

Original Research Article**RISK FACTORS AND ANTHROPOMETRIC VARIABLES OF YOUNG PEOPLE WITH ESSENTIAL HYPERTENSION IN UYO, AKWA IBOM STATE.****Abstract**

Hypertension, a chronic medical condition is commonly seen in young people in my environment. Certain risk factors are associated with the development of this condition. They include having a positive family history of hypertension, being overweight /obese, excessive alcohol intake, cigarette smoking, high salt intake and others. This study was conducted to find out which of these factors have effect on hypertension on young people.

Method: One hundred and fifty one young people diagnosed with essential hypertension over a one year period January to December 2013 were recruited from patients attending the general outpatient clinic of the University of Uyo teaching hospital. Their age, sex, tribe, occupation and marital status were assessed. Risk factors like cigarette smoking, significant alcohol intake, adding salt to meals before eating, family history of hypertension and history of diabetes mellitus, weight, height, body mass index, hip circumference, waist circumference and blood pressure were assessed.

Result: A total of 151 respondents (n=151) were recruited into the study.48 respondents had stage 1 hypertension while 103 had stage 2 hypertension. More women had hypertension n=84(55.6%). Respondents with secondary level of education had more stage 1 hypertension while those respondents with tertiary education had more stage 2 hypertension. Married respondents had more of stage 2 hypertension n=56(54.4%) than stage 1 hypertension n=22(45.6%). Family history of hypertension was present in n=79(52.3%) respondents. Stage 2 hypertension was associated with having a positive family history of hypertension p=0.001. Adding extra salt to serve meals was associated with stage 1 hypertension p=0.006. Other risk factors were not significantly associated with any stage of hypertension.

Conclusion: Positive family history of hypertension and adding extra salt to serve meals were strong risk factors for hypertension in young persons in this study. So young people with positive family history of hypertension should begin early screening for detection of hypertension and reduce or refrain from adding extra salt to serve meals to reduce risk of developing hypertension.

Keyword: young people, hypertension, risk factors

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Introduction

Hypertension or high blood pressure is a chronic medical condition in which the systemic arterial blood pressure is elevated.¹ Hypertension is taken as blood pressure reading greater than or

35 equals to 140mmHg Systolic and greater than or equals to 90mmHg Diastolic.² About one billion
36 people in the world have Hypertension³ of which young people between the ages of 18 and 44
37 years constitute 6% (national health and nutrition evaluation studies 2009-2011).⁴
38 Hypertension occurs among young people in Nigeria with reported prevalence of 3.3% in South
39 East region⁵, 4.3% in Northern region⁶ and 30% in South West region.⁷

40 Certain risk factors are known to predispose people to development of essential Hypertension.
41 These factors include non modifiable factors like age (45 years and above)⁸, sex (males more
42 than females until age 65years)⁸, race (black race)⁹ and positive family history^{10,11}. Modifiable
43 factors include overweight, obesity, cigarette smoking, excessive alcohol intake, excessive salt
44 intake and others.

45 Overweight (25.0kg/m² -29.9kg/m² and obesity (BMI >30kg/m²) are known to predispose to
46 Hypertension. A study on Africans reported that 6-29% of Hypertension was attributed to
47 overweight and 1-16% was attributed to obesity.¹² Also, obesity may increase the risk of
48 hypertension five fold compared to normal weight.¹³ Cigarette which contains nicotine is known
49 to cause release of catecholamine that increase blood pressure and heart rate¹⁴. Excessive
50 alcohol intake (more than 14 units per week for women and more than 21 units per week for
51 men) causes an increase in blood pressure¹⁵; this it does by stimulating the sympathetic nervous
52 system and increasing adrenocorticoid hormone in circulation¹⁶. Excessive salt intake more than
53 6g per day¹⁷ is a known risk factor for hypertension through its effect on expansion of the
54 extracellular fluid volume, induction of cardiac myoblast and smooth muscle hypertrophy,
55 activation of NF-Kappa B in proximal tubular cells of the kidney leading to inflammation and
56 changes in the Renin Angiotensin System as well as induction of oxidative stress.¹⁸ Other
57 factors that predispose to hypertension are sedentary lifestyle, exposure to chronic stress,
58 diabetes mellitus and dyslipidaemia.

59 Since there is scarcity of study in Uyo, Akwa Ibom State, Nigeria on risk factors for essential
60 hypertension in young people, this study is undertaken to determine the risk factors and
61 anthropometric variables of young people diagnosed with essential hypertension with the aim of
62 filling the knowledge gap and bringing out which risk factors have the strongest effect on young
63 persons who develop essential hypertension.

64

65 **MATERIALS AND METHODS**

66 The study was a cross-sectional descriptive study of young people aged 18-44 years (DSMIV
67 classification of young people) with essential Hypertension attending the General Outpatient
68 Clinic of the University of Uyo Teaching Hospital.

69 A semi-structured questionnaire was administered to consenting young people diagnosed with
70 essential Hypertension. The instrument sought information on age, sex, tribe, occupation and

71 marital status. The questionnaire also sought information on risk factors like history of cigarette
72 smoking, significant alcohol intake, adding salt to meals on table before eating, exposure to
73 excessive stress on the job, in the family and finance. Other risk factors assessed were family
74 history of Hypertension, personal history of diabetes mellitus and family history of diabetes
75 mellitus.

76 Anthropometric measures - Weight, Height and Body Mass Index, Waist circumference, Hip
77 circumference and Waist Hip ratio were done for each patient. The weight was done using a
78 bathroom scale standardized to 0.1kg. Subjects stood on the weighing scale without shoes,
79 remain upright on the scale with the upper limbs to the sides of the body and the weight was read
80 to the nearest 0.1kg and recorded.

81 Height was measured with the subjects standing barefooted against an erect metric rule placed on
82 a perpendicular wall. The subjects stood erect, barefooted, heels together against the wall with
83 the buttocks and back touching the metric rule. The subjects looked straight ahead and a 30cm
84 metric rule was placed on the head of the subjects to note the height of the subject on the metric
85 rule on the wall. The subject moved away from the 30cm metric rule, the height of the subject
86 was read at the point of the head piece on the calibrated wall metric rule to nearest 0.1cm. The
87 body mass index was calculated using the formula $BMI = \text{WEIGHT (kg)} / \text{HEIGHT (m}^2\text{)}$. Waist
88 circumference was done with a measuring tape applied to waist line which is the equidistant
89 abdominal circumference between the costal margin and the iliac crest. The hip circumference
90 which is the widest circumference of the hip was done by measuring the inter-trochanteric
91 diameter of the right and left hip.

92 The blood pressure of the subject was measured using Accuson mercury sphygmomanometer
93 with cuff of appropriate size in a sitting position. Korotkoff sounds one and five were used as
94 systolic and diastolic blood pressure respectively. Two measurements were taken for each
95 subject at 5 minutes interval and the mean blood pressure was used for the analysis. Systolic
96 blood pressure of 140mmHg and above and Diastolic blood pressure of 90mmHg and above
97 were taken as Hypertension².

98 Sample population were patients attending the General Outpatients Clinic from where young
99 people diagnosed with essential Hypertension were selected. All young people diagnosed with
100 essential Hypertension over a period of one year January to December 2013 were selected as
101 respondents. Sampling method was consecutive sampling.

102 Exclusion criteria were young persons with secondary hypertension, persons with essential
103 hypertension above the age of 44 years, young persons with hypertensive heart failure or those
104 with essential hypertension who were too ill to partake in the study. Consent was received from
105 all subjects selected. Ethical approval was obtained from the Ethical Committee of the University
106 of Uyo Teaching Hospital for this study. Data analysis was done using SPSS17.0 version.

107 Results are presented as frequencies and proportions, Chi square was used while level of
 108 significance was set at 0.05.

109

110 Table 1: Socio demographic characteristics of young hypertensive patients attending general out-
 111 patient clinic in Uyo

Variable	Hypertension		Total	Statistical indices
	Stage 1	Stage 2		
Age group				$\chi^2=2.5425$ Df = 4 P value =0.637
20-24	6 (12.5)	7 (6.8)	13 (8.6)	
25-29	11 (22.9)	21 (20.9)	32 (21.2)	
30- 34	12 (25.0)	28 (27.2)	40 (26.5)	
35—39	11 (22.9)	33 (32.0)	44 (29.1)	
40-44	8 (16.7)	14 (13.6)	22 (14.6)	
Sex				$\chi^2=0.0610$ Df = 1 P value =0.805
Male	22 (45.8)	45 (43.7)	67 (44.4)	
Female	26 (54.2)	58 (56.3)	84 (55.6)	
Education				$\chi^2=4.6094$ Df = 3 P value =0.156*
No education	1 (2.1)	1 (1.0)	2 (1.3)	
Primary	4 (8.3)	11 (10.7)	15 (9.9)	
Secondary	26 (54.2)	38 (36.9)	64 (42.4)	
Tertiary	17 (35.4)	53 (51.5)	70 (46.4)	
Marital status				$\chi^2=0.9627$ Df = 2 P value =0.596*
Single	25 (52.1)	45 (43.7)	70 (46.4)	
Married	22 (45.6)	56 (54.4)	78 (51.7)	
Widowed	1 (2.1)	2 (1.9)	3 (2.0)	
Occupation				$\chi^2=5.0525$ Df = 6 P value =0.572*
Applicants	2 (4.2)	8 (7.8)	10 (6.6)	
Artisan	7 (14.6)	16 (15.5)	23 (15.2)	
Civil servants	6 (12.5)	19 (18.5)	25 (16.6)	
Students	13 (27.1)	20 (19.4)	33 (21.8)	
Trading	16 (33.3)	30 (19.4)	46 (30.5)	
Teaching	2 (4.2)	9 (8.7)	11 (7.3)	
Professional	2 (4.2)	1 (1.0)	3 (2.0)	

112

113 Table 1 shows that socio demographic characteristics of both stages of disease are similar among
 114 the respondents.*= Fishers exact.

115 Table 2: Risk factors associated with stages of hypertension among the respondents attending
 116 general out -patient clinic in Uyo.

Variable	Hypertensive	Total	Statistical indices
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	Stage 1	Stage 2		
Family history of Hypertension				$\chi^2=10.1666$ Df = 1 P value =0.001
Yes	16 (33.3)	63 (61.2)	79 (52.3)	
No	32 (66.7)	40 (38.8)	72 (47.7)	
Known DM				$\chi^2=1.6381$ Df = 1 P value =0.290*
Yes	5 (10.4)	5 (4.9)	10 (6.6)	
No	43 (89.6)	98 (95.2)	141 (93.4)	
Alcohol consumption				$\chi^2=1.6381$ Df = 1 P value =0.584*
Not significant	44 (91.7)	90 (87.4)	134 (88.7)	
Significant	4 (8.3)	13 (12.6)	17 (11.3)	
Smoking				$\chi^2=0.3314$ Df = 1 P value =1.000*
Yes	1 (2.1)	4 (3.9)	5 (3.3)	
No	47 (97.9)	99 (96.1)	146 (96.7)	
Extra salt				$\chi^2=7.5115$ Df = 1 P value =0.006
Yes	32 (66.7)	59 (57.3)	75 (49.7)	
No	16 (33.3)	44 (42.7)	76 (50.3)	

117

118 Table 2 shows that family history of hypertension is associated with stage -2 disease and adding
 119 extra salt to food is associated with stage 1 disease.*=Fishers exact.

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121 Table 3: Anthropometric variables of young hypertensive respondents attending general out-
 122 patients clinic in Uyo

Variables	Hypertension		Total	Statistical indices
	Stage 1	Stage 2		
Weight (kg) Mean (SD)	75.3 (11.8)	73.1 (12.9)	73.8 (12.5)	tt=0.9972 Df = 149 P value =0.320
Height (cm) Mean (SD)	164.9 (9.2)	162.5 (7.9)	163.3 (8.4)	tt=1.6933 Df = 149 P value =0.0925
BMI (kg/m2) Normal Overweight Obese	14 (29.2) 18 (37.5) 16 (33.3)	35 (34.0) 36 (35.0) 32 (31.1)	49 (32.5) 54 (35.8) 48 (31.8)	$\chi^2=0.3461$ Df = 2 P value =0.841
Waist circumference Median (interquartile range)	91 (20)	88 (15)	89 (16)	Z=1.088 P value= 0.2768

Waist hip ratio				$\chi^2=1.9423$
Normal	36 (75.0)	87 (84.5)	123 (81.5)	Df = 1
Abnormal	12 (25.0)	16 (15.5)	28 (18.5)	P value =0.163

123

124 **Result:**

125 A total of one hundred and fifty one (n=151) respondents were recruited into the study. 48
 126 respondents had stage 1 hypertension while 103 had stage 2 hypertension (JNC7). More women
 127 had hypertension n=84 (55.6%) with n=58 (56.3%) of them having stage 2 hypertension. More
 128 respondents n=26(54.2%) with secondary level of education had stage 1 hypertension while
 129 n=53(51.5%) with tertiary level of education had stage 2 hypertension. Married respondents
 130 n=78(51.7%) had hypertension (n=22(45.6%) had stage 1 and n=56(54.4%) had stage 2). Traders
 131 n=46(30.5%) were more than other respondents in occupation. See details in table one

132 Family history of hypertension was present in n=79(52.3%) while n=72(47.7%) respondents did
 133 not have any family history of hypertension. Stage 2 hypertension was associated with having a
 134 positive family history of hypertension, p=0.001. Most of the respondents did not have co-
 135 morbid diabetes mellitus n=141(93.4%) and having diabetes mellitus was not associated with
 136 stage 1 or 2 hypertension. Majority of the respondents did not take significant alcohol
 137 n=134(88.7%), did not smoke cigarette n=146(96.7%), but n=75(49.7%) added extra salt to meal
 138 on table before eating and it was associated with stage 1 hypertension p=0.006.

139 Mean weight of respondents was 73.8kg (12.5 SD), mean height of respondents was 163cm
 140 (8.4SD), n=54(35.8%) were overweight, median waist circumference was 89cm and waist hip
 141 ratio was normal in n=123(81.5%). There was no significant statistical association between
 142 hypertension and anthropometric variables in young people in this study.

143

144 **Discussion**

145 Essential hypertension was rarely diagnosed in young people previously but is now commonly
 146 seen in many centers. Hitherto, hypertension in young person were diagnosed as secondary
 147 hypertension until proven otherwise. This study of 151 young persons with hypertension showed
 148 that essential hypertension was commoner among young females than young males compared to
 149 previously held view that hypertension was commoner among males until age 65 when it
 150 becomes commoner among females. The finding agrees with the work of Ulasi et al that found
 151 that hypertension was commoner among young women aged 20-30 years than males¹⁹.

152 On educational level of respondents in previous studies, it was shown that the less educated a
 153 respondent was, the more likely the person to develop hypertension. This is supported by the

154 work of Harvard school of public health on African Americans that showed that low educational
155 level was a risk factor for hypertension²⁰. Wang et al also found that respondents with low level
156 education had greater frequency of hypertension 27.7% while those with middle level education
157 (18.8%),and those with higher level of education had less frequency of hypertension(15.8%)²¹.
158 However, in this study the reverse was found. Few respondents with low level or no education at
159 all n=17(11.2%) had hypertension while those respondents with middle and higher education had
160 higher frequency of hypertension n=134(88.8). More research may be needed to find out this
161 difference in educational level and hypertension occurrence among blacks living at home.

162 Family history of hypertension is an additive risk factor for development of essential
163 hypertension. This study found that a positive family history of hypertension was a strong factor
164 for development of hypertension in young people p=0.001. Van der Sande et al had reported that
165 people with a positive family history of hypertension were likely to develop hypertension at a
166 younger age²². Positive family history of hypertension is also a predictor of increased
167 susceptibility to hypertension because of interaction between genetic trait, environmental factors
168 and behavior.

169 High salt diet is another risk factor for developing hypertension. The relationship between salt
170 intake and blood pressure is direct and progressive as there is a dose response relationship
171 between salt intake and blood pressure in the range of 3 to 12g of salt intake per day²³. In this
172 study, there was a relationship between adding extra salt to meal before eating and stage one
173 hypertension p= 0.006.

174 Obesity increases the risk of development of hypertension; numerous clinical and animal studies
175 have confirmed a strong relationship between obesity and hypertension²⁴. There was no
176 significant relationship between obesity and hypertension in this study even-though n=54(35.8%)
177 were overweight.

178 **Conclusion:** Young people affected by hypertension are becoming numerous in my
179 environment. Many factors have been known to be associated with development of hypertension
180 at a younger age but amongst them, having a positive family history of hypertension and adding
181 extra salt to serve meals were strongest. So, regular screening of young people with family
182 members with hypertension and desisting from adding extra salt to serve meals will be
183 beneficial.

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