Arjunadi Anubhoot Yog in Hypertension: A Review Study

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ABSTRACT

One of key risk factor for cardiovascular disease is hypertension or raised blood pressure is major risk for cardiovascular disease and ischemia’s as well as hemorrhagic stroke, heart attack. WHO had published “A Global Brief on Hypertension—Silent killer, a public health crisis” on world health day 2013. According to WHO hypertension defined as, systolic blood pressure equal to/above 140mmhg and /diastolic blood pressure equal to /above 90mmhg. Ayurvedic texts provide no straight reference about essential hypertension, but disease can be explained on base of Ayurvedic principles. Though many Ayurvedic medicines were used for management of Hypertension, a holistic formulation containing ingredients that can address all possible pathways of Hypertension was not available. Therefore, new formulation containing Arjuna (Terminalia arjuna), Shankhapushpi (Convolvulas pluricaulis), Ashwagandha (Withania somnifera), Punarnava (Boerhaavia diffusa), Jatamansi (Nordostachys jatamansi) had been formulated to assess its efficacy.

Keywords: Ayurveda, Hypertension, Arjuna, Punarnava, Jatamansi

INTRODUCTION

Ayurveda is ancient science of medicine in world whose origin in Vedic era. The aim of Ayurveda is “to maintain the health in the healthy person and to alleviate the disorders in the diseased”. [¹] Until 1940, majority of cardiovascular diseases were treated with traditional drugs obtained from plants but with time entry of conventional modern medicine has overshadowed the phytochemical products. In fact the incidence of hypertension is still rising alarmingly; there is dire need to search for an effective and safe magical remedy because of lack of current therapies to either provide complete cure or treating patient at a cost of adverse effects. For preservation of the vital organs, the use of medicinal plant is the need of an hour. Antihypertensive drugs in modern medicine are not effective owing to dependence side effects and cost. Though practically adopted, there is very little scientific and systemic data available for the role and efficacy of Ayurvedic medicines in hypertension.

Ayurvedic texts provide no straight reference about essential hypertension, but disease can be explained on base of Ayurvedic principles. There are different opinion regarding Ayurvedic nomenclature for hypertension such as Raktagata Vata, Dhamani prapurnata, Siragata vata, Dhamani Pratichaya, Vaishamya Avrut Vata, Raktavata, Vyanabala vaisamsya etc. Acharya Charak has advised to treat such a disease without nomenclature by judging the involvement of Doshadushya only. Essential hypertension has been screened as Vata Pitta Pradhana Raktaprdoshaja Vikara. According to Ayurvedic principles main treatment of Pitta is Virechna. Pitta is Mala of Rakta. Therefore; Rakta can be pacified by Virechana treatment.

Though many Ayurvedic medicines are used for management of Hypertension, a holistic formulation containing ingredients that can address all possible pathways of Hypertension is not available in market. Therefore, new formulation containing
**Arjuna** (Terminalia arjuna), **Shankhapushpi** (**Convolvulus pluricaulis**), **Ashwagandha** (**Withania somnifera**), **Punarnava** (**Boerhaavia diffusa**), **Jatamansi** (**Nordostachys jatamansi**) has been formulated to assess its efficacy in above lines. All these ingredients are mentioned in Ayurvedic literature as an individual herb and also as ingredients of various formulations. Each of these herbs has been reported to be safe by toxicity study. Acute oral toxicity of above mention drug formulation had been carried out in rats. [2]

<table>
<thead>
<tr>
<th>Name of drug</th>
<th>Latin name</th>
<th>Family</th>
<th>Part used</th>
<th>Amount (Matra)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arjuna</td>
<td>Terminalia arjuna Roxb.</td>
<td>Combretaceae</td>
<td>Trika</td>
<td>1part</td>
</tr>
<tr>
<td>Shankhapushpi</td>
<td>Convolvulus pluricaulis Chois.</td>
<td>Convolvulaceae</td>
<td>Panchanga</td>
<td>1part</td>
</tr>
<tr>
<td>Punarnava</td>
<td>Boerhaavia diffusa Linn.</td>
<td>Nycteginaeaceae</td>
<td>Panchanga</td>
<td>1part</td>
</tr>
<tr>
<td>Jatamansi</td>
<td>Nordostachys jatamansi DC</td>
<td>Valerianaceae</td>
<td>Moola</td>
<td>1part</td>
</tr>
<tr>
<td>Ashwagandha</td>
<td>Withania somnifera Linn</td>
<td>Solanaceae</td>
<td>Moola</td>
<td>1part</td>
</tr>
</tbody>
</table>

**Recent researches of ingredients:**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Action</th>
<th>Research work</th>
<th>Investigator/Author</th>
<th>Journal</th>
<th>Year of Publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arjuna</td>
<td>Hypotensive</td>
<td>Salutary effect of Terminalia Arjuna in patients with severe refractory heart failure</td>
<td>Bharani A, Ganguly A, Bhargava KD</td>
<td>Int J Cardiol</td>
<td>1995</td>
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<td></td>
<td></td>
<td>Beneficial effects of terminalia arjuna in coronary artery disease</td>
<td>Dwivedi S, Jainari R</td>
<td>Indian Heart J</td>
<td>1997</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cardiotonic</td>
<td>Manik SK, Katwar CK</td>
<td>Curr Pharm Biotechol</td>
<td>2010</td>
</tr>
<tr>
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<td></td>
<td>Herbal Treatment for Cardiovascular Disease the Evidence Based Therapy</td>
<td>Zafar Alam Mahmood, Mohammad</td>
<td>Pak Journal of Pharma</td>
<td>2010</td>
</tr>
<tr>
<td>Jatamansi</td>
<td>Antidepressant</td>
<td>Comparative study of antidepressant activity of methanolic extract of Nordostachys jatamansi DC Rhizome on normal and sleep deprived mice</td>
<td>Rahaman, H.Murlidhar an, P</td>
<td>International Journal of Med.Arom.Plants</td>
<td>2010</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A review article on phytochemistry and pharmacological profiles of Nardostachys jatamansi DC medicinal herb</td>
<td>Parmia, Meemakshi Bhatt and Preeti Kothiyal</td>
<td>Journal of Pharmacognosy and Phytochemistry</td>
<td>2015</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Antihypertension</td>
<td>Effect of Nordostachys jatamansi extract on vascular endothelial dysfunction in hypertensive, hyperglycemic patients: An open-label, prospective study</td>
<td>Rajyalakshmi et al.</td>
<td>Journal of Pharmacy Research</td>
</tr>
</tbody>
</table>
Antihypertension | Nardostachys jatamansi is a very effective, potential and safe drug for the management of patients with essential hypertension along with dietary restrictions and modified lifestyle [25]. Velpandian V et al. | International Journal of Pharmaceutical and Phytopharmacological Research | 2012

Cardiotonic | Rhizome shows efficacy against mitochondrial and lysosomal damage induced by doxorubicin in rats. The cardioprotective efficacy of N. jatamansi could be mediated possibly through its antioxidant effect as well as by the attenuation of the oxidative stress. Rajakanni S. et al. | Journal of Health Science | 2007

Anxiolytic | The principal constituents of Nardostachys Jatamansi are volatile essential oil contain Jatamansone, Sesquiterpenoid [0.0 2.0 1%], Spriojatamol, patchouli alcohol, Jatamol A and B, Jatamassic acid, nardostachione and other constituents are resin, sugar, starch, bitter extractive matter and gum. V.M. Jhavat et al. | Journal of pharmacy and research. | 2009

Shankhapushpi | Anti hypertensive | Traditional Indian Herbs Convolvulus pluricaulis and Its Medicinal Importance | Debpriy Bhowmik, K.P. Sampath Kumar. | Journal of Pharmacognosy and Phytochemistry | 2012


Antidepressant | Evaluation of the anti depressant like activity of convolvulus pluricaulis choisy in the mouse forced swim and tail suspension tests. | Dinesh Dhingra et al. | Med sci monit. | 2007


Antihypertensive | In vitro screening of Traditional Medicines for Anti-hypertensive effect Based on Inhibition of the Angiotensin Converting Enzyme (ACE) | Hensen, K. et al. | J Ethno pharmacol | 1995


<table>
<thead>
<tr>
<th>Name of the ingredient</th>
<th>Safety Data</th>
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</thead>
</table>
| _Arjuna_ (Terminalia arjuna Roeh.) | Terminalia arjuna bark shows that is extract of this drug safe upto 2000mg/kg.[9]
| _Shankhapushpi_ (Convolvulus pluricaulis Choisy.) | The aqueous extract of this drug was safe upto 2000mg/kg.[10]
| _Jatamansi_ (Nardostachys jatamansi DC.) | LD50 of the aqueous extract was found to be greater than 5000mg/kg/body wt. After oral administration. (AS rasheed at al). [11]
| _Ashwagandha_ (Withania somnifera Linn.) | Acute toxicity study of extract from the roots of W. Somnifera, was found safe up to 1750mg (P.O.) in Albino mice. [12]
| _Panarnava_ (Boerhavia diffusa Linn.) | 50% aqueous extract of the whole plant did not show any sign of toxicity upto oral dose of 2gm/kg innace. [13]

**DISCUSSION**

**Mode of Action**

_Arjuna_ has _Kasha rasa, Sheeta Virya_ which act as Pittashamaka. _Ruksh Laghu_ guna Katu _Vipaka_ help to alleviate _Kapha_. Due to its _Hridaya-Pushhtikara Prabhava_, it is used in the management of several cardiac disorders. Antioxidant, Hypotensive, antiatherogenic properties of _Arjuna_ plant has been reported in various researches. _T. arjuna_ is widely used for treatment of cardiovascular diseases, including heart diseases and related chest pain, high blood pressure and high cholesterol. The alkaloids in _Ashwagandha_ have a prolonged hypotensive, bradycardic, and respiratory-stimulant action. The hypotensive effect was mainly due to autonomic ganglion blocking action and that a depressant action on the higher cerebral centers also contributed to the hypotension. _Ashwagandha_ is effective _Vata-Kapha shamaka_ drug due to _deepana_ and _anulomana_ property it clears _strotorodha_, improve _Agni_. It is _Balya, Rasayana, Shothanashaka, Medhya rasayana Nidrajanan_ and _Vatanulomaka_ properties which are supportive for treatment of _EHT_.

_Jatamansi_ having property of _Tridoshshamaka_ due to _Tikta, Kashaya, Madhura Rasa_ pacifies _Pitta dosha_,

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whereas **Katu vipaka** and **Laghu guna** pacifies **Vata** and **Kapha dosha** by removing **Strotorodha**. **Madhura rasa** has **Shada-Indriya Prasadana** therefore works as **Manaprasadana karma**. Due to its **Manasadoshahara prabhava** it is **Medhya**, **Hridya-Balya**, **Akshepashamak** which helps in pacifying **dushti** of **Manovaha Srotas**. Having **Raktadoshghara**, **Hridaya balya**, **Medhya**, **Nidrajanan** property. **Manovaha Srotas** is main culprit in **samprapti** of **Essential Hypertension**. So by pacifying **dushti** of **Manovaha strotas** it helped in **Samprapti Vighatana** of EHT. Hypotensive, cardioprotective, anxiolytic properties of **Jatamansi** have been reported in various researches. It is also useful in the management of insomnia and CNS disorders.

**Due to Tikta, Kashaya Rasa, Snigdha, Picchila guna, Madhura vipaka and Sheeta virya, Shankhapushpi acts as Vata-Pitta shamaka. It is effective Medhya Rasayan drug.** Due to its **Manasadoshahrut** property it alleviates **Manasa dosha**. **Shankhapushpi** control the production of body’s stress hormones like adrenaline and cortisol in our body and helps in reducing anxiety and stress. Convolvulus pluricaulis works as rejuvenation therapy and works as tranquilizer and psychostimulant. It is also useful in hypertension. **Punarnava** pacifies all the vitiated **Doshas** in the body. **Rakta Punarnava** has **Shleshma-Pitta-Rakta Vinashini** property. It also possesses **Anulomana, Mutrala, Lekhana, Sothahara**, and **Hridya** properties. By **Mutrala and Sothahara** property, it reduces blood pressure leading to decreased load of heart. **Punarnava** may reduce the blood volume resulting into decreased blood pressure due to their **Mutral** property. **Kleda** formed in the body through several metabolic activities is also expelled out through **Mutral** property, thereby removing toxins in the body. Cardioprotective, Diuretic, Ca+ channel blocker, Cardiac stimulant, Hepatoprotective, Vasodilator, Hypotensive, Anti stress properties of **Punarnava** has been reported.

**CONCLUSION**

The world is looking towards natural remedies system like **Ayurveda**, even though there are various antihypertensive drugs in contemporary system of medicine. Where the scope is almost fully lies on **Ayurveda** concepts, because of it focuses on preventive measures. So it is time to adopt proper screening model of antihypertensive and search for best solution from herbs for HTN. Hypertension screed as **tridoshaja vikara** with **Vata- Pitta** dominance. Circulating **Rakta dhatu** is main **dushya** and **strotas Raktavaha, Rasavaha** together with **Manovaha** are involved. Drug combination possessing **Hridya, Rasayan, Medhya, Mansadoshahara, shleshmashoshak, Raktadoshghara, Nidrajanan, Mutral** properties help to samprapti vighatana of hypertension. It can be given for longer duration without any hazards to body and prevent complications of advance stage of disease. By studying pharmacodynamics which given in Ayurveda another drug combination can be formulated.

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