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Prevailing lifestyle risk factors and its association with complications among hypertensives in a rural area of Kancheepuram district in Tamil Nadu

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ABSTRACT

Background: Hypertension is one of the more common non communicable diseases worldwide. There is the need for life style modifications along with the treatment for managing these diseases. But some people may continue with the lifestyle risk factors even after the occurrence of the disease, leading to complications in future. The study was planned with the objectives of identifying the prevailing lifestyle risk factors and association with blood pressure control and identifying the association between the lifestyle risk factors and complications of hypertensive patients in the study area.

Methods: This is a descriptive cross sectional study done in the rural field practice area of a Medical College. Using purposive sampling technique, 300 hypertensive patients attending the rural health training centre were selected as study participant. Data collection was done by structured questionnaire. Data analysis was done using SPSS 17.

Results: Among the study group, males were 54% and females were 46%. The most common life style risk factors was sedentary type physical activity (50.7%), 27% of them added extra salt to their diet, 47.7% of them were current drinkers and 31.7% of them were current smokers. About 53% had controlled hypertension and 47% had uncontrolled hypertension. Physical activity and smoking have statistically significant association with blood pressure control. All the four risk factors like sedentary lifestyle, adding extra salt, drinking and smoking had statistically significant association with complications.

Conclusions: Hypertensive patients who tend to continue the lifestyle risk factors are more prone to develop uncontrolled blood pressure which in turn leads to further complications. Thus proper health education, and awareness creation programmes needs to be done for lifestyle modification, as part of intervention.

Keywords: Blood pressure, Smoking, Physical activity, Alcohol, Diet

INTRODUCTION

A healthy lifestyle is a way of living which lowers the risk of being seriously ill. Not all diseases are preventable, but a large proportion of deaths, particularly those from non-communicable diseases like coronary heart disease and lung cancer, can be avoided. Most of these Non Communicable Diseases (NCD) are due to certain lifestyle risk factors like tobacco use, alcohol

intake, lack of proper physical activity, lack of proper diet, etc. Tobacco accounts for 7.2 million deaths each year. 4.1 million deaths are due to excessive salt intake, 3.3 million deaths are attributable to alcohol intake and due to insufficient physical activity there were 1.6 million deaths.²

According to WHO, non-communicable diseases kill 40 million people each year which is equivalent to 70% of

the deaths worldwide. Cardio vascular diseases lead to 17.7 million deaths annually, which is followed by cancers that leads to 8.8 million deaths, followed by respiratory diseases which lead to 3.9 million deaths and diabetes that leads to 1.6 million people. These four diseases accounts for 81% of all NCD deaths. NCD or lifestyle diseases are increasing in trend in the present decade. It is becoming more prevalent in low and middle income countries. These diseases commonly affect the middle and old age individuals after prolonged exposure to an unhealthy lifestyle due to urbanization.

Hypertension is a major contributing risk factor for several cardiovascular diseases. Hypertension is elevated blood pressure with systolic blood pressure of 140 mmHg or higher and/ or diastolic blood pressure of 90 mmHg or higher.⁵ Normal adult blood pressure is defined as a systolic pressure less than 120 mm Hg and a diastolic pressure less than 80 mm Hg. Higher blood pressures are considered to indicate pre-hypertension and hypertension, which is also divided into stages, based on JNC-7 criteria (Table 1).⁶

Table 1: Classification of blood pressure for adults based on JNC 7 recommendations.

Blood pressure classification	SBP mm Hg	DBP mm Hg
Normal	<120	And <80
Pre hypertension	120-139	Or 80-89
Stage 1 hypertension	140-159	Or 90-99
Stage 2 hypertension	≥160	Or ≥100

When the blood pressure is not brought under control this may lead to stroke, cardiovascular diseases, renal failure, hypertensive retinopathy, etc. The main causes of uncontrolled blood pressure are non-adherence to prescribed medicines, excessive salt intake, alcohol intake, etc.⁷

Due to sustained elevation of the blood pressure, complications occur. The main complications of hypertension are cardio vascular disease like myocardial infarction, congestive heart failure and left ventricular hypertrophy. The retinal circulation undergoes certain pathological changes due to elevated blood pressure leading to hypertensive retinopathy. Due to progressive vascular damage kidney gets affected leading to hypertensive nephropathy i.e., chronic kidney disease. Cerebro vascular disease like stroke is also common among uncontrolled blood pressure patients.⁵

For the management of hypertension, physicians will recommend lifestyle interventions along with medications. But some patients continue with the lifestyle factors which lead to poor control of blood pressure which indeed worsens the disease leading to complications and finally resulting in premature mortalities.

Based on this background, this study was planned with the main objective of

- 1. Identifying the prevailing lifestyle risk factors among hypertensive patients,
- 2. Identifying the association between blood pressure control and prevailing lifestyle factors,
- 3. Identifying the association between the prevailing lifestyle risk factors and the complications of hypertensive patients.

METHODS

Study design

This is a descriptive cross sectional study carried out in Padappai, a rural area of Kancheepuram district of Tamil Nadu.

Study area and population

The study area for identifying the prevailing lifestyle risk factors among hypertensive patients is the catchment area of rural health training centre attached to the medical college, comprising a total population of 21,150. The study population was diagnosed patients of hypertension attending the rural health training centre for management.

Study period

This study was done for a period of 6 months, from December 2016 to May 2017.

Sample size and sampling technique

The sample size is calculated based on the prevalence of the risk factors identified in a study done by Kumbla et al in India which showed that 57.4% of the study population were having sedentary life style as one of the risk factors. Using the formula 4pq/d², with the allowable error 6% the sample size was calculated as 271. Adding 10% refusal rate the sample size obtained was 298, which was rounded off to 300. Purposive sampling method was used to carry out the study among Hypertensive patients attending the RHTC based on the following inclusion and exclusion criteria.

Inclusion and exclusion criteria

The inclusion criteria for the study were previously diagnosed case of hypertension for a minimum period of 6 months and on regular treatment. The exclusion criteria was, patients who were newly diagnosed as hypertensive, patients who were not on regular treatment and patients who refused to participate in the study.

Informed consent

Written Informed consent was obtained from the study participants before data collection, after explaining about the objectives of the study.

Data collection

Structured questionnaire was used for data collection. Demographic information including age, gender, occupation, education and socio economic status were collected. In addition to that lifestyle risk factors like physical activity, diet, smoking and alcohol were collected and complications of hypertension such as cardiac failure, myocardial infarction, stroke, hypertensive retinopathy, kidney failure were also collected. A standardised Mercury sphygmomanometer was used to record blood pressure, from the right arm of the participant. As a single reading cannot reflect the blood pressure control, a blood pressure reading taken before 3 months and a reading taken before 6 months are taken into consideration. Average of these 3 readings was calculated.9

Operational definition

Controlled hypertension: An average Systolic Blood Pressure <140 mmHg or an average Diastolic Blood Pressure <90 mmHg, among those with hypertension.

Uncontrolled hypertension: An average Systolic Blood Pressure ≥140 mmHg or an average Diastolic Blood Pressure ≥90 mmHg, among those with hypertension. ¹⁰

Physically active: >30 minutes of moderate-to vigorous activity for 5 days in a week. 11

Adding extra salt: Adding more than 5g of salt per day to the diet. 12

Current smokers: An adult who has smoked 100 cigarettes in his or her lifetime and who currently smokes cigarettes.¹³

Current drinkers: Persons who had an alcoholic drink in the last 12 months. 14

Ethical approval

Obtained from the institutional ethical committee of Sree Balaji Medical College and Hospitals.

Statistical analysis

Data were collected and analysed using SPSS software version 17. Results were presented using descriptive and Analytical statistics, Chi square and p value were calculated to find out the association and odds ratio is used to find out the strength of association.

RESULTS

This study was conducted among 300 diagnosed cases of hypertensive patients for identifying the prevailing lifestyle risk factors and its association with blood pressure control and hypertensive complications. The findings are as follows:

Table 2: Socio demographic details of the study participants.

S. No	Socio demographic details	Frequency (n=300)	Percentage (%)					
	Age group (years)							
1.	30-44	92	30.7					
1.	45-59	128	42.7					
	60 Above	80`	26.6					
	Gender							
2.	Male	162	54					
	Female	138	46					
	Education							
	Illiterate	72	24					
3.	Primary school	79	26.3					
Э.	Intermediate	51	17					
	High school	69	23					
	Above	29	9.7					
	Occupation							
4.	Unemployed	106	35.3					
4.	Employed	162	54					
	Retired	32	10.7					
	Socioeconomic s	tatus						
	Class I	31	10.3					
_	Class II	55	18.3					
5	Class III	68	22.6					
	Class IV	86	28.6					
	Class V	60	20					

Table 2 Represents the socio demographic characteristics among the study participants. Majority of the study group (42.7%) belonged to 45-60 years of age group. Of them 52% were male. Most of them had up to primary school level of education (26.3%). Majority of them were employed (54%). According to Modified BG Prasad scale the participants were divided into five classes among that most of them belong to class IV (28.6%) followed by class III (22.6%).

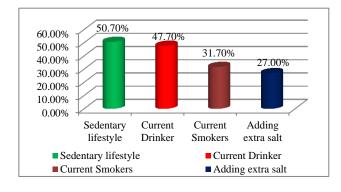


Figure 1: Lifestyle risk factors prevailing among the hypertensive patients.

Figure 1 represents the prevailing risk factors followed by the hypertensive patients in this study. Most common life style risk factors was sedentary type physical activity (50.7%), 27% of them added extra salt to their diet, 47.7% of them were current drinkers and 31.7% of them were current smokers.

Figure 2 represents the percentage of the patients who had controlled and uncontrolled blood pressure among the hypertensives. Among which 53% had controlled hypertension and 47% had uncontrolled hypertension.

Table 3: Association between blood pressure control and prevailing risk factors.

S. No		Blood pressure		Odds		Chi	Р
	Lifestyle factors	Uncontrolled (n=141)	Controlled (n=159)	ratio	95% CI	square	value
	Lifestyle						
1.	Sedentary	82 (58.16)	70 (44)	1.77	1.12-2.79	5.97	0.015*
	Physically active	59 (41.8)	89 (55.97)	1.//	1.12-2.19	3.91	0.013
2.	Diet						
	Adding extra salt	45 (31.9)	36 (22.6)				
	Normal/salt restricted diet	96 (68.1)	123 (77.4)	1.6	0.96-2.68	3.26	0.07
	Smoking						
3.	Current smoker	61 (43.3)	34 (21.4)	- 2.8	1.69-4.64	16.53	0.00*
	Non smoker	80 (56.7)	125 (78.6)	2.0			0.00
	Alcohol						
4.	Current drinker	73 (51.8)	70 (44)	1.36	0.87-2.15	1.79	0.17
	Non drinker	68 (48.2)	89 (55.97)	1.50			0.17

^{*}Statistically significant at 95% CI.

Table 4: Association between blood pressure control and complications.

	Complication	ıs				
Blood pressure	Yes	No			Chi square	P value
	(n=178)	(n=122)				
Uncontrolled	109 (61.2)	32 (26.2)	4.44	2.69-7.35	35.6	0.00*
Controlled	69 (38.8)	90 (73.8)	4.44			

^{*}Statistically significant at 95% CI.

Table 5: Association between prevailing risk factors and complications of hypertension.

S No	Lifestyle factors	Complications		Odds	95% CI	Chi	Dyalua
S. No		Yes (n=178)	No (n=122)	ratio	95% CI	square	P value
1	Lifestyle						
1.	Sedentary	99 (55.6)	53 (43.4)	1.63	1.03-2.6	4.298	0.038*
	Physically active	79 (48.3)	69 (56.6)	1.03	1.03-2.0	4.290	0.036
	Diet						
2.	Adding extra salt	64 (35.9)	17 (13.9)	3.47	1.91-6.3	17.8	0.00*
	Normal/salt restricted diet	114 (64)	105 (86)	3.47			
	Smoking						
3.	Current smoker	69 (34.8)	26 (21.3)	- 2.34	1.38-3.96	10.19	0.001*
	Non smoker	109 (65.1)	96 (78.7)	2.34			
	Alcohol						
4.	Current drinker	95 (53.3)	48 (39.3)	1.76	1.11-2.82	5.709	0.016*
	Non drinker	83 (46.6)	74 (60.7)	1.70			

^{*}Statistically significant at 95% CI.

Table 3, association between lifestyle risk factors and blood pressure control is evaluated in this table. Uncontrolled blood pressure was seen among 141 participants and controlled blood pressure was seen among 159 participants. In case of physical activity, person who followed a sedentary lifestyle was more prone to have uncontrolled hypertension (58.16%) when compared to participants who does not follow sedentary lifestyle (41.8%), which was statistically significant

(p<0.05) with an odds ratio 1.77 (95% CI - 1.12-2.79). Participants who were current smokers are more prone to have uncontrolled blood pressure (43.3%) when compared to non-smokers who have controlled blood pressure (78.6%) which has statistically significant association (p<0.05), with an odds ratio 2.8 (95% CI 1.69-4.64). Other risk factors were not statistically significant.

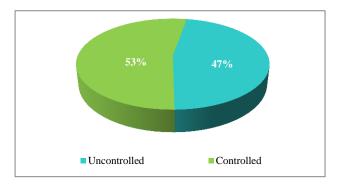


Figure 2: Percentage of uncontrolled and controlled blood pressure among study participants.

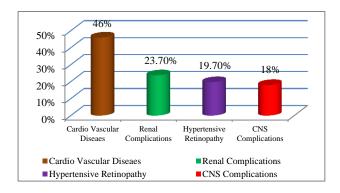


Figure 3: Percentage of hypertensive complications present among study participants.

Figure 3 shows the percentage of hypertensive complications among the study participants. Majority of the participants had heart complications (46%) followed by kidney complications (23.7%) followed by Hypertensive Retinopathy (19.7%) and CNS complications (18%).

Table 4 shows the association between the blood pressure control and the development of complications. The persons with uncontrolled blood pressure were more prone to develop complications (61.2%) when compared to persons with controlled blood pressure (38.8%), with an odds ratio of 4.44 (95% CI- 2.69-7.35) i.e., hypertensives who had prolonged uncontrolled blood pressure were 4.44 times more prone to develop Hypertensive complications when compared to the persons who had a controlled blood pressure which was statistically significant (p<0.05).

Table 5, association between the prevailing life style factors and development of complications were evaluated

in this study. Participants who follow sedentary type of activity are more prone to develop complications (55.6%) than participants who were physically active (48.3%), which was statistically significant (p<0.05) with an odds ratio of 1.63 (95% CI 1.03-2.6). In case of diet, participants who added extra salt to the diet were more prone to develop complications (35.9%) which was statistically significant (p<0.05) with an odds ratio of 3.47 (95% CI 1.91-6.3). Current smokers were more prone to develop complications (34.8%) while nonsmokers does not develop complications which was statistically significant (p<0.001) with an odds ratio of 2.34 (95% CI 1.38-3.96) and also. Current drinkers are more prone to develop complications (53.3%) when compared to non-drinkers (46.6%) which was statistically significant (p<0.05) and with an odds ratio of 1.76 (95% CI 1.11-2.82).

DISCUSSION

This study, done among 300 hypertensive patients to identify the risk factors and its association with complications, showed varied and interesting findings, which are discussed in detail.

Among the hypertensive patients, 50.7% were following sedentary lifestyle, 27% of them were adding extra salt to the diet, 31.7% were current smokers and 47.7% were current drinkers. These findings were similar to a study done by Kumbla et al, in four regions of India in which sedentary lifestyle was followed by 57.4%, adding extra salt to the food was followed by 65.9% of the patients. In a study done in Nepal by Vaidya et al among hypertensive patients, sedentary lifestyle was found among 32.1% and current tobacco users were 20.8%. This variation may be due to regional difference as this study was done in Nepal. Is Slightly varied results were observed in a study done in Pakistan by Inayat et al among hypertensive patients, in which, sedentary lifestyle was followed among 59.33% and 35.4% were smokers.

Among the hypertensive patients, in our study, 47% of them had uncontrolled blood pressure and 53% of them had controlled blood pressure. Varied results were found in studies conducted elsewhere. In a study done by Simkhada et al in Nepal, 33.34% had controlled blood pressure and 66.66% had uncontrolled blood pressure. The Similarly, in a study done by Cordero et al in Spain, 55.4% had controlled blood pressure. In a study done by Hyman et al in United States, 23% of them had controlled blood pressure. This variation may have been due to their varied nationality, ethnicity, level of knowledge and their attitude towards anti-hypertensive medications and modifiable lifestyle risk factors.

In this study, association was found between lifestyle risk factors and control of blood pressure. Among the study participants, persons who follow sedentary lifestyle (58.16%) were more prone to have uncontrolled blood pressure when compared to persons who follow

physically active lifestyle (48.3%). Similar results were observed in a study done by Alsairaf et al done in Kuwait. There was a statistically significant association found between sedentary lifestyle and uncontrolled blood pressure. Similar findings were observed in a study done by Simkhada et al in Nepal.¹⁷ In this study, patients who had salt restricted diet (31.9%) had controlled blood pressure when compared to patients who followed no salt restrictions. Similar findings were found in various other studies. 20-22 From our study, current smokers were higher among those who had uncontrolled blood pressure (43.3%), when compared with those who had controlled blood pressure (21.4%). Similar findings were observed in a study done by Prasada et al in Coimbatore.²³ Participants who currently consume alcohol (51.8%) had uncontrolled blood pressure when compared with the participants who do not consume alcohol (48.2%) in this study.

In this study population, cardio vascular diseases was found to be most common complication (46%), followed by renal complications (23.7%), hypertensive retinopathy (19.7%) and cerebro vascular diseases (18%). In a study done by Inayat et al in Pakistan similar results were observed. In this study statistically significant association was observed between the patients who have lifestyle risk factors and complications of hypertension. In a study done by Cavalcante dos Santos et al in Brazil, smokers and sedentary lifestyle are the more common risk factors which lead to development of complications. ²⁴

People living in the rural areas of our community lack the knowledge and awareness about NCD's like hypertension and its health consequences. They tend to continue with lifestyle risk factors even after occurrence of the disease, leading to complications, increasing the morbidity and mortality.

CONCLUSION

The study outcome clearly shows that patients with hypertension who continue with lifestyle risk factors like sedentary activity, adding extra salt to the diet, smoking and alcohol intake were having uncontrolled blood pressures. Prolonged uncontrolled blood pressure will lead to several complications later in life. Participants who continue the lifestyle risk factors that precipitates the development of complications shows significant association indicating that, hypertensives who follow lifestyle risk factors are more prone to develop complications. This may be due to lack of awareness among participants about the lifestyle risk factors that affects the blood pressure control which in turn worsens the prognosis of the disease leading to complications. This will have an impact on the management of hypertension and its outcome. In order to overcome these problems, certain policy interventions can be advocated,

- 1. Increasing taxes for tobacco and alcohol to reduce and prevent harmful use of these products,
- Promotions and advertisement about tobacco and alcohol must be banned and statutory warning and health information regarding the harmful effects of these products should be strictly followed,
- Public awareness programme for enhanced physical activity and balanced diet consumption must be promoted.

Healthy lifestyle modifications can be achieved by advocating diet counselling, exercise for enhanced physical activity; de-addiction for chronic use of alcohol and chronic tobacco smokers. Treating physicians can play an important role in giving proper health education to the patients, about the lifestyle risk factors and creating awareness about the complications of hypertension in order to bring about a favourable outcome for hypertension management.

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Ethical approval: The study was approved by the Institutional Ethics Committee, Sree Balaji Medical College and Hospital

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