EFFECTIVE MANAGEMENT OF *KURUDHIAZHAL NOI* (SYSTEMIC HYPERTENSION) WITH *JUSTICIA ADHATODA* LEAVES DECOCTION-A CASE SERIES

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Abstract

Background: Hypertension is one of the foremost lifestyle disorder nowadays, which if untreated leads to many fatal conditions such as stroke, heart attack etc., The Siddha system of medicine is one of the oldest traditional systems of medicine practiced by our Siddhars in Southern India to lead a healthy life. It contains many effective medicines which are useful for both preventive and therapeutic purposes. In Siddha system, systemic hypertension is indicated as Kurudhiazhal Noi. The aim of the present study was to explore the effective management of kurudhiazhal noi (Systemic hypertension) with *J. adhatoda* (Adhatodai) leaves decoction.

Objective: The purpose of the case series is to evaluate the effective management of *Kurudhiazhal noi* (Systemic Hypertension) with *Justicia adhatoda* leaves decoction in newly diagnosed hypertensive cases.

Materials and Methods: It was a case series type of study, conducted at Outpatient Department, Arignar Anna Hospital of Indian medicine, Arumbakkam, Chennai-106. Duration of the study was 7 days and sample size of 6 patients. The newly diagnosed patients with Stage I Hypertension (130-139/80-89 mmHg as per AHAACC guidelines) were selected for the study.

Intervention: *J. adhatoda* leaves decoction were given for the patients diagnosed with Stage I Hypertension for about 3 days. Blood pressure was monitored before and after intervention. The significant reduction in blood pressure was noticed after intervention with the decoction. This ensured that *J. adhatoda* leaves decoction can be used for effective management of *Kuruthiazhal noi* (Systemic Hypertension).

Conclusion: The current study concluded that *J. adhatoda* leaves decoction was effective in treatment and management of Stage I hypertension and has a promising effect on anti-hypertensive activity.

Keyword: Siddha system, *J. adhatoda* leaves decoction, Management, *Kuruthiazhal Noi* (Hypertension), Case series.

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1.INTRODUCTION

The Traditional Siddha Medical System, established by Tamil yogis (Siddhar) classifies the diseases into 4448 types and also describes their specific treatment and modalities [1]. One among that classification was kuruthiazhal noi (Systemic hypertension). As per Siddha system of medicine, "Hypertension is a common disorder rising in incidence and once it established, treatment is obligatory. The hypertension is called as '*Rattha pitham*' or *'kurudhiazhal'* in Tamil Siddha Literatures. Name of the disease is separated in three words like *Kurudhi+Azhal+Noi*, in which *kurudhi* means blood, *azhal* (Pitham) means fire or heat and noi means disease. This meaning denotes that blood function gets imbalanced due to increased heat. The word Kuruthiazhal is coined due to the reason that high blood pressure is caused by increased pitham". [2]

Hypertension is defined as high Blood Pressure in a long-term medical condition in which the blood pressure in the arteries is persistently raised [3]. The chronic elevation of blood pressure systolic >140mmHg and diastolic >90mmHg is defined as hypertension [4]. It has been named the "Silent killer", as it is asymptomatic and the major contributor or risk factor to cardiovascular morbidity and mortality [5]. In 2000, 26.4% of the world's population suffered hypertension and it is predicted that this rate would increase by 60% in 2025 [6]. Hypertension is responsible for around 16.5% of annual deaths worldwide (WHO 2013), and indeed the main cause of morbidity and mortality associated with cardiovascular diseases [7].

Hypertension prevalence studies from mid-1990s to present in urban and rural population show an increasing trend, with a greater increase in urban (33.8%) than rural (27.6%) populations [8,9]. In developed countries, hypertension is the more common in rural populations than in urban [10]. Meta analysis of Indian prevalence studies shown that there has been a significant increase in hypertension in both urban and rural areas. [11]

Essential hypertension is the most prevalent type of hypertension affecting 90 to 95% of hypertensive patients [12]. However, the cause is unknown but also due to many factors such as sedentary lifestyle, stress, visceral obesity, potassium deficiency (hypokalemia) [13], obesity [14], salt (sodium) sensitivity [15], alcohol intake [16] and deficiency of vitamin D [17].

Secondary hypertension by definition results from an identifiable cause. This type is important to recognize since it is treated differently than essential hypertension, by treating the underlying cause of Blood Pressure. Hypertension results compromise or imbalance of the pathophysiological mechanisms, such as the hormone-regulating endocrine system, that regulate blood plasma volume and heart function. [18]

Conventional antihypertensives are usually associated with many side effects. About 75 to 80% of the world population use herbal medicines, mainly in developing countries, for primary healthcare because of their better acceptability with human body and less lesser side effects. In the last three decades, a lot of concerned efforts have been channeled into researching the local plants with hypotensive and antihypertensive therapeutic values. [18]

In Siddha system of medicine, there are many effective herbal, mineral and Herbo-mineral formulations were used for the treatment and management of *Kurudhiazhal noi* (Systemic hypertension). One such unique medicinal plant indicated in "Siddha Materia Medica Part-I" is *J. adhatoda* leaves for an effective management and treatment of *Kurudhiazhal noi* [19]. It was given in the form of leaves decoction. The main aim of the present study is to explore the therapeutic value of *J. adhatoda* leaves decoction in effective management and treatment of *Kuruthiazhal noi* (Systemic hypertension).

2.MATERIALS AND METHODS

2.1 Study design and sample recruitment

The study was designed as a case series, conducted at Outpatient Department, Arignar Anna Hospital of Indian medicine and Homoeopathy, Arumbakkam, Chennai-106. The patients involved in the study were selected based on simple random sampling method. The sample size was about 6 patients between 18-60 years of age with newly diagnosed cases of hypertension. Duration of the study was about 3-7 days.

2.2 Informed consent:

The study subjects who were involved were completely informed about the study in local language, that was understandable to them and freedom of questioning about the study was given to study subjects. After explaining about the study, Informed consent was obtained from the study subjects in an appropriate form.

2.3 Study Methodology:
The patients with newly diagnosed blood pressure of about 130-139 mmHg / 80-89 mmHg (Stage 1 hypertension as per AHAACC guidelines) [20], were taken as study subjects. They were informed to take *J. adhatoda* leaf decoction along with honey under the guidance of investigator for about 3 days as two times a day after food and completely monitored. And the next day their blood pressure was measured using sphygmomanometer and stethoscope.

2.4 Case Description:
Case 1:
A case of 35 years female came with symptoms of mild giddiness, tiredness, head ache without any history of Hypertension, Diabetes mellitus, Bronchial asthma, ischemic heart disease. Followed by the symptoms, blood pressure was monitored using Sphygmomanometer and stethoscope and noticed Systolic as 146mmHg and diastolic as 96 mmHg. The patient was advised to take *J. adhatoda* (Adhatodai) leaves decoction 30 ml with 1ml honey mixed in it, for about 3 days (Two times a day after meal- Morning and night)). The patient was prescribed to follow some lifestyle changes such as walking, yoga and restriction in oil food and salt intake. The patient was monitored for 3 days.

Case 2:
A case of 28 years female came with symptoms of head ache, palpitations without any history of Hypertension, Diabetes mellitus, Bronchial asthma, Poly cystic ovarian syndrome. Followed by the symptoms the blood pressure was monitored using Sphygmomanometer and stethoscope with systolic pressure of 140 mmHg and diastolic pressure of 110mmHg. The patient was advised to take *J. adhatoda* leaves decoction 30 ml with 1 ml of honey mixed in it for continuous three days (Two time per day after meals- morning and night), and advised to follow some yoga practices such as pranayama and physical activities. The patient was monitored for 3 days.

Case 3:
A case of 46 years male came with symptoms of pain in back of the head region with giddiness without any history of hypertension, diabetes mellitus, ischemic heart disease and bronchial asthma and no trauma history. The blood pressure was monitored using sphygmomanometer and stethoscope. The systolic pressure was noticed about 140 mmHg and diastolic was noticed about 90 mmHg. The patient was advised to take *J. adhatoda* leaves decoction 30 ml with 1 ml of honey mixed in it for about 3 days (Morning and night after meals). And prescribed to follow some physical activity such as walking and restriction in salt. The patient was monitored for 3 days.

Case 4:
A case of 32 years female came with the symptoms of giddiness, mild palpitation, tiredness without any history of hypertension, diabetes mellitus, ischemic heart disease and bronchial asthma. The blood pressure was monitored using sphygmomanometer and stethoscope. The systolic pressure was noticed as 130 mmHg and diastolic pressure was noticed as 90 mmHg. The patient was advised to take *J. adhatoda* leaves decoction 30 ml with 1 ml of honey mixed in it for about 3 days (Morning and night after meals). And prescribed to follow some physical activity such as walking and diet restriction in salt intake. The patient was followed for 3 days.

Case 5:
A case of 40 years male came with the symptoms of giddiness, head ache, tiredness without any history of hypertension, diabetes mellitus, ischemic heart disease and bronchial asthma. The blood pressure was monitored using sphygmomanometer and stethoscope. The systolic pressure was noticed as 146 mmHg and diastolic pressure was noticed as 96 mmHg. The patient was advised to take 30 ml of *J. adhatoda* leaves decoction with 1 ml of honey mixed in it for about 3 days (Morning and night after meals). And advised to follow walking and dietary restrictions in salt intake. The patient was followed for 3 days.

Case 6:
A case of 41 years female came with the symptoms of palpitations, giddiness, drowsiness without any history of hypertension, diabetes mellitus, ischemic heart disease and bronchial asthma. The blood pressure was monitored using sphygmomanometer and stethoscope. The systolic pressure was noticed as 140 mmHg and diastolic pressure was noticed as 90 mmHg. The patient was advised to take *J. adhatoda* leaves decoction 30 ml with 1 ml of honey mixed in it for 3 days (Morning and night after meals). And advised to follow some physical activity such as walking and diet restriction in salt intake. And the patient was monitored for 3 days.

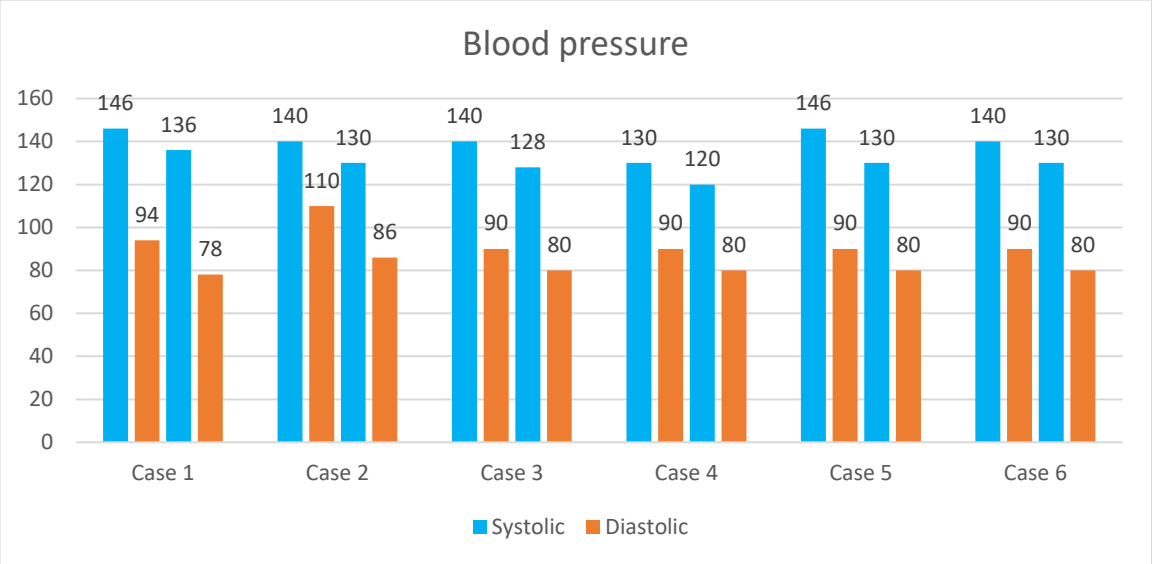
3. RESULTS
In this case series, all the patients were newly diagnosed cases of Stage I hypertension without any history and advised to take J. adhatoda leaves

decoction 30 ml with 1ml honey mixed in it for 3 days (Twice a day after food) and after 3 days, on 4th day morning the blood pressure was monitored using Sphygmomanometer and stethoscope. The findings were shown in table 3.1 and fig. 3.2

Table 3.1 Blood pressure monitored before and after intervention with *J. adhatoda* leaves decoction

Patient	Age/Sex	Before intervention-Blood pressure	After intervention-Blood pressure	Past history of hypertension or any co-morbidities.
Patient 1	35/F	146/94 mmHg	136/78 mmHg	No
Patient 2	28/F	140/110 mmHg	130/86 mmHg	No
Patient 3	46/M	140/90 mmHg	128/80 mmHg	No
Patient 4	32/F	130/90 mmHg	120/80 mmHg	No
Patient 5	40/M	146/90 mmHg	130/80 mmHg	No
Patient 6	41/F	140/90 mmHg	130/80 mmHg	No

Fig 3.2 Blood pressure Before and after treatment with *J. adhatoda* leaves decoction



4. DISCUSSION

From the results, in newly diagnosed stage I hypertensive patients (systolic pressure 130-139 mmHg and diastolic pressure 80-89 mmHg) the blood pressure was reduced after intervention the mean difference of about 12 mmHg in systolic pressure and 14 mmHg in diastolic pressure with *J. adhatoda* leaves decoction without any adverse effects. The symptoms of the patients also improved to normal with the help of physical activities and healthy lifestyle. Some research articles also explored the anti-hypertensive activity and cardio protective activity of *J. adhatoda* leaves.

J. adhatoda is also used for lowering of blood pressure in mildly hypertensive patients [21]. *J. adhatoda* may provide a therapeutic benefit towards prevention and treatment of cardiovascular diseases [22]. Traditionally it was used for the treatment of various acute and chronic diseases and showed strong pharmacological activity particularly for bronchial infections, cough, bacterial infections, reproductive disorders, cardiac diseases and many more [23].

The chemical constituents present in *J. adhatoda* also revealed it anti-hypertensive and cardio protective activity. It possesses cardio protective activity by a significant reduction in cardiac depressant effect was observed in combination of vasicine and vasicinone. It was revealed that no effect has been shown by vasicinone (dl-form), however l-form it was weakly effective in stimulating cardiac muscles [24]. Sixteen triazole Ofornine mimics were synthesized from l-vasicine and screened in vivo for anti-hypertensive activity in wistar rats. Out of these molecules, the analog (S)-(-3-hydroxypyrrolidin-1-yl) (2-(pyridine-4-ylamino) phenyl) methanone displayed significant activity [25]. Its hypotensive, bronchodilator, expectorant, hypoglycemic, antibiotic, anti-tubercular and uterine activities have been proved by experimental and clinical studies [26].

Betaine present in *J. adhatoda* possess anti-hypertensive activity [27]. The chemical constituent Vasicine present in *J. adhatoda* possess anti- hypertensive activity [28]. In cardio protective activity, in combination of vasicine and vasicinone,

a significant reduction in cardiac depressant effect was observed; no effect was shown by vasicinone [29]. Both ethanolic and aqueous extract at dose 100mg/ml and 200mg/ml showed anti-inflammatory activity against Carrageenan induced paw edema in rat [30], formalin induced paw edema with ethanolic extract [31]. According to safety profile, in Ayurveda, human use of the leaf extract has been considered to be safe. However, the uterotonic and abortifacient activity prevents its use during pregnancy, particularly in higher doses of extracts [32], hence it was contraindicated during pregnancy induced hypertension. Other than this, *J. adhatoda* also contains antimicrobial activity [33] [34], Anti-allergy activity [35], Immunomodulator activity [36], Broncho-dilatory activity [37], Hypoglycemic activity [38], Anti-ulcer activity [39] and hepatoprotective activity [40]. The main purpose of this case series, was to explore the effectiveness of *J. adhatoda* leaves decoction in effective management of *Kurudhiazhal noi* (Systemic hypertension). From the results, it ensured the therapeutic effectiveness of J. adhatoda leaves decoction in management of *Kurudhiazhal noi* (Systemic hypertension).

5. CONCLUSION

From the results and discussion, the present study concluded that *J. adhatoda* leaves decoction was effective in management of *Kurudhiazhal noi* (Systemic hypertension) in newly diagnosed hypertensive cases. Thus, the study revealed that *J. adhatoda* leaves decoction can also be used as an emergency medicine during sudden increase in blood pressure (without any prior history of hypertension) without any adverse effects. However, a randomized study with larger population will further intensify its effectiveness in management of Systemic hypertension.

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Author's contribution:
The author Dr. Shamshalniha S conceptualized, executed the study and drafted the manuscript, Dr. Dowlathunnissa Begum G edited the manuscript, Dr. S.M. Chithra designed the study and Dr. N. Anbu edited and approved the study.
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