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TO ASSESS THE INCIDENCE AND AWARENESS OF HYPERTENSION IN CATCHMENT AREA OF TERTIARY HEALTH CARE FACILITY LOCATED IN RAIGAD DISTRICT IN RELATION TO NUTRITIONAL CHANGES

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Abstract

Background: Hypertension is a major public health problem and important area of research due to its high prevalence and being major risk factor for cardiovascular diseases and other complications. **Objectives:** (1) To assess the prevalence of hypertension and its relation to the nutritional changes in the population and (2) to estimate awareness. **Methods and Materials:** A community based interventional study was conducted among the population of Raigad district. A sample size of 310 was done. Patient who are not diagnosed for hypertension are only included in the study **Results:** The prevalence of hypertension was 38.4% (male: 48.3%, female: 29.9%). Higher odds of being hypertensive were found in male subjects, who had family history of hypertension,subjects of upper socioeconomic status, did not take regular excercise. Tobacco and alcohol consumption, users of oral contraceptive pills. **Conclusion:** 38.4% of the participants were hypertensive and the associated nutritional changes show that positive co -relation with hypertension.

Introduction

Hypertension is attributable to 10.8% of all deaths in India[1], the overall prevalence of hypertension in Maharashtra was around 25%[2].The *Global brief on hypertension authored by WHO* published on the occasion of World Health Day 2013, writes nearly 80% of deaths due to cardiovascular disease occur in low- and middle- income countries Early detection and treatment of hypertension and other risk factors, as well as public health policies that reduce exposure to behavioural risk factors, have contributed to the gradual decline in mortality due to heart disease and stroke in high-income countries over the last three decades. For example, in 1972, preventive interventions were initiated in a community project in North Karelia, in Finland. At that time Finland had an extremely high mortality rate from heart disease. Within five years, many positive changes were already observed in the form of dietary changes, improved hypertension control, and smoking reduction. Accordingly a decision was made to expand the interventions nationally. Now, some 35 years later, the annual cardiovascular disease mortality rate among the working- age population in Finland is 85% lower compared to the rates in

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1977[3].

Premature death, disability, loss of income, and healthcare expenditure due to hypertension, take a toll on families, communities and national finances. Households often then spend a substantial share of their income on hospitalization and care following complications of hypertension, including heart attack, stroke and kidney failure. Families face catastrophic health expenditure and spending on health care, which is often long term in the case of hypertension complications, pushing tens of millions of people into poverty. Moreover, the loss of family income from death or disability can be devastating [3].

"Not addressing hypertension in a timely fashion will have significant economic and social impact."[3]

Review of Literature

Hypertension is an" iceberg" disease. It became evident in 1970 that only half of the hypertensive subjects in the general population of most developed countries were aware of the condition, only of about half of those aware of the problem were being treated, and only about half those treated were considered adequately treated.

This rule holds true till date which is proved by studies conducted recently, such as, Existence of rule of halves in hypertension: An exploratory analysis in an Indian village, By Nafis Faizi (MD, MPH). Assistant Professor in Community Medicine, J N Medical College, Aligarh Muslim University (AMU), India [5]. The result of the study states, "the present study in residents more than 40 years of age in the Mirzapur village in Aligarh found that the prevalence of hypertension in the study population was 41.9%, with a higher prevalence in older age groups. The mean blood pressure of the study population was found to be 100.03±13.17 mm Hg. The high prevalence reported in the present study reflects and reaffirms the increasing trend of hypertension in not only the urban, but also rural India, at least in the older age group. The problem of hypertension, due to its silent and asymptomatic nature, frequently depicts a rule of halves in places with weaker health system and an equally weaker health awareness and information among populations and the same is true for this village."[5]

Aim:

- To assess incidence and awareness of hypertension

Objective:

- To assess the demographic profile of subjects.
- To assess the knowledge among subjects about behavioural risk factor leading to hypertension
- To refer to the tertiary health care centre for further evaluation, if found hypertensive

Material and Method

Type of Study: Community Based study

Study of design: Interventional study

Study Period: April-May 2019

Study Area: The study was conducted in the catchment area of tertiary health care centre located in the Raigadh district.

Study population:

- Target Population- All the young adults above age of 35 years in the catchment area of the tertiary health care facility

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Sample size
Estimation of prevalence / proportion:
Prevalence of hypertension population P= 24%
Therefore, Q= 100-24=76%
Confidence interval of study = 95%
Therefore, Z=1.96
Therefore, level of significance, L= 5%
Therefore, Formula for sample size estimation is

$$N=\frac{Z^2PQ}{l^2}$$

$$=\frac{(1.96)^2\times(25)\times(75)}{(5)\times(5)}$$

N = 285.1

Therefore, Total sample need to study =N+(N $\times$10%)
=285 + 28.5≅ 310

Selection criteria

- **Inclusion Criteria**- Subjects who are willing to participate. Non migrant and permanent resident of Raigadh district. Patient who are not diagnosed for hypertension.
- **Exclusion Criteria**- subjects who knew they were hypertensive and were receiving treatment for the same.

Any guest who is temporarily staying in the area.
Research Tools: Instrument used: Electronic Sphygmomanometer
I had taken an informed consent of the subject for taking part in the research project. I gave a preformed, pre-validated questionnaire to the subject willing to participate in the study to fill his/her information

Methodology
I started my research project after getting an approval from Institutional
Ethics Committee. The questionnaire contained following information of the subject:
Name, Age, Sex, Family history of hypertension, Religion, Smoking, Alcohol, Heart Rate, Physical activity, Socioeconomic Status, Oral contraceptive pills, if women[6] etc..
I checked the blood pressure of patient on the left brachial artery by the help of electronic sphygmomanometer and if I found that the patient was hypertensive then I waited for 10-15 minutes, let the subject relax completely and again checked the blood pressure, if the patient is still hypertensive then I noted down his Blood pressure, if not so then my first reading of blood pressure was just a random high blood pressure and the subject was not suffering from hypertension. If the patient is confirmed for hypertension, then I referredhim/her to tertiary health care for further evaluation and management.

AMERICAN HEART ASSOCIATION HYPERTENSION CLASSIFICATION 2017

BP CATEGORY	**SYSTOLIC BP MMHG**		**DIASTOLIC BP MMHG**
Normal	>120	And	<80
Elevated	120-129	And	<80
Hypertension			
Stage 1	130-139	Or	80-99
Stage 2	≥140	Or	≤90

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Hypertensive Crisis	>180	And/or	>120

Quality control

- Only electronic sphygmomanometer was used to record blood pressure, to rule out personal error.
- I used the same electronic sphygmomanometer on every subject, to rule out instrument error.
- The blood pressure was taken on left brachial artery of every subject only, to rule out variation in reading due to variation blood pressure on various anatomical site.

Confidentiality

- Strict confidentiality was maintained on the identity of the subjects taking part in the research and it was not to be disclosed to anyone not related to the research.

Statistical Analysis Plan

1. Data was collected by standard method and stored in MS-Excel for compilation and validation
2. Basic Descriptive statistics and graphs was analysed by MS-Excel
3. Vital statistics like Percentage, Prevalence, Mean, Median, Mode was use to summarize each variable.
4. Chi-square test, P- value was also used to assess the study

Results and Discussion

Table no. 1: Age and sex distribution of the study

Age	Total Male	Total Female	Hypertensive Male	Hypertensive Female	Hypertensive Male	Hypertensive Female	P-value	Result
35-45	56	62	21	30	37.5%	48.4%	< .00001	significant
46-55	12	56	6	11	50.0%	19.6%	< .00001	significant
56-65	68	31	42	9	61.8%	29.0%	< .00001	significant
66-75	7	12	0	0	0.0%	0.0%	NaN	NaN
76-85	0	6	0	0	0.0%	0.0%	NaN	NaN

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167 participants are female and 143 participants are male, 119 participants were suffering from hypertension, hence 38.4 % were hypertensive
167 participants are female and 50 suffer from hypertension,29.9% of the female participants were suffering from hypertension
143 participants are male and 69 suffer from hypertension, 48.3 % of the male participants were suffering from hypertension.

In the age group 35-45, 46-55, 56-65, the P- value is <0.00001 hence the result are significant, while for the age group 66-75, 76-85 no participants are hypertensive hence the result is not applicable here.
According to the study, Hypertension and aging done by Thomas W. Budford shows positive co- relation between age and hypertension.[6]
According to the study, Sex differences in the risk profile of hypertension: a cross-sectional study, Saswata Ghosh, SimantiniMukhopadhyay, and AnamitraBarik shows that prevalence of hypertension for females in this study is lower than males at a younger age but exceeds males when older.[7]

Table no.2: Co-relation between Family history and Hypertension

Family History of Hypertension	**No. of Hypertensive Participants**
Present	76
Absent	43

76 hypertensive participants have a family history of hypertension and 43 hypertensive participants have no family history of hypertension.

It is seen that there is positive co relation between hypertension and family history. 74 hypertensive participants have a family history of hypertension and 43 hypertensive participants have no family history of hypertension.
In the study, Co-Relation of Family History of Hypertension with Hypertension in the Young Male Adults in Western Rajasthan done by Priya Jangid, Khemlata Tilwani, Madhurima Maheshwari, MukeshNagal, N.D. Soni, the result showed 9.25% were hypertensive and among thesefamily history of hypertension was present in 27.75% subjects.[8]

Table no.3: Co-relation between salt intake and hypertension

No. of teaspoon of salt intake	**No. of people taking the respective amount of salt**	**Number of people suffering from hypertension**
5	31	6
6	31	6
7	56	19
8	87	43
9	68	31
10	37	6

31 participants have salt intake of 5 teaspoons out of which only 6 suffer from hypertension, 19.4% of the corresponding participants are suffering from hypertension.
31 participants have salt intake of 6 teaspoons out of which only 6 suffer from hypertension, 19.4% of the corresponding participants are suffering from hypertension.
56 participants have salt intake of 7 teaspoons out of which 19 suffer from hypertension, 33.9% of the corresponding participants are suffering from hypertension.
87 participants have salt intake of 8 teaspoons out of which 43 suffer from hypertension, 49.4% of the corresponding participants are suffering from hypertension.

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68 participants have salt intake of 9 teaspoon out of which 31 suffer from hypertension, 45.6% of the corresponding participants are suffering from hypertension.
37 participants have salt intake of 10 teaspoon out of which 6 suffer from hypertension, 16.2% of the corresponding participants are suffering from hypertension.

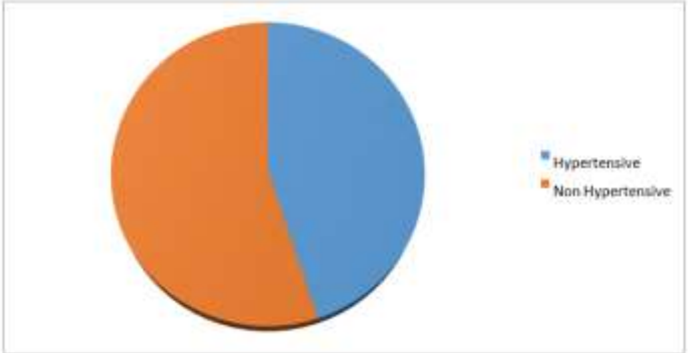
Participant taking 5 and 6 teaspoon of salt are at lowest risk of suffering from hypertension, and those taking 8 and 9 teaspoons are at the highest risk of suffering from hypertension.
It is seen, In the study, Dietary Salt Intake and Hypertension in An Urban South Indian Population, done by G Radhika, RM Sathya, V Sudha, A Ganesan, V Mohan*. The result shows that, In unadjusted model, total dietary salt intake showed 1.190 [95% C.I: 1.153-1.228, p<0.0001] times higher risk for hypertension. After adjusting for confounding variables, dietary salt intake still associated with hypertension [Odds ratio (OR): 1.161, 95% C.I:1.115-1.209, p<0.0001]. In the unadjusted model, salt added at Table > 1 teaspoon/day showed two fold higher risk for hypertension [odds ratio [OR]: 2.059, 95% Confidence Interval [CI]: 1.488-2.849, p<0.0001] compared to zero added salt taken as reference. Even after adjusting for known risk factors (model 2) such as age, sex, and body mass index, the association between added salt intake (tsp/d) and hypertension remained significant [OR: 1.759, 95% C.I: 1.240-2.495, p=0.002]. Further adjustment for dietary variables such as total energy and dietary fat also did not substantially change this association [OR: 1.698, 95% C.I: 1.176-2.452, p=0.005].[9]

Table no. 4: Co relation between type of oil used for cooking and hypertension

Type of oil used	**Hypertensive**	**Non Hypertensive**	**Chi-square**	**p-value**	Result
Ghee	45	43	35.3193	0.00001	significant
Dalda	25	61			
Mustard oil	6	50			
Refined soya bean oil	43	37			

45 out of the 88 participants eating ghee are suffering from hypertension, 51.13% of the ghee eating participants were found to be hypertensive.
25 out of the 86 participants eating dalda are suffering from hypertension, 29.1% of the dalda eating participants were found to be hypertensive.
6 out of the 56 participants eating mustard oil are suffering from hypertension, 10.7% of the mustard oil eating participants were found to be hypertensive.
43 out of the 80 participants eating soya bean oil are suffering from hypertension,53.7% of the soya bean oil eating were found to be hypertensive.
The chi-square value of the above data is 35.193 and p- value is found to be 0.00001, hence the result is significant.

Participants using refined soya bean oil and ghee are at higher chances of suffering from hypertension than ones eating dalda and mustard oil. It is seen in the study, Selecting healthy edible oil in the Indian context done by S.C. Manchanda and Santosh Jain Passi concludes that it is advisable to avoid refined oils, since during the refining process, oils are heated to high temperatures resulting in their degradation and generation of toxic substances. Refined oils, particularly high in PUFAs, degrade easily and therefore, should be avoided for frying. On the contrary, oils high in saturated fats (like *ghee*/coconut oil) can be used for Indian cooking, as they are comparatively stable during frying. Earlier, oils high in SFA were considered harmful since they increase LDL-c but recent studies indicate that oils high in short/medium-chain SFA (like coconut oil) have not demonstrated adverse health effects. Mustard and rapeseed oils – due to their favourable LA/ALA ratio, low SFA, and high MUFA content along with their relative stability during cooking – can be a preferred choice, particularly mustard oil in its non refined (cold-pressed) form. In fact epidemiologic studies among Indians do suggest that mustard oil consumption can reduce the risk of CHD.[10]



Pie Chart no. 1: Proportion of overweight people suffering from hypertension

124 participants has BMI of >= 25, 56 of the 124 overweight participant were suffering from hypertension, hence 45.1% of the overweight participants are suffering from hypertension. Regional variation in the prevalence of overweight/obesity, hypertension and diabetes and their correlates among the adult rural population in India. Published online by Cambridge University Press: 12 February 2016,done by I. I. Meshram ,M. Vishnu Vardhana Rao ,V. Sudershan Rao , A. Laxmaiah and K. Polasa shows the reslt as Overweight/obese individuals (BMI≥23 kg/m^2) had 2·1 times higher risk of hypertension (2·17; CI 1·68, 2·81), and individuals with abdominal obesity had two times higher risk (OR 1·96; CI 1·61, 2·42), whereas individuals with central obesity had 1·4 times higher risk of hypertension (OR 1·35; CI 1·13, 1·62)[11]

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