Original Research Article

Prevalence of Hypertension Among Fisherman Community in The Island of Bengre, Mangalore

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ABSTRACT

Hypertension is one of the major causes of disease and disability worldwide. It is associated with an increased risk of stroke and myocardial infarction etc.It is easy to detect by simple means, but most of them are unaware of their hypertension and had no treatment. In those on treatment, blood pressure control is unsatisfactory.

The factors affecting the prevalence of hypertension are many that including ethnicity, life style changes and diet. Epidemiological data shows variation in prevalence of hypertension. Some show an increase in blood pressure with age, while others show no significant increase. Present study examined 1016 (M: 500; F: 516) from local fisherman community in the age group of 20-70 years. Study showed 4.62% prevalence of hypertension (M: 4.40; F: 4.84) and 40% were aware of their hypertensive state. Only 4.2% were on regular treatment and the rest, noncompliant population had uncontrolled blood pressure. None had any idea about hypertensive related risk factors, symptoms, complications and preventive measures. Hypertension among fisherman community showed lower prevalence than compared to various prevalence studies in India.

Key words: Hypertension, Prevalence, Risk factors

INTRODUCTION

Hypertension is prevalent throughout the world, but it is potentially preventable. It is one of the major causes of disease and disability in the adult population all over the world. [1-2]

High blood pressure is associated with an increased risk of stroke, myocardial infarction, heart failure, renal failure, and cognitive impairment. Systolic blood

pressure above 115 mm Hg is the most important determinant of the risk of death worldwide. This alone being responsible for 7.6 million cardiovascular deaths annually, accounting to 20-50% of all deaths and morbidity and contributes to disability and health care costs.[3-5]

Hypertension is the commonest cardiovascular disorder posing a major public health challenge to societies which are in socioeconomic and epidemiological transition. Two major contributors to global cardiovascular disease mortality and disability are coronary heart disease and cerebrovascular disease. The relative burden of these varies across the developing countries.[6] Our country being no exception, it is rather alarming. Globally and in our country, the proportion of elderly population is on the rise and hypertension is extremely common.[7]

The awareness and proper control of high blood pressure have contributed to dramatic reduction in morbidity and mortality attributable to hypertension.[8] Hypertension per se is not a disease. It is at best a risk factor for future degenerative disease like stroke, heart attack and renal failure.[9] Despite the fact that hypertension is easy to detect by simple means, most of the hypertensive population are unaware of their hypertension and have had no treatment. In those who are being treated, blood pressure control is unsatisfactory in most cases. [10-11]

The factors affecting the prevalence of hypertension are many that include nationality and ethnic group, urbanization and industrialization, population migration, crowding and changes in life style including diet.[12] Epidemiological a distinct variation in prevalence of hypertension in most industrialized population blood pressure rises with age, and in most non industrialized population in whom the rise in blood pressure with age is by no means an obligatory finding. Some population show an increase in blood pressure with age, while others show no significant increase as shown in Pacific Island population studies.[12]

In India, there are only very few community based studies which have estimated prevalence of hypertension. Present study aimed at looking the pattern of blood pressure and prevalence of hypertension in the local fisherman community in the outskirts of Mangalore.

METHODOLOGY

The study was conducted on fisherman community residing in Bengre. Bengre is a small Island about a kilometer off the shore of Mangalore, it is thickly populated and most of the inhabitants are the traditional fisherman regardless of caste and religion. A door to door field survey conducted on the adult population in the age group of 20-70 years was surveyed. Each participant's socio-demographic variables such as age, marital status, religion, education, income, diet, habits, anthropometric measurements height, weight, were recorded.

Blood pressure was recorded in a standardized fashion using equipment that met certification criteria.[8, 13-14]

Following defined criteria's used for purpose of study

Definition of hypertension:

The hypertension status of the study participants was assessed by using standard criteria formulated by the WHO and the Sixth Report of the Joint National Committee on Prevention, Detection, Evaluation and Treatment of hypertension.[11] Hypertension was defined as Systolic Blood Pressure (SBP) $\geq$ 140mm Hg, and/or Diastolic Blood Pressure (DBP) $\geq$ 90mm Hg and/or treatment with antihypertensive medication. [11]

Definition of awareness:

Awareness of hypertension was defined as the subject reporting a prior diagnosis of hypertension (or high blood pressure) made by health personnel.

Treatment of hypertension was defined as current use of a prescription medication for lowering elevated blood pressure among hypertensive subjects, in our sample, the only treatment considered was pharmacological.

Control of hypertension was defined as pharmacological treatment associated with SBP and DBP less than 140 and 90mm of Hg respectively.

RESULTS

Table-I

Socio-Demographic details N=47

Variables		Frequency	Percentage	Mean	Standard Deviation
AGE				52.53	9.77
Marital status	**Married**	44	93.6		
	Unmarried	3	6.4		
Religion	**Hindu**	46	97.9		
	Muslim	1	2.1		
	Christian	0	0		
Education in years				4.17	3.80
Occupation	**Fishing**	19	40.42		
	Fish marketing	4	8.51		
	Household	16	34.1		
	Fish Drying	8	17.0		
Fish consumption /day in grams	**200**	9	19.2	273.40	40.17
	250	7	14.9		
	300	31	65.9		
Alcohol consumption	**Present**	11	23.4		
	Absent	36	76.6		
Duration of alcohol consumption in years				17.45	6.26
Smoking in years				16.62	9.73
Tobacco consumption	**Present**	2	4.3		
	Absent	45	95.7		

Duration of tobacco consumption in years	**5 years**	1	2.1	7.5	3.5
	10 years	1	2.1		
Hypertension	**Present**	14	29.8	1.70	0.46
	Absent	33	70.2		
Duration of hypertension in years				3.43	3.76
Other disorders	**Paresis in left limb**	1	2.1	2.5	0.75
	Bronchial asthma	2	4.3		
	Diabetes mellitus	5	10.6		
Duration of other disorders in years				7.66	6.42
Family h/o Hypertension	**Present**	6	12.8		
	Absent	41	87.2		

GRAPH -I

Age and sex distribution of whole population

GRAPH-II

Prevalence of hypertension in Males & Females to the population surveyed
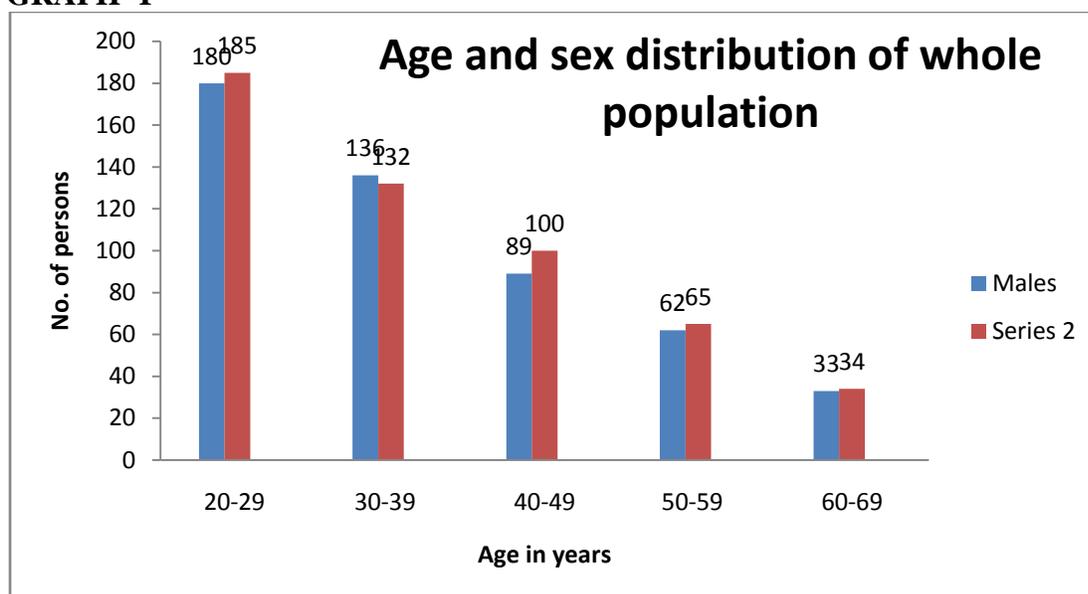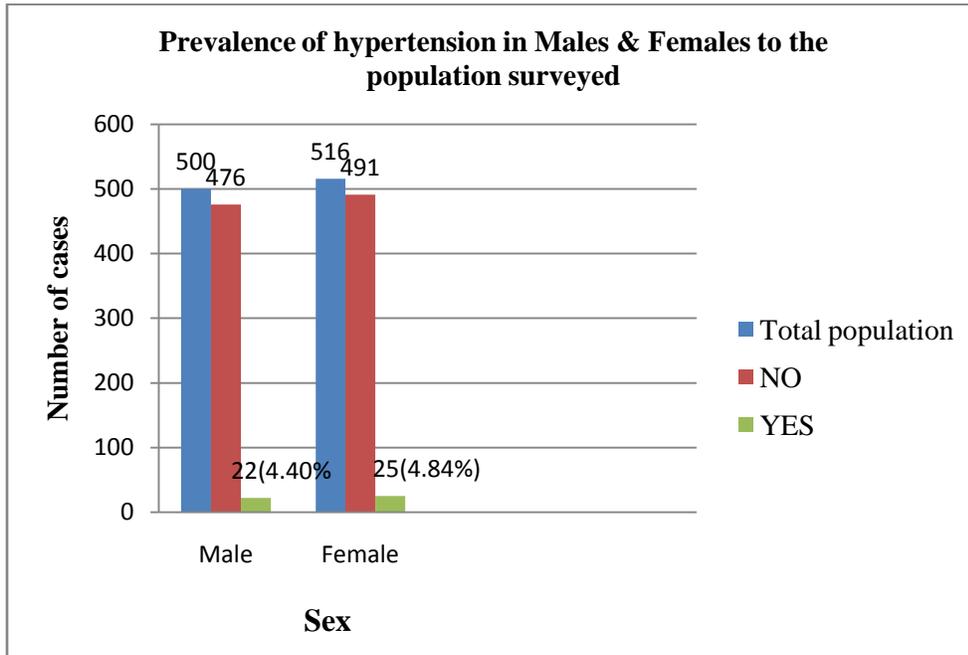
GRAPH-III

GRAPH-IV

GRAPH-V

GRAPH-VI

Mean systolic and Diastolic Blood pressures in Males by body Mass index

Body Mass Index

GRAPH-VII

Mean systolic and Diastolic Blood pressures in Females by Body Mass index
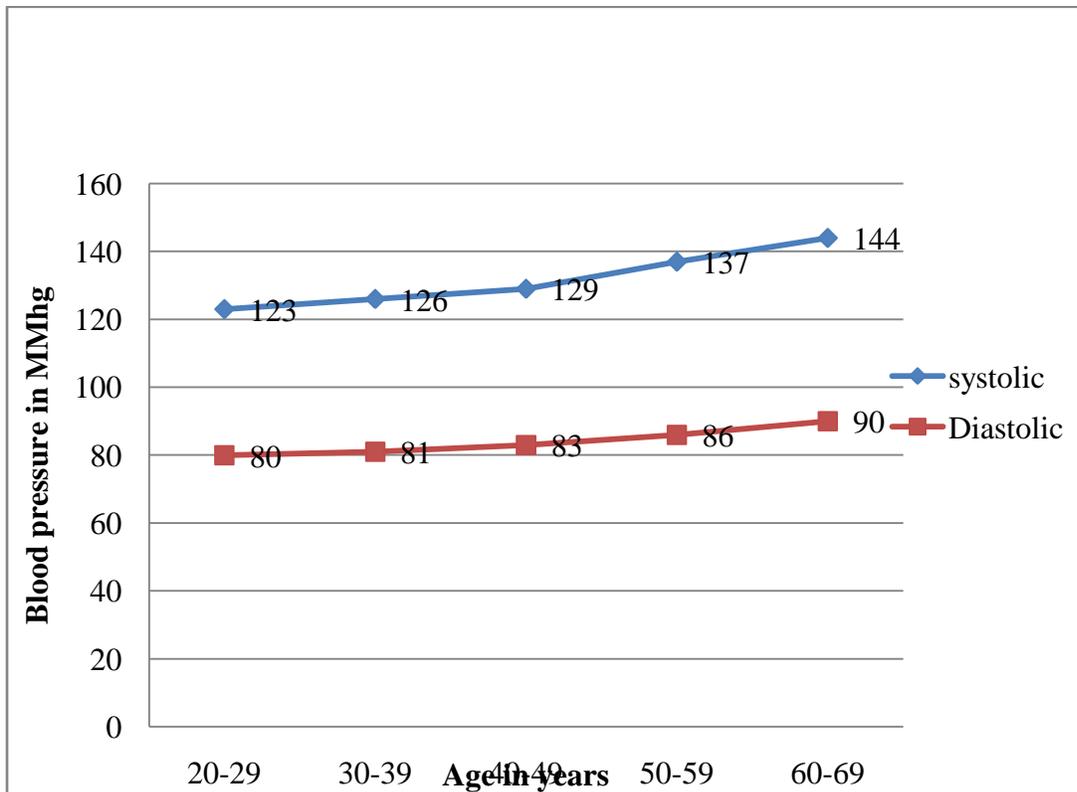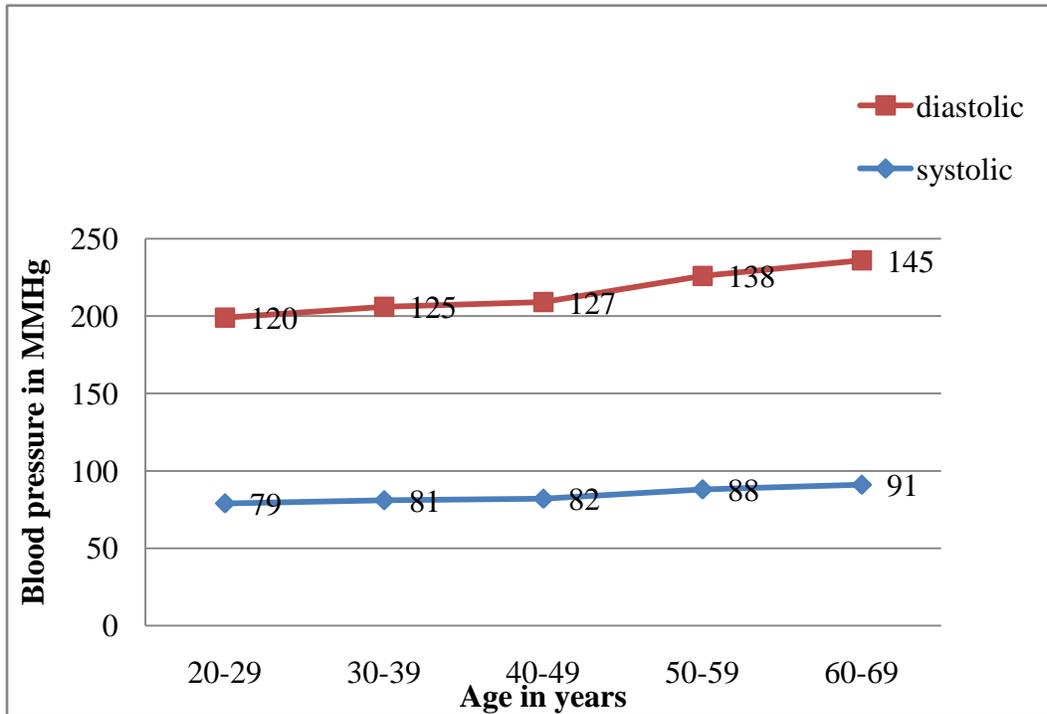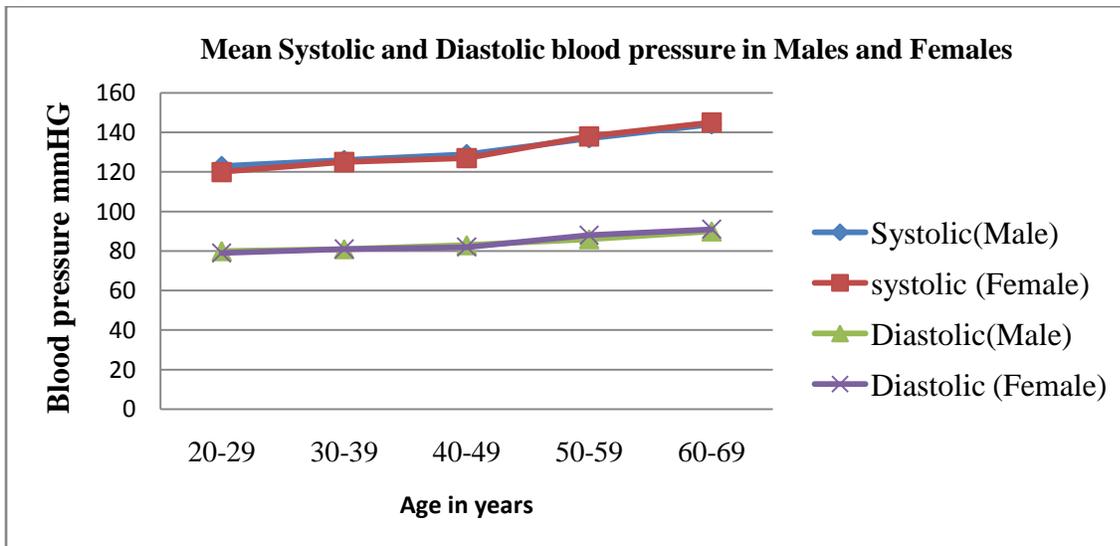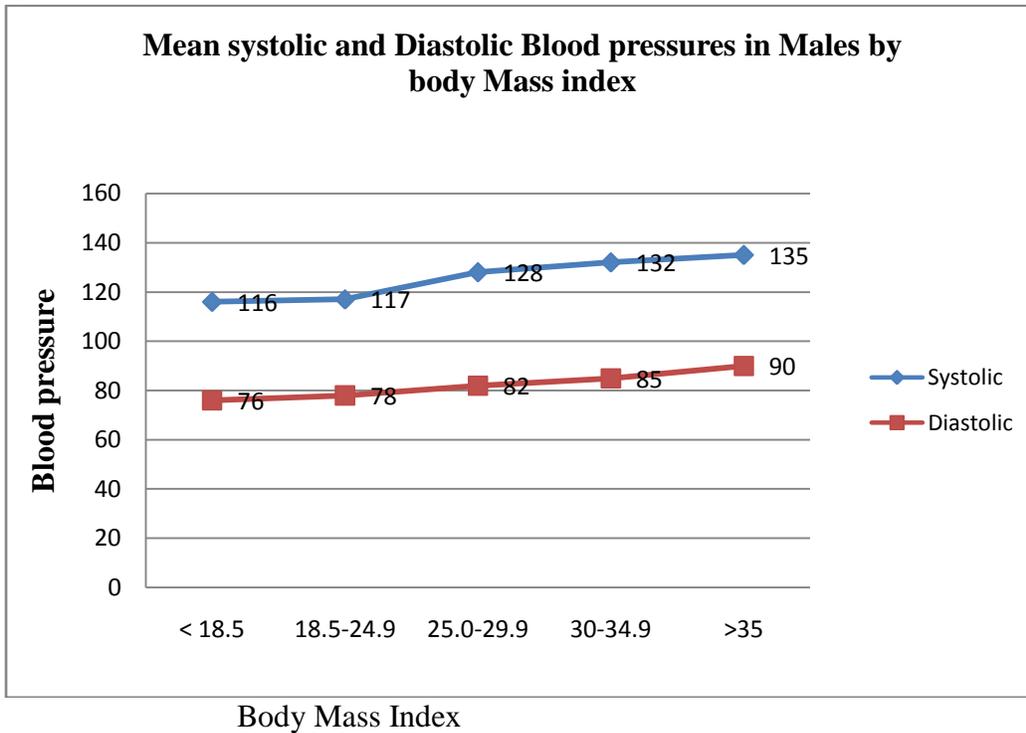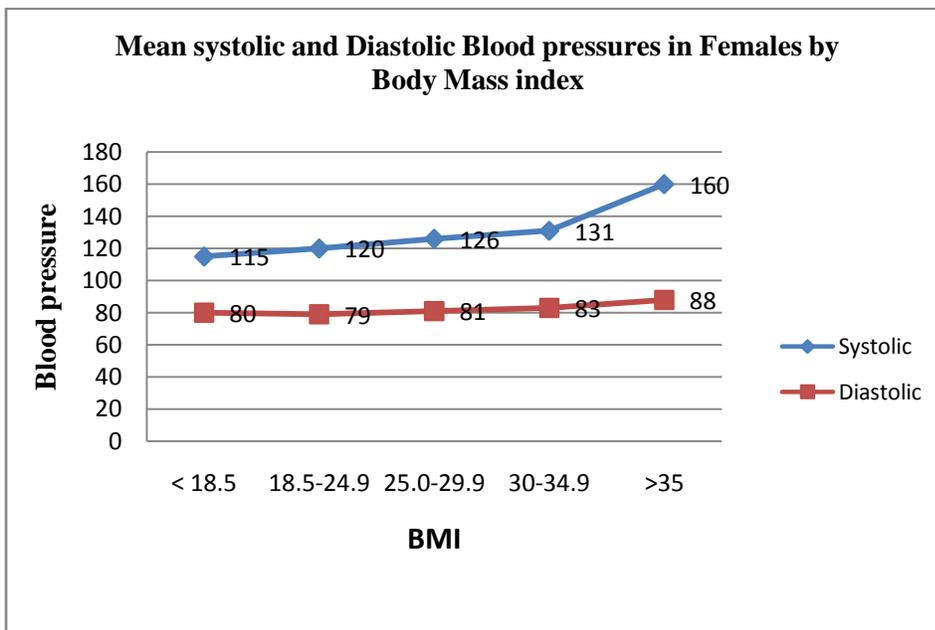
Table-II
Pearson correlation

		AGE	DIABETES	HYPERTENSION
AGE	Pearson Correlation	1.0	-0.088	-0.277
	Sig. (2-tailed)	0	0.55	0.059
DIABETES	Pearson Correlation	-0.088		-0.227
	Sig. (2-tailed)	0.55		0.12
HYPERTENSION	Pearson Correlation	-0.277	0.227	
	Sig. (2-tailed)	0.059	0.12	
FAMILY HISTORY OF HYPERTENSION	Pearson Correlation	0.212	0.28	0.029
	Sig. (2-tailed)	0.15	0.055	0.84

DISCUSSION

There is paucity of large authentic epidemiological studies on hypertension in our country. Approximately there are about thirty to thirty five epidemiological studies on hypertension prevalence in Indian Population being carried out. [15-38]
Chopra in 1942 and subsequently Dotto (1949), Dubey(1954) and Sathe (1959) reported meta-analysis of large scale epidemiological studies looking at the changing trends in prevalence of hypertension and mean blood pressure (BP) levels in India among urban and rural population. These studies reported prevalence of 1.24 ±0.2, 4.24 ± 0.4 and 3.03 ±0.3 percent in urban populations of Calcutta, Kanpur and Mumbai, respectively. However these studies had several shortcomings. They adopted differing examination techniques, differing diagnostic criteria and used screening blood pressure values for defining hypertension. With this entire pitfalls trend was towards higher prevalence rates.

Review of studies from 1963 till 2010 which adopted WHO guidelines to diagnose hypertension showed prevalence rates in the range of as low as 3.14 to as high as 50.04 %. [15-26]
Mathur et al, Malhotra, Gupta et al, Wasir et al and Chadda et al studied hypertension prevalence among urban population by adopting blood pressure $\geq$ 160/95 mmHg as hypertension defining criteria. These studies reported hypertension prevalence rates of 4.35, 6.2, 6.43, 3.14 and 13.14 percent respectively. [15-17, 19, 21]

On analyzing the entire population surveyed in these studies(i.e. 9705 males and 11719 females) in the age group of 18 to 65 years showed average prevalence of 10.31% (1001 males) and 12.7% (1488 females).

Later studies by Hussain et al ,Gupta et al,Anand,Bharucha et al,Shanthirani et al,

Mandal et al in urban population which adopted blood pressure ≥ 140/90 mmHg as defining criteria for hypertension, showed prevalence rate 6.15,30,26.78,45.5,19.77and 49.41 respectively. [20,22-26] The analysis of entire population surveyed in these studies(i.e. 8389 males and 5039 females) in the age group of ≥ 20 years showed average prevalence of 30.19% (3036.44 males) and 25.99% (1309.64 females) respectively.

Results of these two groups of studies showed that with much stringent defining guidelines and broad range of age groups, the prevalence of hypertension is high in urban areas. Male population showed higher trend compared to female population.

Similarly studies in rural population by Gupta et al, Wasir et al, Puri et al, Kumar et al, Joshi et al, Agarwal et al with defining criteria for hypertension as ≥ 160/95mmHg reported prevalence of 3.58,2.89,2.41,6.05,3.82,3.59 and 5.40 repectively. [27-28, 30, 32-34]

The analysis of entire population surveyed in these studies (i.e. 10916 males and 6185 females) in the age group in the range of 15 to 82 years showed average prevalence of 3.30 % (360.76 males) and 3.53 % (218.34 females) respectively.

Studies by Baldwa et al, Hussain et al, Prasanth et al, addo et al, Zhaoqing et al with hypertension defining criteria as ≥ 140/90 mmHg reported prevalence of 7.89,6.05,19.21,25.37 and 29.33 respectively. [29, 31, 36-38]

The analysis of entire population surveyed in these studies i.e. 9164 males and 7248 females in the age group in the range of 16 to 100 years showed average prevalence of 15.05 % (1379 males) and 10.69 % (7248 females) respectively.

Analysis of large pool of data from these studies, one can conclude that female preponderance in earlier studies may be attributed to blood pressure of 160/90 mmHg as criteria to define hypertension. Hypothetically it can be derived that large number of male population suffer from hypertension in the range of 140/90 mmHg to 160/95mmHg probably missed in the earlier studies.

Present study examined blood pressure among fisherman community with 140/90 mmHg as hypertensive defining criteria showed prevalence rate of 4.62%. [40-41] The prevalence is comparable to the urban and rural studies. [15-17, 19, 21, 27-28, 30, 32-34]

Present study results score higher by fact that it adopted much stringent hypertension defining criteria (i.e. 140/90) when compared above studies (i.e.160/90). Even on comparing studies with stringent WHO defining criteria, the results of this study show very low prevalence of hypertension. [20, 22-26]

Present study also showed a marginal higher prevalence of hypertension among women (F 4.84% > M: 4.40). On comparing mean arterial pressure among both sexes (Graph-V), the mean arterial pressure relatively lower in females in the younger age group, than in males of similar age group: but this difference is narrowed in the older age group (more than 50 years). Women in the post menopausal age group showed slightly higher Mean Arterial Pressure than men in the same age group. Results are comparable to most of the studies reviewed, but one can attribute reason for such cause is because of over-representation of female population in sample, higher body mass index among females than males and 81 % percent being in menopausal age.

Study by Shirakawa et al, analyzed by 10-year age groups (20s, 30s, 40s and 50s) to look into family history and aging as independent risk factors for the development of hypertension and diabetes. [49] He found that prevalence of hypertension increased

with age group either in the absence (12% in the 20s and 39% in the 50s) or in the presence (21% in the 20s and 59% in the 50s) of family history of hypertension. While the impact of family history on the risk of diabetes was strong and appeared to increase with age (4% in the 20s and progressively increased to 20% in the 50s.

The similar observation was noticed in present study, prevalence of hypertension increased with the advancing age (Graphs III-V). 12.8% of population had family history of hypertension and 10.6% had co-morbid diabetes (Table I). On correlating age with family history of hypertension and diabetes there was no significant correlation (Table-II).

Weight gain is recognized to be an important contributor to hypertension. Body mass index (kg/m^2) is the measure of relative weight. Association between body mass index (BMI) and blood pressure (BP) have been consistently observed, but remain poorly understood. The two important mechanisms for such an association is altered renal function and insulin resistance. Insulin resistance and hyperinsulinemia causes activation of the sympathetic nervous and renin-angiotensin systems, and physical changes within the kidney itself. There is increase renal plasma flow, glomerular filtration rate and tubular reabsorption compared with normal. [51]

It is also observed that persons with higher BMI values consume more sodium, and engage in less physical activity. [52-54] To make matters more complex, changes in body composition and fat distribution are not linear with BMI and vary by gender. A study by using bioelectric impedance analysis demonstrated a curvilinear relationship between BMI and percent body fat. [55] Women have twice the percent body fat at a given BMI than men and appear to regulate related hormones, like leptin, at a different level. [56] Study by Jay et al demonstrated that men at least BMI values <21 kg/m^2 linearly related to blood pressure. [51]

Present study concords with the above study findings. Male population (Graphs VI) shows linear increase in mean systolic blood pressure with BMI 18.5 to 25 after that there is exponential growth with increase in BMI, whereas diastolic blood pressure showed marginal increase with BMI. Female population (Graph VII) show linear increase in mean Systolic blood pressure with BMI from 18.5 till 34.9 and subsequently showed exponential growth.

In nutshell it appears that fishermen population show lower prevalence for hypertension. One can attribute the same to physical exercise and dietary patterns of the population. Logistically though nearer to city, but life pattern resembles rural population. They reside in isolation and all of them belonged to lower socio-economic group. They have strong cultural and communal support systems in which individuals have clear responsibilities towards the community. They are engaged in heavy physical activities like deep sea fishing and subsidiary activities like fish drying, fish selling etc.

Among diet they consumed parboiled rice, vegetables and fish being the staple food. Their average fish consumption per day ranged from 200 to 300 Gm/day.

One of the factors that contribute to hypertension is food habits. National Heart, Lung, and Blood Institute (part of the NIH, a United States government organization) recommends DASH diet (Dietary approaches to Stop Hypertension) for hypertensive and pre-hypertensive conditions. It is a high fiber, low to moderate fat diet, and is rich in potassium, calcium, and magnesium. The diet plan includes: Grains and grain products (include at least 3 whole grain foods each day),

Fruits, Vegetables, Low fat or non fat dairy foods, Lean meats, fish, poultry, Nuts, seeds, and legumes. [44-47] The population in study consume fish as a staple food which forms part of DASH diet, this could be one of the factors for low prevalence of hypertension. Prior in his study reported low prevalence of hypertension in an ethnic population which share similar characteristics of present study. [12]

We found a striking lack of awareness of elevated blood pressure among hypertensive participants in present study; only 40.4 % aware of their condition and lower portion i.e. 4.3% of them treated had irregular compliance. These figures are substantially lower than corresponding figures from developed countries, but they are comparable to data from other developing countries. [57-62] Interpretation of data on awareness, treatment and control of hypertension is complex in developing countries because it reflects intricate interplay between availability, accessibility and affordability of physician services and pharmacological medication. Education socioeconomic status of patient, awareness of guidelines among practitioners and individual physicians' thresholds for treatment of high blood pressure also effect on control of hypertension. Of this multiple factors, it is noteworthy though Bengre is near to Mangalore; there is easy availability and accessibility of medical care. Our

findings of low awareness of hypertension could be because of low education, poor socio-economic condition and traditionally practices of treatment for symptoms of hypertension. There is also no gender difference in awareness of hypertension.

CONCLUSION

On examining the fishermen population one could infer that low prevalence rate of hypertension may be because of Physical activities and dietary patterns. Advancing age and female gender were risk factors. Family history of hypertension and diabetes did not show any correlation with hypertension. BMI above 25 in men and 35 in women showed increased risk for systolic hypertension. Only 40 % of affected population was aware of hypertension. No gender difference was found in awareness. Low education, poor socioeconomic condition and traditionally practices of treatment for symptoms of hypertension were reason for low awareness. Considering the above facts there is need to conduct large multicentre prospective epidemiological studies with a focus on ethnicity and food habits .There is increased need to generate adequate quality awareness programmes focusing on signs/symptoms, risk factors, complications and importance of adherence to treatment of hypertension at various levels of medical services.

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