

Prevalence of hypertension among the offspring's of hypertensive patients

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Abstract:

Background: Hypertension is a major public health problem now a days and this plays a major etiologic role in the development of IHD, stroke and renal failure. Like other developing countries, prevalence of hypertension is increasing in Bangladesh.

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Ratindra Nath Mondal, Shah Md. Sarwer Jahan, Md. Mostofa Alam, Moni Rani, Anupom Das, Soma Pramanik, Md. Foyjul Islam, Md. Zakir Hossain, Beauty Saha, Amaresh Chandra Shaha, Ram B. Singh, Md. Atiqul Islam- **Prevalence of hypertension among the offspring's of hypertensive patients**

Subjects and methods: *This was a cross sectional study, carried out among the offspring's of the hypertensive patient. Hypertension and Research Center Rangpur, Bangladesh was established on 14th November, 2008. This center serves only hypertensive patients and working enormously to generate awareness of hypertension. This center follows follow up schedule of JNC-7, (in uncontrolled hypertensive patient 3-4 weekly, in controlled hypertensive patient 3-6 monthly). When any patient do not come to follow up 3 months after the scheduled follow up date, he/she is declared as drop out from follow up and telephone call is given to know the cause of drop out. By this way, this center traced 200 patients who died between November, 2008 to December, 2013. Among these 200 patients 118 victim's relative could respond for this study. All the families of these 118 victims were contacted individually to collect data from the son or daughters of the victim.*

Results: *In this study we have studied a total of 198 people of both sexes. Male were found preponderance (81.8% vs 18.2%). Mean age of the study population was 36.58 years (SD±15.52). Among the 198 population screened for hypertension, 44 had hypertension, giving the prevalence rate of 22.22% and 55.1% (109) had pre-hypertension. If we take only adult population then the prevalence of hypertension increased to 23.15%. The prevalence of hypertension was more in male (81.8 %) than female (18.21%). An upward trend in prevalence was observed with increase in age, particularly in male (18.18% in ≤29 in male and 50% in ≥70 years). In our study prevalence of hypertension were more in ex-smoker than smoker and non-smoker (26.1%, 23.2% and 21% respectively). But the prevalence of hypertension was higher in those who used to take SLT (27.8% vs 21.7%). Prevalence of hypertension was more in those who used to take added salt than who did not take added salt (30.3% vs 20.60%). Among the study population obesity (BMI ≥30 kg/M²) was found in 3.53%. Prevalence of hypertension was more in obese than others.*

Conclusion: *More than one fifth of the offspring's of the hypertensive patients developed hypertension. Regular screening is important for earlier detection of hypertension in these people and caring of the risk factors may prevent development of hypertension.*

Key words: Offspring, Rangpur, Bangladesh

INTRODUCTION

Hypertension has been reported to be responsible for 57 per cent of all stroke deaths and 24 per cent of all cardiovascular deaths in East Asians.¹ Report from Hypertension and Research Center Rangpur, Bangladesh has shown that among the hypertensive (71.2%) of the victims died due to hypertension related complications; 33.3% due to stroke, 20.3% CAD and 17.8% chronic renal failure.² The rapid economic development, industrialization and change in lifestyle seen in South Asia have led to an increasing prevalence of hypertension in this region.³ Hypertension has been widely studied in many community surveys in South Asia, though nationally representative estimates are available only in a few countries.⁴ In Bangladesh a nationwide study in 2010 revealed prevalence of hypertension 17.9%.⁵ In Rangpur division (Northern part) of Bangladesh prevalence of hypertension and pre-hypertension is 33.3% and 29.9% respectively.⁶ Family history is an important non-modifiable risk factor for hypertension. The hereditary nature of hypertension is well established by numerous family studies.⁷ Among various mechanisms proposed to explain the relation between hypertension and positive family history of hypertension, are the increased renal proximal sodium reabsorption,⁸ genetic traits related to high blood pressure such as high sodium-lithium counter-transport, low urinary kallikrein excretion, elevated uric acid level, high fasting plasma insulin concentrations, high-density LDL sub-fractions, fat pattern index, oxidative stress and body mass index, as well as shared environmental factors such as sodium intake and heavy metal exposure.⁹⁻¹² About 30 % of the blood pressure variance can be attributed to genetic factors,¹³ and was found

to vary from 25 % in pedigree studies to 65 % in twin studies.¹⁴ Studying family history of hypertension and other risk factors in healthy individuals provides a unique opportunity to explore factors leading to elevated blood pressure, long before a diagnosis of hypertension is made.¹⁵ Positive family history therefore can be considered as an opportunity for involving direct family members in health education, as well as for early interventions and improved control of hypertension.¹⁶

Therefore this study was undertaken to determine the prevalence of hypertension among the offspring's of hypertensive patients.

SUBJECTS AND METHODS:

This was a cross sectional study, carried out among the offspring's of the hypertensive patient. Hypertension and Research Center Rangpur, Bangladesh was established on 14th November, 2008. This center serves only hypertensive patients and working enormously to generate awareness of hypertension. Till date more than 12 thousand patients registered in this center. This center follows follow up schedule of JNC-7, (in uncontrolled hypertensive patient 3-4 weekly, in controlled hypertensive patient 3-6 monthly). When any patient do not come to follow up 3 months after the scheduled follow up date, he/she is declared as drop out from follow up and telephone call is given to know the cause of drop out. By this way, this center traced 200 patients who died between November, 2008 and December, 2013. Among these 200 patients 118 victim's relative could respond for this study. All the families of these 118 victims were contacted individually to collect data from the son or daughters of the victim.

DATA COLLECTION:

An informed consent was obtained before enrollment in this study. Blood pressure was measured by auscultation, using the standardized sphygmomanometer. All the participants were requested to take rest for ten minutes before measuring the blood pressure. The individual was seated in a chair with his back supported and his arms bared and supported at heart level and was refrained from the use of tobacco in any form or ingestion of caffeine during the 30 minutes preceding the measurement. Two separate readings were taken at an interval of minimum three minutes. The average of the two readings was taken. If systolic blood pressure differ >10 mm of Hg and diastolic >5 mm of Hg, then more 2 or 3 readings was taken. Systolic blood pressure measured at the appearance of the Korotkov's sounds (Phase I) and Diastolic BP was taken at the point of disappearance of the sounds (Phase V).

The socio-demographic status, waist-hip ratio, BMI, awareness of hypertension, treatment of hypertension, follow up was collected in a pre-designed, pretested proforma. The participants with history of hypertension and on hypertensive medication were also labeled as hypertensive. Recent JNC VII classification was used for classifying the hypertension.

Statistical analysis

The interested variables was processed, edited and analyzed by SPSS windows version 17.0. The sociodemographic data of the study population were expressed in frequency distribution and their observed difference was tested by one sample 't' test and 'chisquare' test. P value <0.05 was considered as statistically significant with the 95% confidence interval. The results were presented in tables.

CRITERIA

Hypertension

Systolic or diastolic blood pressure or both $\geq 140/90$ mm of Hg (according to NICE guideline). Or any individual diagnosed as hypertension and currently taking antihypertensive drugs.

Smoker

Those who currently smoke or have smoked tobacco in any form (cigarette, birri etc.) in last 6 months.

Ex-smoker

Ex-smoker who gave up smoking at least 6 months before.

Smokeless Tobacco (SLT)

SLT are raw tobacco leaves taken other than inhalation route (usually taken with betel nut or use in inner aspect of lower lip).

Obesity

BMI level $\geq 30 \text{Kg/M}^2$ (according to WHO).

Central obesity

The absolute waist circumference >102 centimeters in men and >88 centimetres in women and the waist-hip ratio >0.9 for men and >0.85 for women.

RESULTS

In this study we have studied a total of 198 people of both sexes. Male were found preponderance (81.8% vs 18.2%). Mean age of the study population was 36.58 years (SD ± 15.52). (Table I shows the socio-demographic characteristics of the study population).

Ratindra Nath Mondal, Shah Md. Sarwer Jahan, Md. Mostofa Alam, Moni Rani, Anupom Das, Soma Pramanik, Md. Foyjul Islam, Md. Zakir Hossain, Beauty Saha, Amaresh Chandra Shaha, Ram B. Singh, Md. Atiqul Islam- **Prevalence of hypertension among the offspring's of hypertensive patients**

Table I: Characteristics of the study people (n=198)		
Variables	Frequency	Percentage (%)
Age		
Mean age	36.58 years (SD ±12.21)	
Age range	13-96 years	
Sex		
Male	162	81.8%
Female	36	18.2%
Residence		
Rural	142	71.7%
Urban	56	28.3%
Level of education		
Illiterate	9	4.5%
5 or less class	11	5.6%
>5-10 class	34	17.2%
>10-12 class	72	36.4%
Graduate and above	72	36.4%
Occupation		
Service	53	26.8%
Business	37	18.7%
Agriculture	48	24.2%
Unemployed	2	1%
Housewife	25	12.6%
Others	33	16.7%

In this study 28.3% (56) people were current smoker and 11.6% (23) ex-smoker. Average duration of smoking was 5.21 pack year (range 0.30-18, SD± 4.65). Smokeless tobacco (SLT) was taken by 9.1% (18) of the study people (in the form of jorda, gul, nasha etc). Only 33.8% (67) of the study people had knowledge about hypertension and among them 77.6% (52) had knowledge about risk factors of hypertension. In this study we have found that 16.7% (33) people used to take added salt and 8.6% (17) people were physically inactive. In our study 40.4% (80) populations used to take regular exercise and 1.5% (3) people was sedentary worker.

Among the 198 population screened for hypertension, 44 had hypertension, giving the prevalence rate of 22.22% and 55.1% (109) had pre-hypertension. If we take only adult population then the prevalence of hypertension increased to 23.15%. The prevalence of hypertension was more in male (81.8

Ratindra Nath Mondal, Shah Md. Sarwer Jahan, Md. Mostofa Alam, Moni Rani, Anupom Das, Soma Pramanik, Md. Foyjul Islam, Md. Zakir Hossain, Beauty Saha, Amaresh Chandra Shaha, Ram B. Singh, Md. Atiqul Islam- **Prevalence of hypertension among the offspring's of hypertensive patients**

%%) than female (18.21%). An upward trend in prevalence was observed with increase in age, particularly in male (18.18% in ≤ 29 in male and 50% in ≥ 70 years). (Table IV).

Age group	Male			Female			Total		
	Screened	Hypertension	Prevalence	Screened	Hypertension	Prevalence	Screened	Hypertension	Prevalence
≤ 29	44	8	18.18%	15	1	6.67%	59	9	15.25%
30-39	50	6	12%	12	5	41.66%	62	11	17.74%
40-49	48	14	29.16%	2	1	50%	50	15	30%
50-59	14	5	35.71%	6	1	16.67%	20	6	30%
60-69	4	2	50%	1	0	00	5	2	40%
≥ 70	2	1	50%	0	0	00	2	1	50%
Total	162	36	22.22%	Total 36	08	5.88%	Total 98	44	22.22%

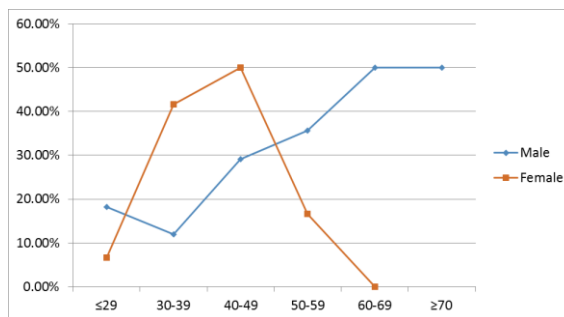


Figure: Line chart showing prevalence of hypertension in male and female.

In our study prevalence of hypertension were more in ex-smoker than smoker and non-smoker (26.1%, 23.2% and 21% respectively). But the prevalence of hypertension was higher in those who used to take SLT (27.8% vs 21.7%). Prevalence of hypertension was more in those who took added salt than who did not take added salt (30.3% vs 20.60%). Among the study population obesity (BMI ≥ 30 kg/M²) was found in 3.53%%. Prevalence of hypertension was more in obese than others (Table V).

Ratindra Nath Mondal, Shah Md. Sarwer Jahan, Md. Mostofa Alam, Moni Rani, Anupom Das, Soma Pramanik, Md. Foyjul Islam, Md. Zakir Hossain, Beauty Saha, Amaresh Chandra Shaha, Ram B. Singh, Md. Atiqul Islam- **Prevalence of hypertension among the offspring's of hypertensive patients**

Obese	57.1% (4)
Overweight	41.3% (26)
Normal weight	10.9% (14)

The blood pressure levels of the study population were classified according to JNC-7 (Table VI).

Grading of hypertension	Male	Female	Total
Grade 1	5.56% (11)	0.50% (1)	6.1% (12)
Grade 2	4.04% (8)	2.02% (4)	6.1% (12)
Systolic hypertension			
Grade 1	3.5% (7)	0	3.5% (7)
Grade 2	00	00	00
Diastolic hypertension	5.05% (10)	1.51% (3)	6.6% (13)

Grade 1, grade 2, diastolic hypertension, isolated systolic hypertension and diastolic hypertension were found more in male than female (p value 0.68). In our study both systolic hypertension and diastolic hypertension was more prevalent in < 50 years of age (85.71%76.92 respectively).

Variable	Frequency	Percentage
Age (years)		
Mean	40.36 years (SD±11.98) Minimum 19 years, Maximum 75 years	
Sex (M:F)	36 : 8	81.8%% : 18.2%
Smoking		
Current	13	29.5%
Ex-smoker	6	13.6%
SLT	5	11.4%
History of taking added salt	10	22.4%
Family history of hypertension	44	100%
Contraceptive use	1	2.3%
Sedentary lifestyle	2	4.5%

Ratindra Nath Mondal, Shah Md. Sarwer Jahan, Md. Mostofa Alam, Moni Rani, Anupom Das, Soma Pramanik, Md. Foyjul Islam, Md. Zakir Hossain, Beauty Saha, Amaresh Chandra Shaha, Ram B. Singh, Md. Atiqul Islam- **Prevalence of hypertension among the offspring's of hypertensive patients**

Obese (≥ 30 Kg/M ²)	4	9.09%
Overweight	25	56.81%
Central obesity	100	62.5%

DISCUSSION

Family history is a common non-modifiable risk factor for most chronic non-communicable diseases, as it is a collective reflection of the genetic susceptibility, shared environments and behaviors. Hence, identifying the family history will serve as a practical and useful approach for public health and preventive medicine.^{17, 18} The advantages of family history as a risk assessment tool is the low cost, greater acceptability and that it is a reflection of the shared genetic and lifestyle factors. Although family history by itself is a non-modifiable risk factor, it is useful for screening purposes¹⁹ to identify high risk population long before a diagnosis of hypertension is made,²⁰ and to target interventions and disease prevention.¹⁷ In our study prevalence of hypertension in patients with a FH was 23.15%. In a study among Srilankan adults which was 29.3%.²¹ Previous studies from different countries have shown similar increased risks^{14,19,22,23} where compared to people without a family history of hypertension, those who have a family history were 2–4 times more likely to develop hypertension.^{14,19} The risk associated with family history in the current population appeared to be independent of other known risk factors, including age, anthropometric parameters (BMI) and lifestyle factors (physical activity). The Johns Hopkins Precursors Study has identified that hypertension in both mother and father has a strong independent association with elevated BP levels and incident hypertension over the course of adult life.²⁴ Obesity is one of the important risk factor for hypertension. Friedman et al²⁵ carried out a 6-year follow-up study on hypertension and obesity; and found that obesity and

weight gain were clear precursors of hypertension. In our study, among the hypertensive 9.09% were obese, in a community based⁶ study in Rangpur division among the hypertensives 38.2% were obese.

Participants with a family history of hypertension displayed a significantly higher mean BMI, waist hip ratio and diastolic blood pressure than those without a family history, irrespective of hypertension status, a finding which is in keeping with other similar studies.^{16,17} In our study mean BMI of the hypertensive patient was 26.22 kg/m² and 23.12 kg/m² in non-hypertensive patients. Singh et al²⁶ has shown that subjects with central obesity, sedentary lifestyle and family history of hypertension have increase risk of hypertension. In our study 100% of the hypertensive had central obesity. The control of hypertension in many studies^{6, 27} range from 10% to 36.06%. But unfortunately in our study none of the hypertensive had control blood pressure. Awareness of risk is a factor that promotes better and earlier health-related behaviour²⁸ and lifestyle modifications are of proven efficacy in primary prevention of hypertension.²⁹ Hence, overall there is promising potential for the use of family history as a public health tool aiding prevention of hypertension.

CONCLUSION:

More than one fifth of the offspring's of the hypertensive patients developed hypertension. Regular screening is important for earlier detection of hypertension in these people and caring of the risk factors may prevent development of hypertension.

Limitation

Details of the drugs (types, dose) not studied.

Ratindra Nath Mondal, Shah Md. Sarwer Jahan, Md. Mostofa Alam, Moni Rani, Anupom Das, Soma Pramanik, Md. Foyjul Islam, Md. Zakir Hossain, Beauty Saha, Amaresh Chandra Shaha, Ram B. Singh, Md. Atiqul Islam- **Prevalence of hypertension among the offspring's of hypertensive patients**

Future direction

Multicentre, large sample sized community based study will require to determine the true prevalence and risk factors of hypertension among the offspring of hypertensive's.

Conflict of interest

There was no conflict of interest.

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Contributions by the authors

Dr. Ratindra Nath Mondal planned, supervised and analysed the data. Dr. Moni Rani, Md. Foyjul Islam, Dr. Amaresh Chandra Shaha helped to collect the data. Anupom Das, Md. Zakir Hossain helped in writing of the manuscript and presentation of the data.

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Ratindra Nath Mondal, Shah Md. Sarwer Jahan, Md. Mostofa Alam, Moni Rani, Anupom Das, Soma Pramanik, Md. Foyjul Islam, Md. Zakir Hossain, Beauty Saha, Amaresh Chandra Shaha, Ram B. Singh, Md. Atiqul Islam- **Prevalence of hypertension among the offspring's of hypertensive patients**

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