

SMOKING, ALCOHOL AND HYPERTENSION

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ABSTRACT

Cardiovascular diseases (CVD) are important causes of global preventable morbidity and mortality in which hypertension is an important public health concern worldwide being responsible for an annual death of 7.1 million. Researchers recognize that smoking is common among drinkers and that it is a strong risk factor for heart disease that could enhance the true effect of alcohol consumption which itself can lead to the development of hypertension and other cardiovascular ailments. However, CVD presents differently in men and women and there is evidence that treatment efficacy is different between genders. *Objective:* The present study was undertaken to study the prevalence of hypertension and its associated factors viz. age, gender, smoking and alcohol among rural population of South India. *Method:* The current research was a questionnaire based study carried out in two phases with Blood Pressure measurement. *Result:* The study results showed that reasonable number of individuals were either hypertensive or in the risk of development of hypertension, in which the prevalence of hypertension was more in females with advancing age and with the exposure to risk factors i.e. alcohol and smoking. With increase in smoking there was increase in the incidence of pre-hypertension and hypertension, majority of the study population was non-alcoholic and most of the population with pre-hypertension and hypertension were in the same group, with alcoholics it was observed that the incidence of hypertension and pre-hypertension increases with the increase in the alcohol consumption. *Conclusion:* The study concluded with direct relationship between the risk factors and hypertension.

Keywords: Hypertension, Risk Factors, Rural population, Lifestyle factors, Smoking, Alcohol, Age, Gender.

INTRODUCTION

Cardiovascular diseases are important causes of global preventable morbidity and mortality and one of the leading causes of death worldwide in which hypertension is an important public health concern worldwide being responsible for an annual death of 7.1 million [1,2,3]. Hypertension a syndrome not a single disease is a silent disease, posing a major public health challenge to the population in socioeconomic and epidemiological transition, because numerous hypertensive cases are not detected due to a simple lack of routine check-up. In addition, the onset of hypertension is insidious and there is an absence of overt symptoms at its early stages until it is very severe [1,4,5,6].

The rural populations being the marginalized and vulnerable communities in India facing considerable disparity as compared to urban populations in terms of health facilities, education and economic pursuits. Non exposure to risk factors like physical inactivity and obesity might be prevalent among the rural population but exposure to risk factors like smoking and alcohol consumption are on the rise in lower socioeconomic strata [7].

All over the world the life expectation of people is increasing. Unfortunately, the rapidity of population ageing is expected to continue to outpace social and economical development in developing countries particularly in countries like India [8]. Moreover, these developments have reduced the physical activity of the people to a very large extent and increased the alcohol and tobacco use [9].

Furthermore, the prevalence of hypertension is much higher among people aged above 45 years than those under and has not been clarified whether this aging-associated phenomenon is due to an accumulative effect of environmental exposures or a naturally occurring process or the interaction of both. It is also not known whether the clinical characteristics are similar in hypertensive patients of different genders, given similar environment factors [10].

However CVD presents differently in men and women and there is evidence that treatment efficacy is different between genders; for example, compared with male patients, aspirin is more effective in female patients in preventing stroke whereas it is less effective in preventing myocardial infarction. However, it has been shown that antihypertensive treatment can be as effective in women as in men [11].

Alcoholism is a worldwide social problem, with severe effects on public health [12]. Several factors complicate the interactions between tobacco and alcohol on cardiovascular disease. The relationship between smoking and risk of cardiovascular disease is dose dependent—more tobacco leads to more disease but for alcohol consumption, the issue is more complex. Most evidence suggests that consumption in the range of 3 to 14 drinks per week is associated with lower risk of heart attack. Acutely, alcohol causes a modest fall in blood pressure but continued consumption of more than two usual portions a day results in a dose-dependent rise in blood pressure. In both experimental and observational studies of alcohol consumption and cardiovascular disease, cigarette smoking is treated as a confounder or nuisance parameter. Evidence for cardiovascular benefits of light drinking has been challenged by a recent meta-analysis i.e. researchers recognize that smoking is common among drinkers and that it is a strong risk factor for heart disease that could cloud the true effect of alcohol consumption. Moreover, cigarette smoking among alcohol drinkers may be related both to shared lifestyle habits and to direct effects of alcohol [13,14,15].

Smoking causes an immediate increase in blood pressure (both systolic and diastolic) and heart rate that persists for more than 15 minutes after one cigarette when compared to non-smokers. Although smoking is known to increase the risk of developing hypertension, there is currently no evidence that smoking cessation directly reduces blood pressure in people with hypertension. Epidemiological data show a linear relationship between alcohol consumption and hypertension prevalence [14,16].

As mentioned above, rural areas in India are in transitional phase. This increases the risk of conditions like hypertension in rural areas. Even today there is scarcity of the studies in rural areas of India [4]. With this background, present study has been undertaken to study the prevalence of hypertension, its associated factors as well as to increase the awareness on importance of lifestyle modifications among rural population of South India.

MATERIALS AND METHODS

Study Materials

- Patient questionnaire
- Patient Information Leaflets.
- Sphygmomanometer.
- Stethoscope.

Method of Data Collection

This study was conducted in four rural villages Chunchanahalli, Arni, Mavinakere and Kanchanahalli of Mandya and Tumkur District, Karnataka. Questionnaires were employed for each individual who gave their consent to participate in the study, trained study staff administered a structured questionnaire, performed Blood Pressure measurement and counselled the patients about the disease and assessed the risk factors associated with hypertension. The questionnaire used in the study was developed from other validated questionnaires and other technical publications using expert advice from a range of sources. The questionnaire was stabilized through a pilot study conducted prior. The pilot study was performed to stabilize the questionnaire as per the current research environment and to enhance the reliability and validity of the study. The questionnaire sought information on socio-demographic variables (including Age, Gender, Smoking and Alcohol), cardiovascular risk factors and current treatments. Statistical analysis was performed using MS Excel, SAS version 9.2.

RESULT

Age Wise Distribution

Table 1 shows the prevalence of Hypertension among different age groups during the study. This study found that a significant percentage of population was on the verge of developing hypertension (35.62% Pre-hypertensives), where the age group of

30-39 was mostly in risk and age group of 50-69 years were mostly affected with hypertension.

Age and Gender Wise Distribution

Table 2, 3, 4 shows the prevalence of Hypertension amongst different age groups of male and female study population, which shows that there was not much difference with respect to the prevalence of hypertension between both genders, the comparison also showed higher prevalence of risk of hypertension in males when compared to females, however, the prevalence of hypertension was seen higher in females.

Alcohol Consumption and Hypertension

Table 4, Fig. 1 shows the prevalence of Hypertension among alcoholics which showed that majority of the study population was non-alcoholic (83.68%) and most of the population under risk and the hypertensive too were in the same group.

Smoking, Age and Hypertension

Through this study, it was found that 79.53% (Table 5) of population was non-smoker where the population's smoking habits were analysed in detail with number of beedies/cigarettes smoked per day. The study results revealed that with increase in smoking there was increase in the incidence of risk (pre-hypertension) and hypertension. The comparison is clearly evident through the detailed analysis (Table 6-10)

Table 1: Age Wise Distribution among Participating Population

Age Distribution (In Percentage)							
AGE	Stage I	Stage II	Low	Normal	Pre-hypertension	Systolic Hypertension	Total
30 - 39	1.71	0.51	0.17	15.92	11.99	0.17	30.48
40 - 49	1.54	1.54	0	11.3	8.39	0.17	22.95
50 - 59	2.57	2.4	0.17	5.99	5.99	0.34	17.47
60 - 69	1.88	2.57	0	3.77	5.14	1.03	14.38
70 - 79	1.54	1.03	0	2.57	1.54	0.17	6.85
80 +	1.37	0.86	0	1.88	2.57	1.2	7.88
Total	10.62	8.9	0.34	41.44	35.62	3.08	100

Table 2: Age Distribution in Female

Age Distribution (Female) [In Percentage]							
AGE	Stage I	Stage II	Low	Normal	Pre-Hypertension	Systolic Hypertension	Total
30 - 39	1.73	0.35	0	18.34	10.38	0	30.8
40 - 49	1.73	1.73	0	12.11	5.88	0.35	21.8
50 - 59	2.08	2.42	0.35	5.54	4.84	0.35	15.57
60 - 69	2.08	3.46	0	4.84	6.23	1.04	17.65
70 - 79	2.08	1.04	0	2.77	2.08	0.35	8.3
80 +	1.04	1.04	0	1.04	1.38	1.38	5.88
Total	10.73	10.03	0.35	44.64	30.8	3.46	100

Table 3: Age Distribution in Males

Age Distribution (Male)[In Percentage]							
Age	Stage I	Stage II	Low	Normal	Pre-Hypertension	Systolic Hypertension	Total
30 - 39	1.69	0.68	0.34	13.56	13.56	0.34	30.17
40 - 49	1.36	1.36	0	10.51	10.85	0	24.07
50 - 59	3.05	2.37	0	6.44	7.12	0.34	19.32
60 - 69	1.69	1.69	0	2.71	4.07	1.02	11.19
70 - 79	1.02	1.02	0	2.37	1.02	0	5.42
80 +	1.69	0.68	0	2.71	3.73	1.02	9.83
Total	10.51	7.8	0.34	38.31	40.34	2.71	100

Table 4: Alcohol Consumption and the Prevalence of Hypertension

Alcohol Consumption (In Percentage)							
Alcohol Consumption	Stage I	Stage II	Low	Normal	Pre-Hypertension	Systolic Hypertension	Total
0	8.55	10.1	0.26	31.35	30.57	2.85	83.68
Once/wk	0.78	0.78	0.26	1.55	1.04	0	4.4
Twice/wk	0	0.26	0	2.07	1.81	0	4.15
Everyday	0.78	0	0	1.3	1.04	0	3.11
Occasional	1.55	0.26	0	0.52	2.07	0.26	4.66
Total	11.66	11.4	0.52	36.79	36.53	3.11	100

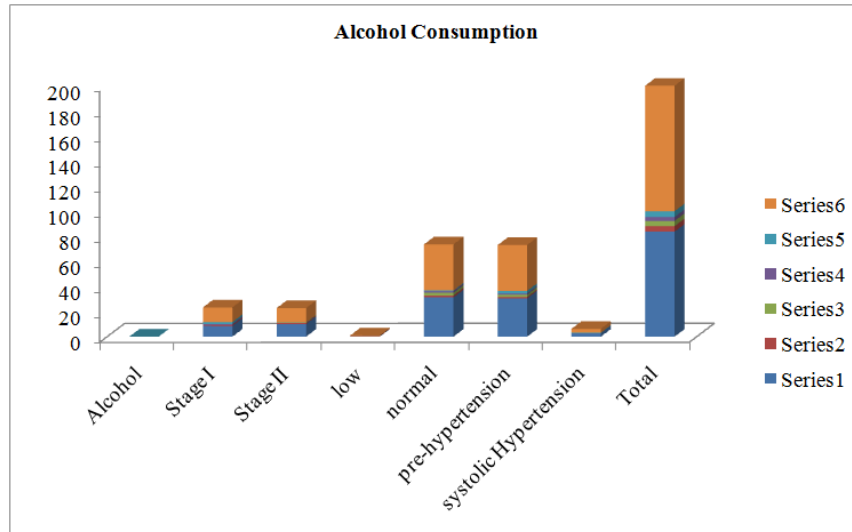


Fig. 1: Alcohol Consumption and the Prevalence of Hypertension

Table 5: Smoking, Age and Hypertension

Smoking Distribution (In Percentage)							
AGE	Stage I	Stage II	Low	Normal	Pre-Hypertension	Systolic Hypertension	Total
0	9.07	9.07	0.52	30.05	27.98	2.85	79.53
01-03/day	1.55	0.26	0	1.04	1.55	0.26	4.66
03-05/day	0	0.26	0	2.07	1.81	0	4.15
06-10/day	0	0.26	0	1.55	2.07	0	3.89
>10	1.04	1.55	0	2.07	3.11	0	7.77
Total	11.66	11.4	0.52	36.79	36.53	3.11	100

Table 6: Prevalence of Hypertension in Non-smokers

AGE and Smoking for Non-Smokers (In Percentage)							
AGE	Stage I	Stage II	Low	Normal	Pre-Hypertension	Systolic Hypertension	Total
30 - 39	2.28	0.65	0.33	16.94	12.7	0	32.9
40 - 49	2.28	1.3	0	10.1	7.17	0.33	21.17
50 - 59	1.63	2.93	0.33	4.56	4.89	0.33	14.66
60 - 69	1.95	4.23	0	2.61	4.89	1.3	14.98
70 - 79	1.3	1.3	0	2.28	1.95	0	6.84
80 +	1.95	0.98	0	1.3	3.58	1.63	9.45
TOTAL	11.4	11.4	0.65	37.79	35.18	3.58	100

Table 7: Age and Smoking (1-2 beedies/cigarettes per Day)

AGE and Smoking 1-2/ Day (In Percentage)							
Age	Stage I	Stage II	low	normal	pre-hypertension	systolic Hypertension	Total
30 - 39	5.56	0	0	16.67	22.22	0	44.44
40 - 49	5.56	0	0	5.56	5.56	0	16.67
50 - 59	11.11	0	0	0	0	0	11.11
60 - 69	5.56	0	0	0	0	5.56	11.11
70 - 79	0	5.56	0	0	0	0	5.56
80 +	5.56	0	0	0	5.56	0	11.11
Total	33.33	5.56	0	22.22	33.33	5.56	100

Table 8: Age and Smoking (3-5 beedies/cigarettes per Day)

AGE and Smoking 3-5/Day (In Percentage)							
Age	Stage I	Stage II	Low	normal	pre-hypertension	systolic Hypertension	Total
30 - 39	0	0	0	6.25	6.25	0	12.5
40 - 49	0	0	0	18.75	25	0	43.75
50 - 59	0	0	0	12.5	6.25	0	18.75
60 - 69	0	0	0	0	6.25	0	6.25
70 - 79	0	6.25	0	0	0	0	6.25
80 +	0	0	0	12.5	0	0	12.5
Total	0	6.25	0	50	43.75	0	100

Table 9: Age and Smoking (6-10 beedies/cigarettes per Day)

Age Vs Smoking 6-10/Day (In Percentage)							
Age	Stage I	Stage II	low	normal	pre-hypertension	systolic Hypertension	Total
30 - 39	0	0	0	26.67	13.33	0	40
40 - 49	0	0	0	0	6.67	0	6.67
50 - 59	0	0	0	0	6.67	0	6.67
60 - 69	0	0	0	0	6.67	0	6.67
70 - 79	0	0	0	6.67	0	0	6.67
80 +	0	6.67	0	6.67	20	0	33.33
Total	0	6.67	0	40	53.33	0	100

Table 10: Age and Smoking (≥ 10 beedies/cigarettes per Day)

AGE and Smoking ≥ 10 /Day (In Percentage)							
Age	Stage I	Stage II	Low	Normal	Pre-Hypertension	Systolic Hypertension	Total
30 - 39	0	0	0	10	6.67	0	16.67
40 - 49	0	10	0	0	0	0	10
50 - 59	6.67	10	0	10	13.33	0	40
60 - 69	3.33	0	0	3.33	13.33	0	20
70 - 79	3.33	0	0	0	6.67	0	10
80 +	0	0	0	3.33	0	0	3.33
Total	13.33	20	0	26.67	40	0	100

DISCUSSION

This study provided up-to-date information about the levels of cardiovascular risk factors and the prevalence of hypertension in rural Karnataka, from a total of 650 rural population studied during the research only 584 satisfied the inclusion criteria and were enrolled in the study. When the age distribution among the study population was evaluated it was observed that a considerable number of individuals were either hypertensives or in risk of development of hypertension in which, middle and old age females were more affected when compared to the male population. Although, the margin of difference was small in the prevalence of hypertension amongst the two genders in different age groups, it was seen from previous studies that social habits like alcohol and smoking plays vital role in the development and progression of cardiovascular diseases like hypertension [12, 17-19]. In the present study it was inferred that although majority of the population were non-alcoholic, but it represented the highest percentage of hypertensives and also those who are in verge of development of hypertension (i.e. pre-hypertension). Among alcoholics who were smokers too, the results depicted a progressive increase in the percentage of individuals with the risk of hypertension (i.e. pre-hypertension) and hypertension with increase in concomitant administration of alcohol and smoking. In other words the results clearly showed that the chances of hypertension increases with the increase in habits like smoking and alcohol consumption, moreover, it is evident from previous studies that smoking is associated with alcohol consumption also [13,14]. Taking smoking as an individual risk factor, it was clearly evident that with the increase in smoking there is an increase in the incidence and prevalence of hypertension and the risk of its development (i.e. pre-hypertension), advancing age also plays an important role along with the number of beedies/cigarettes smoked per day.

CONCLUSION

The study concluded that age and gender plays a vital role in the development of hypertension as was evident from the present study that female participants with hypertension were more vulnerable to hypertension when compared with the males, especially at advancing age. Also, this study proved a direct association between hypertension, smoking and alcohol consumption i.e. higher the number of beedies/cigarettes smoked per day more may be the chances of developing cardiovascular disorders, a similar relationship is seen between alcohol consumption and the development of hypertension and other cardiovascular disorders. The study suggest and demand's that these kind of studies will improve rural awareness about cardiovascular diseases and the risk factors associated with them, which may in turn aid in reducing the

burden of these Non-communicable Diseases and help in improving the Quality of life especially in the rural population of India.

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REFERENCES

1. Yunus AM, Sherina MS, Nor Afiah MZ, Rampal L. The Prevalence of Hypertension and Smoking in the Subdistrict of Dengkil, Selangor. *Malaysian Journal of Public Health Medicine* 2003;3(2):5-9.
2. Jeffrey S. Berger, Courtney O. Jordan, Donald Lloyd-Jones, Roger S. Blumenthal. Screening for Cardiovascular Risk in Asymptomatic Patients. *Journal of the American College of Cardiology* 2010; 55(12):1169-77.
3. Veghari G, Sedaghat M, Maghsodlo S, Banihashem S, Moharloeel P, Angizeb A et al. Impact of Literacy on the Prevalence, Awareness, Treatment and Control of Hypertension in Iran. *Journal of Cardiovascular and Thoracic Research* 2012; 4(2):37-40.
4. Kokiwar P.R, Gupta S.S and Durge P.M. Prevalence of Hypertension in a Rural Community of Central India. *JAPI* 2012; 60:26-29.
5. Amit K. Khairnar, Dheeraj T. Baviskar and Dinesh K. Jain. Angiotensin II Receptor Blockers: An Overview. *International Journal of Pharmacy and Pharmaceutical Sciences* 2012; 4(3): 50-56.
6. Amal Khalil Turki And Syed Azhar Syed Sulaiman. Elevated Blood Pressure Among Patients With Hypertension In General Hospital Of Penang, Malaysia: Does Poor Adherence Matter?. *International Journal of Pharmacy and Pharmaceutical Sciences* 2010;2(1): 24-32.
7. Mahmood SE, Srivastava A, Shrotriya VP, Shaifali I and Mishra P. Prevalence and Epidemiological Correlates of Hypertension among Labour Population. *National Journal Of Community Medicine* 2011; 2(1):43-48.
8. Ashok Kumar T, Sowmiya KR and Radhika G. Morbidity Pattern Among the Elderly People Living in a Southern Rural India - A Cross Sectional Study. *Nat.J.Res.Com.Med.* 2012; 1(1): 15-19.
9. Tiwari S, Sinha AK, Gehlot S, Gambhir IS and Mohapatra SC. Prevalence of Health Problems Among Elderly: A Study in a Rural Population of Varanasi. *Indian J. Prev. Soc. Med.* 2010; 41(3 and 4): 226-30.
10. Chen JW, Wu SY and Pan WH. Clinical characteristics of Young-onset Hypertension-implications for different genders. *International Journal of Cardiology* 2004; 96: 65- 71.

11. Vehier CM, Simon T, Meynier DG, Ferrini M, Ghannad E, Hubermann JP et al. Gender - related differences in the management of Hypertension by Cardiologists: The PARITE Study. *Archives of Cardiovascular Disease* 2012; 105: 271-280.
12. Ceccanti M, Sasso GF, Nocente R, Balducci G, Prastaro A, Ticchi C et al. Hypertension in Early Alcohol Withdrawal in Chronic Alcoholics. *Alcohol & Alcoholism* 2006; 41(1): 5-10.
13. Mukamal KJ. The Effects of Smoking and Drinking On Cardiovascular Disease and Risk Factors. *Health Risks* 2006; 29(3): 199-202.
14. Ahmed ST and Memon MA. Smoking And Its Relationship With Blood Pressure, Blood Glucose And Blood Parametes In Patients With Coronary Heart Disease. *Pak J Physiol* 2008; 4(1): 5-7.
15. Kaplan NM. Alcohol and Hypertension. *The LANCET* 1995; 345: 1588-1589.
16. Huang N, Duggan K and Harman J. Lifestyle Management of Hypertension. *Australian Prescriber* 2008; 31(6): 150-53.
17. Efstathios A. Skliros, Stavroula A. Papadodima, Alexios Sotiropoulos, Christos Xipnitos, Anastasios Kollias and Chara A. Spiliopoulou. Relationship Between Alcohol Consumption and Control of Hypertension Among Elderly Greeks. The Nemea Primary Care Study. *Hellenic J Cardiol* 2012; 53: 26-32.
18. Ian B Puddey and Lawrence J Beilin. Alcohol Is Bad For Blood Pressure. *Clinical and Experimental Pharmacology and Physiology* 2006; 33: 847-52.
19. Sumeet Gupta, Bimal K. Agrawal, Prabodh K. Sehajpal and Rajesh K. Goel. Prevalence and Predictors of Essential Hypertension in the Rural Population of Haryana, India: An Hospital Based Study. *Journal of Rural and Tropical Public Health* 2011; 10: 29-34.