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Risk Factors for Hypertension and its Complications – A Hospital Based Case Control Study

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Abstract

Hypertension is one of the major public health problems and it is prevalent all over the world. It is a 'silent killer' as it is asymptomatic until its effects like Stroke, Myocardial Infarction, Renal dysfunction or visual problems are observed. So, the assessment on the risk factors which contribute more to development of blood pressure and the efforts at an early stage to control them will prevent the health hazards of Hypertension. The aim of the study was to identify the risk factors for Hypertension among patients attending Medicine OPD of Sree Mookambika Institute of Medical Sciences (SMIMS). This study also evaluated the complications associated with hypertension. This hospital based case control study was conducted in the Medicine OPD of SMIMS during March 2012. 100 consecutive Known hypertensive patients aged ≥ 40 yrs were taken as cases. Another 100 age and sex matched non-hypertensive patients from the same OPD were taken as controls. Pretested questionnaire was applied to get the socio-demographic details and life style. Height, weight, BP and Hip Circumference were measured. Complications were assessed from the history and medical records. The analysis shows that family history of hypertension (OR=2.614, p-value=0.002) and Obesity (OR=1.833, p-value=0.040) are the major risk factors for hypertension. Among the complications, Coronary artery disease (OR=1.949, p-value=0.048) and Retinopathy (OR=2.111, p-value=0.015) are most commonly associated with hypertension. Diabetes, Stroke, Peripheral vascular disease, Neuropathy are also more with hypertension than controls but statistically not significant. The positive family history and Obesity are the significant risk factors for hypertension. Coronary Artery Disease and Retinopathy are the most common complications of hypertension. Health education is to be given to the patients on the risk factors for hypertension and its prevention. Prompt control of hypertension should be imparted to avoid complications.

Key words: Hypertension, risk factors, complications, Rural adult population.

Introduction

Hypertension is one of the major public health problems and it is prevalent all over the world. It occupies fourth place in the world by its prevalence. It is emerging as an important cause for morbidity and mortality in adults. It is an Iceberg disease because unknown morbidity exceeds known morbidity. Worldwide, 7.1 million deaths are due to hypertension. It is a 'silent killer' as it is asymptomatic until its effects like Stroke, Myocardial Infarction, Renal dysfunction or visual problems are observed¹. Increased hypertension is related to sedentary lifestyles, excess salt Intake, alcohol consumption, stress due to urbanization and migration. The prevalence of hypertension is more in urban than in rural areas of India. So, the assessment on the risk factors which contribute more to development of blood pressure and the efforts at an early stage to control them will prevent the health hazards of Hypertension^{2,3}.

Objectives

This study was carried out with the following objectives: 1) To identify the risk factors for Hypertension among patients attending Medicine OPD of Sree Mookambika Institute of Medical Sciences (SMIMS) and 2) To study the complications associated with hypertension.

Materials and Method

Study Design and Setting: This is a hospital based Case Control study. This was carried out in the Medicine OPD of SMIMS during the month of September 2011. Patients more than 40 years of age attending the Medicine OPD were taken into the study. 100 consecutive known hypertensive patients aged above 40 years were considered as cases. Another 100 patients without hypertension who were matched for age and sex from the same OPD were taken as controls. Patients who are chronically ill, Psychiatric patients, handicapped patients and those not willing to participate in the study were excluded.

Materials used: Pretested questionnaire was applied to these 200 subjects to get their socio-demographic details and anthropometric measures. Height was measured using Stadiometer; Weight was measured using Weighing machine, Blood Pressure measured with Sphygmomanometer, Waist and Hip Circumference taken with Measuring tape. Blood Pressure measurement was recorded in the Right Upper Arm with the patient in the sitting position. Systolic pressure was noted at the level of appearance of sounds (first korotkoff sound) and Diastolic pressure at the level of disappearance of sound (fifth korotkoff sound). Complications of hypertension were assessed from the history and OPD medical records. Data collected were entered in Excel Spreadsheet and analyzed using SPSS Version 16.

Results

There were totally 200 subjects in the study population, comprising of 100 cases and 100 controls. 37% of them were males and 63% were females. The mean Systolic Blood Pressure (SBP) of cases and control were 139.28 and 123.28 respectively and the mean Diastolic Blood Pressure (DBP) of cases and control were 84.18 and 75.56 respectively.

Table: 1 shows some risk factors and their association with hypertension. Of those 62 patients who had family history of hypertension, 41 (66.2%) were in the cases group and 21 (33.8%) were in the control group and this difference is statistically significant [Odds Ratio 2.62 (1.40 – 4.88), p - Value 0.002]. So having family history of hypertension is 2.62 times more risk for developing hypertension as compared to those not having the history of hypertension. In the same manner, of those 74 obese (BMI > 25) patients, 44 (59.5%) were in the cases group and 30 (40.5%) were in the control group and this difference is statistically significant [Odds Ratio 1.82 (1.03 – 3.28), p - Value 0.04]. So having BMI > 25 is 2.62 times more risk for developing hypertension as compared to those not having BMI < 25. The factors like, having the history of smoking, high salt intake and Non-vegetarian diet preference are more in cases group as compared to control group. But these differences were not statistically significant.

Table: 2 shows common complications and their association with hypertension. Of those 33 who had Coronary Artery Disease (CAD), 21 (66.6%) were in the cases group and 12 (33.4%) were in the control group and this difference is statistically significant [Odds Ratio 1.95 (1.03 – 3.28), p - Value 0.048]. So CAD is 1.95 times more common in those having hypertension as compared to those not having hypertension. In the same manner, of those 64 who had Retinopathy, 40 (62.5%) were in the cases group and 24 (37.5%) were in the control group and this difference is statistically significant [Odds Ratio 2.11 (1.15 – 3.88), p - Value 0.015]. So Retinopathy is 2.11 times more common in those having hypertension as compared to those not having hypertension. Other complications like, Stroke, Peripheral vascular disease and Neuropathy are more in cases group as compared to control group. But these differences are not statistically significant.

Discussion

In this study, it is observed that having the family history of hypertension is 2.62 times more risk for developing hypertension as compared to those not having the history of hypertension. This is consistent with the study done by Ibrahim A Bani et al⁴ on the Prevalence and related risk factors of Essential Hypertension in Jazan region, Saudi Arabia. Obesity (BMI > 25) is 2.62 times more risk for developing hypertension as compared to those not having BMI < 25. This is correlating with findings of other studies^{2,5,6}.

Regarding the complications of hypertension, Coronary Artery Disease (CAD) is 1.95 times more common in those having hypertension as compared to those not having hypertension. This is consistent with studies done by Wenyu Wang et al⁷. Study on Seventh Report of JNC in prevention, detection, Evaluation and treatment of BP by US department of health and Human Services⁸ shows that, in persons >50 yrs, Systolic BP > 140mm Hg is more risk factor for CVD than Diastolic BP and the Risk of developing CVD begins at 115/75 mm Hg and it doubles with each increment of 20/10 mm Hg.

In this study, Retinopathy is 2.11 times more common in those having hypertension as compared to those not having hypertension. This consistent with other studies done by Besharati MR et al⁹ in Iran and Mohammed Zakria et al¹⁰ in Pakistan.

Conclusion

The positive family history and Obesity are the significant risk factors for hypertension. Coronary Artery Disease and Retinopathy are the most common complications of hypertension. Health education is to be given to the patients on the risk factors for hypertension and its prevention. Prompt control of hypertension should be imparted to avoid complications.

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Tables

Table.1: Risk factors for Hypertension

Factors	Category	Total	Cases (N=100)	Controls (N=100)	Odds Ratio (95% CI)	p- Value
Family History of Hypertension	Yes	62	41(66.2%)	21 (33.8%)	2.62 (1.40 – 4.88)	0.002*
	No	138	59 (42.8%)	79 (57.2%)		
Smoking	Yes	48	25 (52.1%)	23 (47.9%)	1.12 (0.55 – 2.17)	0.331
	No	152	75 (49.3%)	77 (50.7%)		
Obesity	BMI > 25	74	44 (59.5%)	30 (40.5%)	1.83 (1.03 – 3.28)	0.040*
	BMI ≤ 25	126	56 (44.4%)	70 (55.6%)		
Salt Intake	High	140	76 (54.3%)	64 (54.7%)	1.78 (0.96 – 1.92)	0.064
	Low	60	24 (40.0%)	36 (60.0%)		
Diet Preference	Non Veg.	169	87 (54.4%)	82 (45.6%)	1.47 (0.68 – 3.19)	0.329
	Vegetarian	31	13 (41.9%)	18 (58.1%)		

Table.2: Complications of Hypertension

Complications	Category	Total	Cases (N=100)	Controls (N=100)	Odds Ratio (95% CI)	p- Value
Coronary Artery Disease	Yes	33	21(66.6%)	12 (33.4%)	1.95 (1.02 – 4.28)	0.048*
	No	167	79 (47.3%)	88 (52.7%)		
Stroke	Yes	14	9 (64.3%)	5 (35.7%)	1.88 (0.61 – 5.82)	0.331
	No	186	91 (48.9%)	95 (51.1%)		
Retinopathy	Yes	64	40 (62.5%)	24 (37.5%)	2.11 (1.15 – 3.88)	0.015*
	No	146	60 (41.1%)	76 (58.9%)		
Peripheral Vascular Disease	Yes	5	4 (80.0%)	1 (20.0%)	4.13 (0.42 – 98.6)	0.174
	No	195	96 (49.2%)	99 (50.8%)		
Neuropathy	Yes	25	13 (52.0%)	12 (48.0%)	1.19 (0.47 – 2.54)	0.831
	No	175	87 (49.7%)	88 (50.3%)		