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SUMMARY AND CONCLUSION

Hypertension is a silent, invisible killer that rarely causes symptoms. Hypertension already affected one billion people worldwide leading to heart attacks and strokes. High blood pressure is ranked as the third most important risk factor for attributable burden of disease in south Asia. It exerts a substantial public health burden on cardiovascular health status and healthcare systems in India. According to the WHO (2008) estimates, the prevalence of raised blood pressure in Indians is 32.5 per cent (33.2 per cent in men and 31.7 per cent in women). However, only about 25.6 per cent of treated patients have their blood pressure under control, in a multicenter study from India on awareness, treatment, and adequacy of control of hypertension (WHO, 2011). The rates for hypertension in percentage are projected to double in India by 2025 (Anchala *et al*., 2014).

Apart from the genes and environmental factors, obesity, sedentary lifestyle and dietary habits are the important contributors of increasing prevalence of hypertension even in youngsters (Bhat *et al*., 2013). The potential cost-effectiveness and feasibility of dietary interventions and lifestyle interventions aim at reducing hypertension risk are of considerable interest and significance in public health. In particular, the effectiveness of restricted sodium or increased potassium intake on mitigating hypertension risk has been demonstrated in clinical and observational research (Perez and Chang, 2014). Number of studies suggested that yoga is an effective adjunct therapy for hypertension and worthy of inclusion in clinical guidelines which help to increase physical activity, reduce stress and cultivate healthy lifestyle and dietary pattern (Tyagi and Cohen, 2014).

To popularize and stimulate practical application of dietary and lifestyle interventions, evidence based results are needed. There are many studies carried out in India to predict the prevalence of hypertension but only very few studies are undertaken on the application of non-pharmacological treatment for hypertension in India. Hence the present study is undertaken with the following objectives:

- ✓ Study the prevalence of hypertension in urban and rural areas
- ✓ Determine the associated etiological factors among the selected hypertensives
- ✓ Assess the demographic profile, dietary habits, lifestyle pattern and nutritional status of the selected adult hypertensives
- ✓ Intervention with functional foods and lifestyle modification strategies
- ✓ Evaluate the impact of intervention strategies

The methodology involved in the present study is given below.

Phase I –Selection and Grouping of hypertensives

Health camps were conducted at selected rural and urban areas of Coimbatore district, Tamil Nadu and hypertensives patients were identified with the help of medical practitioner and a group of medical assistants. About 256 hypertensives from rural and 257 hypertensives from urban identified in the age group of 25-55 years were selected for the research. The demographic details, dietary habits, family and personal medical history, food habits and lifestyle pattern like history of smoking, tobacco use, alcohol intake and their psychosocial behavior were elicited from selected 513 hypertensives using a standardized questionnaire.

Global Physical Activity Questionnaire (GPAQ) given by WHO (2015) was used to elicit the information on the physical activity pattern and anthropometric measurements namely weight, height, waist/hip ratio and BMI were recorded for all the 513 selected hypertensives in urban and rural areas. The Food intake pattern of the hypertensives was recorded using 24hr recall method. The blood parameters namely fasting blood glucose, postprandial blood glucose, lipid profile, serum sodium and potassium levels were analysed using standard procedure for the sub samples (90 men and 90 women) in a laboratory before and after intervention. Blood pressure was also measured once in a week during intervention period.

Phase –II – Formulation and evaluation of supplement

A number of studies showed that diet high in potassium & low in sodium is therapeutic in the case of hypertension and intake of pulses reduced the activity of angiotensin-converting enzyme (ACE) that constricts blood vessels which raises blood pressure (Campose *et al*., 2013). Based on these facts the foods rich in potassium and low in sodium namely red gram dhal (10g), green gram (10g), cow pea (10g), moth beans (15g), coconut de-oiled (15g), banana powder (30g) and jaggery (10g) were selected to formulate the supplement. The selected pulses and coconut deoiled meal were cleaned, powdered and mixed together in given proportion with banana powder. Nutrients namely energy, protein, fat, potassium and sodium present in the supplement were calculated using nutritive value of Indian foods by Gopalan *et al*., (2012). The 100g of selected formulated mixture provided nearly 26 percent of the daily requirement of the potassium.

Various traditional recipes namely chapatti, adai, dosai, rotti, pongal, sweet bar, uppuma, porridge and laddu were prepared with the supplement. To find the highly acceptable product organoleptic properties of the prepared recipes were evaluated using 9 point hedonic scale. The sweet bar which got maximum score among the recipe was selected for supplementation.

Phase –III – Dietary Intervention

For dietary intervention, 60 hypertensive men and 60 hypertensive women were selected based on the inclusion and exclusion criteria as given below.

Inclusion Criteria	Exclusion Criteria
▪ Blood pressure: SBP 120-129 mmHg/DBP80-89 mmHg (Prehypertensives), ▪ Age: 25 – 45 yrs ▪ Sex: Male and Female ▪ Duration of the disease : < 5 yrs ▪ Not taking antihypertensive medication ▪ Free of complications ▪ Willingness to participate in feeding trials	▪ Blood pressure: SBP >129 mmHg / DBP >89 mmHg ▪ Age: <25 &>45 yrs ▪ Duration of the disease :>5 yrs ▪ Taking antihypertensive medication ▪ With complications : CVD, Diabetes, Kidney disorders

The selected hypertensives were grouped into experimental Group (DIM with 30 men) and Group (DIW with 30 women) and the control groups namely Group (CTM with 30 men) and Group (CTW with 30 women). The hypertensive men and women were informed on the clinical trial and the nutrient content of the food supplement. The written consent was collected from the study subjects and they were thoroughly informed on the methodology of the supplementation trial.

The six pieces of sweet bar prepared from 100 g of the selected food mix was given to the subjects every day and instructed to consume three pieces in the midmorning and three pieces in the evening as a nutritious snack regularly. Supplementation was carried out for the period of six months. The consumption of the supplement was thoroughly monitored by the investigator. Consequently nutrition education was given to the experimental subjects.

The control group did not receive any food supplementation and nutrition education. Blood pressure was measured for experimental and control group weekly once by the investigator.

Phase - IV Lifestyle Interventions

The hypertensives were grouped into Group (LIM includes 30 men) and Group (LIW includes 30 women) based on the above said inclusion and exclusion criteria and each had their respective control groups CTM and CTW. The subjects were oriented with the importance of lifestyle modification strategies. Professional trainer from reputed institute trained the experimental group on yoga asanas, pranayama, meditation and laughing therapy for a period 4 days, 2hrs/day. After the training period, they were instructed to practice the same for 45 minutes/day for at least 6 days in a week, for a period of 120 days. Nutrition education was given to the experimental groups by using specially prepared booklet, pamphlet, presentation of slides, group discussions and personal counseling. The control groups namely (CTM and CTW) did not receive any training and nutrition education.

Impact of the interventions was evaluated through anthropometric measurements, biochemical parameters and blood pressure recorded before and after the intervention period.

The salient findings of the study is summarized and presented below.

Base line survey

- Most (42 per cent) of the selected hypertensive men and women in both rural and urban areas were in the age group of 40-49 years. Among 20-29 years, the percentage of hypertensive men (9-16 per cent) was greater than women (2–8 per cent). Men were prone to hypertension at early age than women in both areas.

- About 70 to 72 per cent of rural and 83 to 87 per cent of urban hypertensives were in nuclear family system and joint family system was still existed in more than one fourth of the rural hypertensives.

- Nearly three fourth of the selected hypertensives were Hindus and the remaining belonged to minority communities. Among the minority communities 17 - 20 per cent were Christians and less than 10 per cent were Muslims in both rural and urban.

- Greatest percent of rural men and women were not crossed their school education when compared to urban men and women. In urban areas, 35 per cent of men and nearly one fourth of women were graduates succeeded by 20 per cent and 17 per cent of post graduates in men and women. About 13 per cent of women and 10 per cent women were completed doctorate in urban.

- With regard to occupation, the professionals, service and sales personnel were more among the selected urban hypertensives where as skilled labours other than agriculture labours, service and sales, house wives were in greater percent among rural. It can be stated that occupational stress might be one of the reason for hypertension but the influence varied with different individuals.

- Greatest percent of rural hypertensives belonged to low income group but in urban it was middle income group.
- About three fourth of rural and urban hypertensives followed non vegetarian diet whereas the rest were vegetarians and ova vegetarians.
- More than one half of the selected rural and urban hypertensives were regularly consuming 3 meals with snacks every day where as the irregular eating pattern was seen more in rural areas (12 per cent) and 3 meals with snacks was observed higher in urban areas (61 per cent) than their counter parts.
- Only less than one quarter of rural and urban were consuming less than 10 g/day of salt where as the rest three fourth consumed more than twice the recommended amount given by WHO.
- The saturated fat intake was found to be more common in both rural and urban areas although it differed in type. In rural areas more than 60 per cent of selected hypertensive men and women used palm oil regularly. Even palm oil intake was seen in 38-41 per cent of urban men and women hypertensives and one half of the urban used sunflower oil and butter and ghee regularly.
- The present study observed that increased consumption of fleshy foods in most of the selected hypertensives irrespective of the area and it was more in urban when compared to rural.
- Increasing trend was seen in processed foods namely jams, pickle, masala powers and ready to eat food like noodles, packed chapathies, parrotta, sevai and other ready mix powders consumption among both rural and urban hypertensives.
- The fat rich bakery products were consumed more often among hypertensives. Nearly one half of the rural hypertensive men consumed bakery products weekly twice and one fourth had it daily. In urban, more than one quarter (34-36 per cent) consumed the bakery products daily.

- Irrespective of the area and sex, the urban hypertensives frequently consumed salt and fat rich fast foods than their counter parts in rural. Generally the fried foods were consumed as snacks among Indians often. Similarly, the present study also showed greater consumption of fried foods among the rural and urban hypertensives and compared to rural, consumption frequency was more in urban areas.
- Carbonated beverages like coco cola, sprite, pepsi, miranda etc were consumed more frequently by urban subjects when compared to rural subjects. Even 7 per cent of urban men consumed these drinks daily due to one or other reasons.
- About 40 per cent of urban men and 36 per cent of urban women ate at least one meal weekly once in eating outlets. Among rural six per cent of men were having food outside daily and even 15 per cent of rural women had practice of visiting food outlets at least weekly once. Compared to women, men in both areas visited eating outlets more often.
- It was adverse to note that the utmost part of the selected hypertensives in both rural and urban areas was not doing any physical exercises. It might be due to their lack of interest and lack of time. Some form of physical exercise like walking, cycling, jogging, gardening, shuttle etc was observed in 22 - 35 per cent of rural and 36-45 per cent of urban hypertensives. Women were generally physically inactivity than their counter parts.
- There was not much difference noticed between rural (56 per cent) and urban (58 per cent) men in pan chewing practice. This habit was seen in greatest per cent of rural hypertensive women when compared to all others. Even 15-18 per cent of urban men and women and seven per cent of urban men were chewing pan daily. Compared to urban hypertensives, rural hypertensive used pan more often and in more numbers.
- Among the selected hypertensives more than one half of the men in rural (59 per cent) and urban areas (62 per cent) were consuming alcohol.

About 33-41 per cent of men consumed twice in a week and even 10 -15 per cent consumed alcohol every day. Quantity of consumption per week was observed to 90 ml to 135 ml per week in one half of rural whereas in urban one in two consumed 135 ml – 180 ml per week. The increased alcohol consumption pattern in both urban and rural areas was one of the adverse conditions of changing lifestyle pattern.

- One in two selected hypertensive men were smokers. The smoking habit was predominant in more than one half of rural and urban hypertensives and also smoking beedi (69 per cent) was greater among the rural men whereas cigarette smoking (82 per cent) was predominant among urban men. Greater part smoked more than 6 numbers/week for a period of 6-10 years.

- Greatest part of the selected hypertensives in rural (men: 64 per cent and Women: 71 per cent) and urban areas (Men: 68 per cent and Women: 58 per cent) were short tempered in emotional nature.

- Nearly three in four among both rural and urban hypertensives were leading stressful family life due to one or more reasons and only one in four were having peaceful family life.

- The present study observed that irrespective of the sex and area, work life imbalance, financial stress and family issues were the most predominant causes for accumulating stress in their life. Among all financial issue was greatest stress among rural whereas it was work-life imbalance in urban areas. Due to one or other reasons most of the selected hypertensives were packed with stress.

- Family history of hypertension was observed in 31-32 per cent of selected hypertensives. Among the rural hypertensive, maximum per cent were having family history of obesity, followed by diabetes and hypertension whereas in urban hypertensives, the greatest per cent were quoted family history of diabetes, succeeded by obesity and hypertension.

- Regarding personal medical history, obesity was found to be very common among the majority of the selected hypertensive men and women from both rural and urban areas. Next to obesity, hyperlipidemia was prevalent among men in rural (14 per cent) and urban (19 per cent) where as diabetic was more common in rural (19 per cent) and urban (21 per cent) women.
- Not all the known hypertensives were under treatment, only 81 in rural and 112 in urban were under treatment. Most of them followed allopathic treatment for hypertension.
- The regular treatment and control of blood pressure was observed to be more in urban when compared to rural and the education status and economic status might have influence on their regularity.
- Awareness on hypertensive complication was seen in less than half of the selected hypertensives. It insisted the well planned awareness campaign to enrich the knowledge on hypertension which might in turn help to reduce the prevalence and further complications.
- Inadequate awareness level on hypotensive diet was observed equally among rural and urban hypertensives but when compare to rural it was found to be better in urban areas.
- According to Global Physical Activity Questionnaire (GPAQ) given by WHO, it was pleasant to note that almost all the selected hypertensives from rural and urban were having moderate or vigorous work related activities at least for 10 minutes. But it was alarming to note that physical activity in transport was observed to be low especially in urban and the recreational activities were not seen in most of the hypertensives.
- Compared to men, more women were physically inactive. The recreational activities were seen more in urban than in rural whereas the work and transport related physical activities were greater in rural than urban.
- About 6-8 hrs of sitting and reclining activities was seen in one quarter of the urban and 15 to 17 per cent of the rural hypertensives. No one among

the selected hypertensives was observed in highly active range (>1200 MET-minutes).

Nutritional and health status

Blood pressure level

- Classification of selected hypertensives based on the blood pressure level revealed that greatest per cent of the urban and rural prehypertensive men were in the age group of 30-39 years, followed by 40-49 years but in women, majority were in the age group of 40-49 years followed by 30-39 years in both rural and urban areas.
- It was shocking to note that about 14 per cent and 5 per cent of prehypertensive men and women in rural and 21 per cent and 13 per cent of men and women prehypertensives residing urban were in the age group of 20 -29 years.
- Greatest part of hypertensive stage –I men was in 40-49 yrs whereas in women it was 50-59 yrs women. About seven to ten per cent in rural and urban were found to be the victim of hypertension stage I at the age of 30-39 years.
- About 62 per cent of urban men were prone to hypertension stage-II at the age of 30-39 years. When compared to women, men in both rural and urban areas were more prone to hypertensive severity and the most affected crowd was urban men.
- Even at the age of 20-29 yrs, the urban men were found to have SBP>130 mm Hg and DBP >82 mm Hg where as similar range was seen in rural men only after 30 years of age.
- In hypertension stage-I, 40-49 years urban men recorded highest SBP as 151.2 mm Hg and the rural men recorded highest DBP as 94.2 mm Hg. Except rural and urban men, other hypertensive stage –I women recorded SBP and DBP in increasing order with increase in age.

- Among hypertensives stage II, urban hypertensive men recorded highest SBP and DBP level when compared to others with respect to age. It was dreadful to note that hypertension stage –I and stage –II, the urban recorded more SBP than the rural at all age groups.

Anthropometric measurements

- The mean weight of the selected hypertensives was found to be more when compared to standard weight given by ICMR. Compared to selected rural hypertensives, urban hypertensive men and women had higher weight in prehypertension, hypertension stage -I and hypertension stage –II.

- BMI of both rural and urban hypertensives increased with increase in blood pressure. The prehypertensive men in rural and urban men recorded 23.8 and 24.8 where as prehypertensive women in rural and urban women recorded BMI as 25.9 and 27.5. Hypertensive stage-I and hypertensive stage –II showed BMI more than the prehypertensives.

- On the whole BMI was found to be higher in urban hypertensives when compared to rural hypertensives and it was higher in women when compare to men.

- Obesity stage –I was more prevalent at different level of blood pressure and prevalence of obesity among both rural and urban hypertensives was increased with increase in blood pressure level. About 40 per cent, 19 per cent, 25 per cent and 12 per cent of prehypertensive rural and urban men and women were observed to have normal weight.

- The rural women recorded WHR greater than urban women whereas the rural men displayed WHR lesser than urban men. Prehypertensive rural and urban men and hypertensive stage –I rural men were observed to have WHR within the normal range where as it was not seen in women at any blood pressure level.

- It was saddening to note that more than one part of the selected hypertensives were found to have central obesity and also not much difference was noticed between rural and urban.

Food and nutrient intake

- Generally the selected hypertensives had poor food choice and mostly rich in cereals and fats and low in pulses, vegetables, milk and milk products and other hypertensive foods. It was good to note that fruits intake especially locally available citrus fruits namely guava, gooseberry etc was observed to be more in all hypertensives except rural women.
- The nutrient intake of hypertensives was excess in energy, fat and sodium and inadequate in protein, fibre, potassium, calcium and iron. Adequate intake of B complex vitamins and vitamin C was observed in most of the selected hypertensives. Food and nutrient intake was similar in both rural and urban hypertensives.

Impact of dietary intervention

- The experimental group showed significant weight reduction of 4.30 kg and 4.64 kg in group DIM and group DIW respectively at the end of dietary intervention whereas it was not seen in the control groups. Similarly the BMI also found to show significant decrease in both the experimental groups compared to control groups. The reduction was more in group DIW in comparison with group DIM.
- Similarly significant decrease was seen in the Waist Hip Ratio (WHR) and Waist Height Ratio (WHtR) of the both the experimental groups and it was more in group DIW than group DIM. In contrast to the experimental groups, control groups showed slight increase in the anthropometric measurements.
- In group DIM, the percentage of normal was increased to 40 per cent from 10 per cent and consequently at risk of obesity, obesity stage –I and obesity stage –II was declined to 33 per cent, 20 per cent and seven per

cent respectively. It was good to note that the normal status was increased from 3 per cent to 17 per cent in group DIW and subsequently at risk of obesity and obesity stage –II was reduced to 10 per cent and 17 per cent respectively at the end.

- The group DIM showed SBP and DBP as 122.33 mm Hg and 80.80 mm Hg and the group DIW displayed SBP as 120.47 mm Hg and DBP as 79.33 at the end.. The decline in SBP was more (8.30mm Hg) in group DIM when compared to group DIW (7.30 mm Hg) whereas the decrease in DBP was more in group DIW (3.90mm Hg) in comparison with group DIM (3.13mm Hg). In contrast, the control groups showed slight increase in SBP and DBP level.
- The dietary intervention was resulted in significant reduction in Fasting Blood Glucose (FBG), Postprandial Blood Glucose (PPBG) and glycosylated haemoglobin (HbA1c) levels in the experimental groups where as the changes in the control groups were not statistically significant. The reduction in FBG was more in group DIW and the decrease in PPBG was greater in group DIM when compared to their counter parts in experimental groups. The depletion in HbA1c was similar in both the experimental groups.
- At the end of dietary intervention total cholesterol level in the experimental groups were found to be decreased by 14.10 mg/dl in group DIM and 12.57 mg/dl in group DIW whereas the control groups level were found to be increased by 0.82 mg/dl and 0.99 mg/dl in group CTM and group CTW.
- With respect to triglycerides, group DIM showed a significant decrease from 159.81 mg/dl to 148.05 mg/dl by 11.76 mg/dl and group DIW recorded a significant reduction from 148.59 mg/dl to 137.87 mg/dl by 10.72 mg/dl at the end.
- The HDL level was increased by 1.1 mg/dl in group DIW and 0.82 in group DIM and VLDL and HDL showed significant reduction in both the experimental groups at the end of dietary intervention.

- Both the experimental and control groups showed serum sodium level at the higher end of normal range and serum potassium level at the lower end of the desirable level at the beginning of intervention.
- The experimental group DIM showed a reduction of 7.09 mEq /L and group DIW displayed a decrease of 6.28 mEq /L in serum sodium level whereas the control groups, CTM and CTW showed an increment of 0.62 mEq /L and 0.50 mEq /L in serum sodium level.
- Both experimental groups DIM and DIW showed statistically significant increment in serum potassium level whereas the changes were not significant in control groups.

Impact of lifestyle intervention strategies

- Both the experimental groups LIM and LIW showed statistically significant reduction in weight and BMI at ($p<0.01$) level. The depletion was observed to be more in group LIM when compare to LIW in weight whereas BMI decrease was greater in group LIW in comparison with their counter parts.
- At the end of lifestyle intervention significant percent of obesity stage II and obesity stage I were migrated towards their lower risk group in experimental group LIM and LIW whereas control groups CTM and CTW hypertensives with normal BMI was vanished and recorded subsequent increase in higher grades of obesity.
- The experimental group LIM and LIW recorded significant reduction in WHR and WHtR at ($p<0.01$) level. At the end, the lifestyle intervention showed significant reduction in all the anthropometric measurements whereas control groups showed increment was noted in control groups.
- With respect to blood pressure level, the group LIW recorded a depletion from 129.5 mm Hg to 120.90 mm Hg in SBP and from 83.50 mm Hg to 79.37 in DBP. The group LIM showed a decrease in SBP from 130.63 mm Hg to 122.33 mm Hg and reduction in DBP from 83.5 mm Hg to 79.03 mm Hg. The decrease was found to be more in group LIW when compared to group LIM.

- In the experimental group LIM, the FBG level was decreased from 94.83 mg/dl to 87.94 mg/dl by 6.89 mg/dl and in group LIW, it was reduced from 93.80 mg/dl to 85.82 mg/dl by 7.98 mg/dl at the end. Both experimental groups illustrated statistically significant at ($p<0.01$) level reduction in PPBG and HbA1c levels.
- The lifestyle intervention showed statistically significant beneficial changes in serum lipid profile at the end. Total cholesterol was reduced by 17.08 mg/dl in group LIM and 18.65 mg/dl in group LIW and triglyceride was depleted by 20.4 mg/dl in group LIW and by 15.14 mg/dl in group LIM. VLDL and LDL also noted to have noteworthy reduction in experimental groups.
- On completion of intervention trial, the HDL level in group LIM increased from 46.71 mg/dl to 51.30 mg/dl and in group LIW, it was elevated from 49.22 mg/dl to 54.58 mg/dl where as in control group CTM and group CTW, negligible depletion of HDL level was noted.
- With respect to serum sodium the experimental groups recorded a statistically significant reduction of 4.61 mEq/L and 5.73 mEq/L in groups LIM and LIW respectively.
- The increment showed in the serum potassium level of the group LIM and LIW was found to be statistically significant at ($p<0.01$) level.

Comparison of intervention trials

- It was good to observe that both dietary intervention for a period of 180 days and lifestyle intervention for a period of 120 days had resulted in significant reduction in anthropometric measurements among the experimental groups.
- The reduction in weight and BMI was found to be more in experimental groups of lifestyle intervention when compared to dietary intervention even though its duration was short in comparison with dietary intervention.

- Fasting blood glucose, postprandial blood glucose, glycosylated haemoglobin were found to be reduced more in lifestyle intervention when compared to dietary intervention.
- Total cholesterol, Triglyceride, VLDL, LDL reduction was found to be more in lifestyle intervention. The HDL was increased almost 4.5 times in lifestyle intervention groups when compared to dietary intervention groups.
- The dietary intervention groups recorded reduction of 6.28-7.09 mEq/L in serum sodium level and increment of 1.0-1.02 mEq/L in serum potassium level. These changes were greater when compared to the changes in the lifestyle intervention groups.
- Among the lifestyle intervention groups, group LIW showed the highest reduction in SBP (8.6 mm Hg) and group LIM showed greater reduction in DBP (4.47 mm Hg) where as the in dietary intervention groups, SBP reduction was more in group DIM (8.12 mm Hg) and DBP depletion was more in group DIW (3.9 mm Hg).

Conclusion

The present study revealed that Including functional foods which have hypotensive component in regular diet for a period of 180 days had resulted in potential reduction in blood pressure and other risk factors like weight, WHR, WHtR, blood sugar and serum lipid profile, serum sodium and increase in serum potassium inturn helpful to prevent the further complications. Lifestyle intervention close down the physical inactiveness, reduces mental stress and developed healthy lifestyle and dietary habits among the hypertensives. This in turn helped to decrease weight, waist, blood glucose level and lipid profile and blood pressure greater than the dietary intervention in a period of 120 days.

The treatment of hypertension is no longer limited to the simple prescription of pharmaceuticals. For many patients, maximal medical therapy was insufficient to adequately treat refractory hypertension. Despite the abundance of pharmaceutical options for the treatment of hypertension, dietary and

lifestyle modification remained an important approach in management of hypertension.

Recommendations

- Prevalence of prehypertension can be studied on a large –scale.
- Integrated dietary and yoga intervention can be undertaken to study the combined effect.
- Long term lifestyle intervention with yoga therapy among prehypertensives can be instigated.
- Population based awareness campaign must be initiated to eliminate the raising burden of hypertension.
- More research can be undertaken to study the impact of different types of functional foods on hypertension
- Government must enforce rules and regulation to food processing industry to minimize the usage of sodium in processed foods.
- Private sectors can be encouraged with monetary benefits to improve the availability and accessibility of low-salt products