thiophene Acetylenes. Active Constituent, Culumbin, Exhibited Remarkable Antihypertensive Activity
Punarnava	Boerhavia diffusa; Nyctaginaceae	Whole Plant	Punarnava Contains B-Sitosterol, A-2-Sitosterol, Palmitic Acid, Ester Of Bsitosterol, Tetracosanoic, Hexacosonoic, Stearic, Arachidic Acid, Urosilic Acid,

			Hentriacontane, Becdyson, Triaccontanol. Punarnavoside (Antifibrinolytic Glycoside, 0.03-0.05%); Oeravinones, Lignans (Liriodendrin, Boeravine & Hypoxanthine Deriv .) ; Flavones, Sterols; Root Contains Alanine, Arachidic Acid, Aspartic Acid, Behenic Acid, Boerhavic Acid, Boerhavone, Pot.Nitrate (6.5 %), Oxalic Acid, Punarnavine 1 And 2 Etc.
Shatavari	Asperagus recemosus; Asparagaceae	Tuberous Dried Root	Saponins—Shatavarins I–IV. Shatavarin IV Is A Glycoside Of Sarsapogenin. Dried Root Yields Sitosterol; (Dihydroxy-O Hydroxyisobutyl) Benzaldehyde And Undecanyl Cetanoate, And Contains A Large Amount Of Saccharine Matter, Mucilage And Minerals
Changal jadi	Coleus forskohlii; Lamiaceae.	Root	Ditermene Coleonol,
Ambashthaki	Hibiscus sabdariffa; Malvaceae	Calyxes	Oxalic,Malic,Citric,Tarteric Andhibiscic Acid
Draksha	Vitis vinifera; vitaceae	Seed Extract	Grape Skin Produces Endothelium Dependent Aorta Relaxation Possibly By Its Flovonoids (Quercetin)
Olive leaf	Olea africana and Olea europea; Oleaceae	Leaf	Oleuropein, A Complex Structure Of Flavonoids, Esters, And Multiple Iridoid Glycosides, ”””
Lotus	Nelumbo nucifera; Nelumbonaceae	Arial Parts	Alkaloids Including Liensinine, Isoliensinine, Referine, Lotusine, Methylcorypalline, And Demethylcoclaurine. Among Them, Referine Has Been Shown To Have A Vasodilating Effect And Liensinine Has Antihypertensive And Antiarrhythmic Abilities

Discussion:-

Probable mode of action of panchkarma-Basti ^[12] _

BP is regulated by the feedback of the neural tissue of Vaso-Motor Center (VMC). VMC activity in turn depends upon reflexes from periphery (neural and chemical) and from higher center. Sympathetic stimulation causes activation of pressure area of VMC, which in turn causes vasoconstriction and leads to rise in BP, while parasympathetic stimulation causes activation of depressor area of VMC, which in turn results in vasodilatation and precipitates decrease in BP. The long-term regulation of BP occurs through Renin-Angiotensin-Aldosterone (RAA) axis of endocrine mechanisms. Lower part of GIT is richly supplied with parasympathetic nerves which on stimulation with Basti (either by chemical or mechanical receptor) may cause decrease in secretion of RAA complex, and by activating depressor area of VMC which causes vasodilatation and results in decrease in BP. Enteric Nervous System (ENS) works in synergism with the CNS on stimulation with Basti (either by chemo or mechano receptors) and may lead to activation of depressor area of VMC, which finally causes decrease in BP. It is not mandatory for a drug to remain in contact with the receptor for long time e.g. in proton pump inhibitor mechanism, the drug interacts with receptor and gets flushed out from circulation, it is known as “hit and run module” of kinetics. The same module of kinetics can be hypothesized for Niruha Basti.

Virechan ^[13] _

Virechana process can remove excess of sodium ions and excrete potassium through G.I.T. Watery stool cause depletion of bicarbonate. Virechana can eliminate bicarbonate. It can maintain Acid-Base balance too. By the process of Virechana, we may say that Virechana may give effect on Angiotensin-II enzyme, which helps to reduce

retention of salt and water, which decrease extra-cellular fluid from the body, which ultimately decreased blood pressure.

Shirodhara ^[13] _

Local application as Ointment may pass through the Stratum corneum into blood vessel and producing desirable effects by reaching the target organ. The continuous pouring of Liquid in relaxed and comfortable position has an additional effect which can be compared to cradling of Mother to a child. This function act as a Sedative and Soothing effect for the Brain and produces Sleep. Materials used for Shirodhara is always warm which causes vasodilatation of all the channels and thereby improving their circulation which in turn improves the blood circulation of Brain. This improves the higher intellectual functions also. So an improvement in psychic symptoms is achieved. Improvement in circulation to hypothalamus also improves the function of Autonomic Nervous System as its stimulation during stress causes many physiological disturbances. Shirodhara may also have Alpha Adrenergic blocking effect and can thus block certain actions of adrenaline and nor adrenaline. Shirodhara may also act on the adrenergic neuron probably produce their effects by modifying the synthesis storage and uptake mechanisms of noradrenaline. Regulation of emotional and behavioral patterns: Together with the limbic system with the hypothalamus regulates the feeling of rage, aggression, pain and pleasure and behavioral patterns of sexual arousal Ultimately it can be postulated that Shirodhara may be having some effect on hypothalamus resulting in decrease of most of the psychic and somatic disorders. By affecting in all these ways, Shirodhara gives results in EHT.

Mode of Action of Shaman Drugs ^[11]

1. Centrally acting- withania (CNS acting), rauwolfia (catcholaminedepeleters), hypericum (dopamine and norepinephrine re-uptake inhibitors), black cumin seed (CNS acting and antioxidant)
2. Vasodilators- Garlic (Via Hyperpolarization through H₂S), Ginseng (Direct Smooth Muscle Relaxant), Hawthorn, Vitis, Yarrow, Olive Leaf (Endothelium Dependent Vasodilation), Forskolin (AdenylCyclase Pathway), Lotus
3. Diuretic – punarnava, kalaaja
4. ACE inhibitors- Garlic (by allicin), vacha, bibhitaki, pippali
5. Calcium channel antagonist- shunthi , brahmi
6. Cholesterol Synthesis Inhibitors- Cat's claw, African mistletoe
7. Hypolipidemic- matulunga, amlavetas, vrikshamla, pushkarmool

Conclusion:-

Essential hypertension is a deadly disease leading to many cardiovascular, cerebral and renal events. Treatment of this disease is still very challenging and complicated. Ayurveda can offer better treatment modalities. Following good dietary code and conducts and lifestyle modification along with panchakarma shodhan therapies and shaman medicines, nation can cope up with this disease. The ideal prescription for this disease should be “lifestyle prescription”.

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