

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(new cases) 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 JNC 7 classification while 103 had stage 2 hypertension JNC 7 classification. More women had hypertension n=84(55.6%). Respondents with secondary level of education had more stage 1 hypertension JNC 7 classification while those respondents with tertiary education had more stage 2 hypertension JNC 7 classification. Married respondents had more of stage 2 hypertension JNC 7 classification 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 JNC 7 classification 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 JNC 7 classification 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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35 Introduction

36 Hypertension or high blood pressure is a chronic medical condition in which the systemic arterial
37 blood pressure is elevated.[1] Hypertension is taken as blood pressure reading greater than or
38 equals to 140mmHg Systolic and greater than or equals to 90mmHg Diastolic. [2] JNC 7
39 classifies hypertension into normal<120/80mmHg, pre- hypertension 120-130/80-89mmHg,
40 stage 1 hypertension 140-159/90-99mmHg and stage 2 hypertension >160/100mmHg.[3] **A**
41 **systolic blood pressure of <120mmHg is considered ideal with each 10mmHg increase in blood**
42 **pressure being accompanied by a 10% greater risk of cardiovascular event and mortality.[4]**
43 About one billion people in the world have Hypertension [5] of which young people between
44 the ages of 18 and 44 years constitute 6% (national health and nutrition evaluation studies
45 2009-2011).[6] Hypertension occurs among young people in Nigeria with reported prevalence
46 of 3.3% in South East region [7], 4.3% in Northern region [8] and 30% in South West region.[9]

47 Certain risk factors are known to predispose people to development of essential Hypertension.
48 These factors include non modifiable factors like age (45 years and above)[10], sex (males more
49 than females until age 65years) [10], race (black race) [11] and positive family history [12.13].
50 Modifiable factors include overweight, obesity, cigarette smoking, excessive alcohol intake,
51 excessive salt intake and others.

52 Overweight (25.0kg/m^2 - 29.9kg/m^2 and obesity ($\text{BMI} >30\text{kg/m}^2$) are known to predispose to
53 Hypertension. A study on Africans reported that 6-29% of Hypertension was attributed to
54 overweight and 1-16% was attributed to obesity. [14] Also, obesity may increase the risk of
55 hypertension five fold compared to normal weight. [15] Cigarette contains nicotine which is
56 known to cause release of catecholamine that increase blood pressure and heart rate [16].
57 Excessive alcohol intake (more than 14 units per week for women and more than 21 units per
58 week for men) causes an increase in blood pressure [17]; this it does by stimulating the
59 sympathetic nervous system and increasing adrenocorticoid hormone in circulation [18].
60 Excessive salt intake more than 6g per day [19] is a known risk factor for hypertension through
61 its effect on expansion of the extracellular fluid volume, induction of cardiac myoblast and
62 smooth muscle hypertrophy, activation of NF-Kappa B in proximal tubular cells of the kidney
63 leading to inflammation and changes in the Renin Angiotensin System as well as induction of
64 oxidative stress.[20] Other factors that predispose to hypertension are sedentary lifestyle,
65 exposure to chronic stress, diabetes mellitus and dyslipidaemia.

66 **Since there is scarcity of study in Uyo, Akwa Ibom State. Nigeria on risk factors for essential**
67 **hypertension in young people so this study was undertaken to determine the risk factors and**
68 **anthropometric variables of young people** diagnosed with essential hypertension with the aim of
69 filling the knowledge gap and bringing out which risk factors have the strongest effect on young
70 persons who develop essential hypertension.

72 **MATERIALS AND METHODS**

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

76 A semi-structured questionnaire was administered to consenting young people diagnosed with
77 essential Hypertension. The instrument sought information on age, sex, tribe, occupation and
78 marital status. The questionnaire also sought information on risk factors like history of cigarette
79 smoking(current smokers-those that were currently smoking and non smokers- those that never
80 smoked or used to smoke but stopped smoking at least five years ago, significant alcohol
81 intake,(men who took more than 21 units of alcohol per week, women who took more than 14
82 units of alcohol per week , a unit of alcohol was 10 ml of ethanol or 8g of alcohol in various
83 forms beer, spirits and wine), adding salt to meals on table before eating (self report by
84 respondents), exposure to excessive stress on the job, in the family and finance (self report by
85 respondents). Other risk factors assessed were family history of Hypertension (mainly first
86 degree relatives), personal history of diabetes mellitus and family history of diabetes mellitus.

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

92 Height was measured with the subjects standing barefooted against an erect metric rule placed on
93 a perpendicular wall. The subjects stood erect, barefooted, heels together against the wall with
94 the buttocks and back touching the metric rule. The subjects looked straight ahead and a 30cm
95 metric rule was placed on the head of the subjects to note the height of the subject on the metric
96 rule on the wall. The subject moved away from the 30cm metric rule, the height of the subject
97 was read at the point of the head piece on the calibrated wall metric rule to nearest 0.1cm. The
98 body mass index was calculated using the formula $BMI = \frac{WEIGHT (kg)}{HEIGHT (m)^2}$. Waist
99 circumference was done with a measuring tape applied to waist line which is the equidistant
100 abdominal circumference between the costal margin and the iliac crest. The hip circumference
101 which is the widest circumference of the hip was done by measuring the inter-trochanteric
102 diameter of the right and left hip.

103 The blood pressure of the subject was measured using Accuson mercury sphygmomanometer
104 with cuff of appropriate size in a sitting position. Korotkoff sounds one and five were used as
105 systolic and diastolic blood pressure respectively. Two measurements were taken for each
106 subject at 5 minutes interval and the mean blood pressure was used for the analysis. Systolic
107 blood pressure of 140mmHg and above and Diastolic blood pressure of 90mmHg and above
108 were taken as Hypertension [2].

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

113 Exclusion criteria were young persons with secondary hypertension, persons with essential
 114 hypertension above the age of 44 years, young persons with hypertensive heart failure or those
 115 with essential hypertension who were too ill to partake in the study. **Informed written consent**
 116 was received from all subjects selected. Ethical approval was obtained from the Ethical
 117 Committee of the University of Uyo Teaching Hospital for this study. Data analysis was done
 118 using SPSS17.0 version. Results are presented as frequencies and proportions, Chi square was
 119 used while level of significance was set at 0.05.

120

121 Table 1: Socio demographic characteristics of young hypertensive patients attending general out-
 122 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)	
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124 Table 1 shows that socio demographic characteristics of both stages of disease are similar among
 125 the respondents.*= Fishers exact.

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

Variable	Hypertensive		Total	Statistical indices
	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)	

128

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

131

132 Table 3: Anthropometric variables of young hypertensive respondents attending general out-
 133 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 Normal Abnormal	36 (75.0) 12 (25.0)	87 (84.5) 16 (15.5)	123 (81.5) 28 (18.5)	$\chi^2=1.9423$ Df = 1 P value =0.163

134

135 **Result:**

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

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

150 Mean weight of respondents was 73.8kg (12.5 SD), mean height of respondents was 163cm
151 (8.4SD), n=54(35.8%) were overweight, median waist circumference was 89cm and waist hip
152 ratio was normal in n=123(81.5%). There was no significant statistical association between
153 hypertension and anthropometric variables in young people in this study.

154

155 **Discussion**

156 Essential hypertension was not commonly diagnosed in young people previously but is presently
157 commonly seen in many centers. Previously, hypertension in a young person was diagnosed as
158 secondary hypertension until proven otherwise. This study of 151 young persons with
159 hypertension showed that essential hypertension was commoner among young females than
160 young males compared to previously held views that hypertension was commoner among males
161 until age 65 when it becomes more common among females. The finding of this study agrees
162 with the work of Ulasi et al that found that hypertension was commoner among young women
163 aged 20-30 years than young males [21].

164 On educational level of respondents diagnosed with essential hypertension, previous studies
165 showed that the less educated a respondent was, the more likely the person to develop essential
166 hypertension. This is supported by the work of Harvard school of public health on African
167 Americans that showed that low educational level was a risk factor for hypertension [22]. Wang
168 et al also found that respondents with low level education had greater frequency of hypertension
169 27.7% while those with middle level education (18.8%), and higher level of education had less
170 frequency of hypertension (15.8%) [23]. However, in this study the reverse was found. Few
171 respondents with low level of education or no education at all $n=17(11.2\%)$ had hypertension
172 while those respondents with middle and higher level of education had higher frequency of
173 hypertension $n=134(88.8)$. **The finding from this study collaborates the work of Tedesco et al
174 that found that most hypertensive had higher education [24].** The finding of hypertension among
175 highly educated people in my environment may be due to adoption of western lifestyle and
176 behavior.

177 Family history of hypertension is an additive risk factor for development of essential
178 hypertension. This study found a positive family history of hypertension as a strong factor for
179 development of stage 2 JNC 7 hypertension in young people $p=0.001$. Van der Sande et al had
180 reported that people with a positive family history of hypertension were likely to develop
181 hypertension at a younger age [25]. **Also Ranasinghe et al found the prevalence of hypertension
182 to be significantly higher in subjects with family history of hypertension than those without a
183 family history [25].** In addition, positive family history of hypertension is also a predictor of
184 increased susceptibility to hypertension because of interaction between genetic trait,
185 environmental factors and behavior.

186 High salt diet is another risk factor for developing hypertension. The relationship between salt
187 intake and blood pressure is direct and progressive as there is a dose response relationship
188 between salt intake and blood pressure in the range of 3 to 12g of salt intake per day [27].
189 **Though ,some studies say only those individuals with salt sensitivity develop hypertension with
190 increase salt intake [28] :** this study found a relationship between adding extra salt to meal before
191 eating and stage one hypertension JNC 7 classification $p= 0.006$ maybe those with this response
192 are salt sensitive.

193 Obesity increases the risk of development of hypertension; numerous clinical and animal studies
194 have confirmed a strong relationship between obesity and hypertension [29]. There was no
195 significant relationship between obesity and hypertension in this study even-though n=54(35.8%)
196 respondents were overweight.

197 **The use of self report to measure some risk factors brought recall bias which may be a limitation**
198 **in this study.**

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

205 Conflict of interest: No author has shown any conflict of interest.

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