Evaluations of Hypertension among Adult Residents of Tinda Rural Community, Nigeria

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Hypertension is a leading mortality hazard universally and locally in Nigeria. This study aimed to determine its prevalence in an underserved village in Northeastern Nigeria. A cross-sectional study design was employed for the community-based study. Purposive sampling was used to select 78 adults who voluntarily took part in a medical outreach organized by a Non-Governmental Organization (Living Stone Explorers) in the village. The study was carried out in Tinda village, Dukku local government area Gongbe State, Nigeria. The data collected were analyzed via descriptive and inferential statistics using the Statistical Package for Social Sciences (SPSS), version 20. The respondents had a mean age of 33.5±13.6. A statistically significant relationship was derived between hypertension and age of participants (p=0.02 for diastolic Blood pressure and p=0.07 for systolic blood pressure). The prevalence of hypertension from this study was found out to be 26.9% which is slightly higher to that reported in other studies among rural respondents. The result from this study proposes the prevalence in the rural area is still lower compared to surveys conducted in urban areas. However, there is need for routine checks by establishments like the primary health care centers, so as to forestall mortalities identified with hypertension.

Keywords: Hypertension, Systolic, Diastolic, Rural, Prevalence, High Blood Pressure.

INTRODUCTION

High blood pressure (HBP) is a non-communicable chronic disease of high prevalence, regarded as a relevant Public Health issues, and is among the five major global mortality risks (WHO, 2009). According to the World Health Organization (WHO), one out of three adults presents HBP (WHO, 2012). In light of the Joint National Committee (JNC) classification, people with systolic blood pressure ≥140mmHg and/or diastolic blood pressure ≥90mmHg are hypertensive (JNC, 1993).

Globally, 1.13 billion of the total population of the earth has hypertension, 1 in 4 men and 1 in 5 women have been diagnosed with hypertension (WHO, 2019). In the year 2008, the total prevalence of increased blood pressure in adults was of about 40% whereby the number of individuals who had their blood pressure uncontrolled saw a significant rise from 600 million in the year 1980 to 1 million in the year 2008 (WHO, 2015). According to WHO, Africa recorded the highest prevalence of increased blood pressure with about 46%. In a study done by Effiong et. al. in 2015, it was discovered that there was a higher prevalence of hypertension in the rural communities than in the urban communities. It has been estimated that about 8 million Nigerians suffer from hypertension, (Nigeria Pilot, 2013).

High prevalence of hypertension has been reported in some recent studies conducted in Nigeria. Hypertension is the most common non-communicable disease in Nigeria. Hypertension and its complications constitute

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Methods of emergency medical admissions in urban hospitals in Nigeria (Makusidi et al., 2013). A significant number of rural dwellers seek consultations with indigenous and private health care practitioners, where regular screening for hypertension is not practiced. Few studies have demonstrated the occurrence of hypertension and its predisposing risk factors in rural areas of Nigeria. A prevalence rate is an important tool for assessing the magnitude and burden of a health event. Determining the prevalence of hypertension will help estimate its magnitude in the community.

This study is therefore conducted to find the recent prevalence of hypertension in a rural community

**MATERIALS AND METHODS**

**Study area**

The research was carried out in Tinda (10°47'14.23-Latitude/10°53'26.38- Longitude), a rural settlement located in a local government area (LGA) called Dukku local government (10°49'N10°46'E/10.817°N10.767°E), Gombe State, Northeastern region of Nigeria. The community is about 25 km from the state capital. The predominant occupation of the people is animal husbandry, farming, and trading. Gongola River courses through the west and north of the local government area. Dukku LGA is one of the 11 local government areas of Gombe State. The land mass of the local government is 3,815 km² with a population of 207, 190 as at the last census. There significant ethnic group is Fulani and the major language communicated is Fulfide spoken. A map showing the LGA is demonstrated below.

**Study design and sampling method**

A cross-sectional study design was employed for the community-based study. There are about 100 households in the village, with about 200 adults and 500 children. Purposive sampling was used to select 78 adults who voluntarily took part in a medical outreach organized by a Non-Governmental Organization (Living Stone Explorers) in the village.

**Data collection**

A health check-up service was provided by healthcare workers for a period of three days in the village. The medical professional setup in a temporary out-patient clinic, where data was obtained from all the respondents. The participants were allowed to rest at least for 15 minutes in a sitting posture before their vital signs were checked. Body temperature was measured with the aid of a digital thermometer. The thermometer was cleaned with an alcohol swap to disinfect and was then placed under the armpit (axilla) of the respondents until a signal sound was heard to indicate the reading has already been taken. The temperature was then recorded in degree Celsius. Blood pressure was measured using Aneroid mercury sphygmomanometer and 3M Littmann classic II SE stethoscope.

**Data management and analysis**

The data gathered for the research were analyzed utilizing the Statistical Package for Social Sciences (SPSS), version 20 International Business Machine (IBM). Descriptive statistics were utilized to obtain frequency distribution tables, while inferential statistics like chi-square, independent t-test, and Analysis of Variance (one way-ANOVA) was likewise used to decide the degree of relationship among selected variables of interest at 95% confidence interval.

The recorded blood pressure values of the respondents were divided into four (JNC, 2003):
- Normal: Systolic lower than 120 mmHg and Diastolic lower than 80 mmHg,
- Pre-hypertension: Systolic 120-139 mmHg and Diastolic 80-89 mmHg,
- Stage 1 Hypertension: Systolic 140-159 mmHg and Diastolic 90-99mmHg,
- Stage 2 Hypertension: Systolic ≥160 mmHg and Diastolic ≥100 mmHg.

**Ethical Consideration**

The three broad principles, namely; beneficence, respect for human dignity and justice on which standards of ethical conduct research are based were followed to ensure Codes of Ethics and good practice for the protection of the participants. The respondents voluntarily participated in the outreach; verbal agreement was reached as regards to using the data obtained for research publication. No form of coercion or undue compensation was given to the participants. Under-aged residents were not permitted to participate. The respondents were given assurance of upmost confidentiality of data, no names were recorded.

**RESULTS**

**Socio-demographic characteristics**

Of the 78 participants, the dominant group of 43 (55.1%) were males. The mean age of the respondents was 33.50 ±13.64 years, the male participants were 35.98±15.00, while the female participants were 30.46±1.23 years. Over Eighty nine percent (89.7%) of the participants were married, while 10.3% were single. The common occupations reported were, farming 44 (56.4%) and trading 17 (21.8%). A chart showing the common occupations can be seen in Figure 1.
The above figure illustrates the percentages of occupation of respondents. Dominant part of the participants was farmers while minorities were herdsmen.

**Anthropometric characteristics and vital signs**

The age and anthropometric characteristics of the participants are shown in Table 1.

**Table 1**: Anthropometric characteristics, and vital sign values of participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>All (78)</th>
<th>Male (43)</th>
<th>Female (35)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>33.50 ±13.64</td>
<td>35.98 ±15.00</td>
<td>30.46 ±11.23</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>60.31 ±10.14</td>
<td>63.21 ±9.58</td>
<td>56.74 ±9.78</td>
</tr>
<tr>
<td>Temperature (°C)</td>
<td>35.95 ±0.89</td>
<td>35.80 ±0.87</td>
<td>36.13 ±0.90</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>127.0 ±11.48</td>
<td>126.2 ±13.72</td>
<td>127.8 ±8.04</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>83.5 ±19.60</td>
<td>89.6 ±20.77</td>
<td>75.9 ±15.17</td>
</tr>
</tbody>
</table>

The above table illustrates the anthropometric characteristics of the respondents such as the age, sex, weight and vital signs such as temperature and blood pressure of the participants.

**Figure 2**: Systolic and Diastolic blood pressure Frequencies of participants

As shown in Figure 2; 8 (10.3%) and 14 (17.9%) participants had normal systolic and diastolic blood pressure respectively; 48 participants had prehypertension systolic blood pressure and 44 of them had diastolic blood pressure; 26.9% of the participants had Stage 1 systolic blood pressure and 3.8% had stage 1 diastolic blood pressure; 1 (1.3%) and 17 (21.8%) had Stage 2 systolic and diastolic blood pressure respectively.

**Table 2**: Systolic and diastolic blood pressure readings against Frequency, sex and age

<table>
<thead>
<tr>
<th>Systolic BP</th>
<th>Sex of respondents</th>
<th>Age 20-35 P=0.014</th>
<th>Age 36 and above P=0.000</th>
<th>Marital status</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Male P=0.542</td>
<td>Female</td>
<td></td>
<td></td>
<td>8(10%)</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>48(62%)</td>
<td>21(49%)</td>
<td>27(77%)</td>
<td>44(63%)</td>
<td>12(19%)</td>
</tr>
<tr>
<td>Stage 1&amp;2</td>
<td>22(28%)</td>
<td>15(35%)</td>
<td>10(20%)</td>
<td>44(63%)</td>
<td>6(10%)</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>Frequency</td>
<td>Male P=0.002</td>
<td>Female</td>
<td>Age 20-35 P=0.000</td>
<td>Age 36 and above P=0.000</td>
</tr>
<tr>
<td>Normal</td>
<td>14(18%)</td>
<td>4(9%)</td>
<td>10(29%)</td>
<td>12(22%)</td>
<td>2(10%)</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>44(46%)</td>
<td>22(5%)</td>
<td>36(67%)</td>
<td>5(24%)</td>
<td>38(54.3%)</td>
</tr>
<tr>
<td>Stage 1&amp;2</td>
<td>20(26%)</td>
<td>17(40%)</td>
<td>6(11%)</td>
<td>20(27.6%)</td>
<td>0(0%)</td>
</tr>
<tr>
<td>TOTAL (100%)</td>
<td>78</td>
<td>43</td>
<td>35</td>
<td>54</td>
<td>70</td>
</tr>
</tbody>
</table>

Table 2 illustrates Blood pressure readings against sex and age of participants. Majority (62%) of respondents have pre-hypertension with systolic BP and 46% with diastolic BP. Majority of the respondents with high blood pressure belongs to the older adults group within the range of age 36 and above. Also, men are more hypertensive than women according to the above table.

**Table 3**: Association between respondents’ average BP and 120/80 reference

<table>
<thead>
<tr>
<th>One-Sample Test</th>
<th>Systolic and Diastolic BP Test Value = 120 and 80 respectively</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>Df</td>
</tr>
<tr>
<td>Systolic</td>
<td>5.384</td>
</tr>
<tr>
<td>Diastolic</td>
<td>1.577</td>
</tr>
</tbody>
</table>
The above table illustrates the relationship between respondents average BP and 120/80 reference values. The data was revealed to be normally distributed by a plot. A statistically significant difference (p < 0.000) was seen between the average systolic blood pressure (127±11.5) and the reference value of 120. There was no significant contrast (p > 0.119) between the average diastolic blood pressure (83.5±19.6) and the reference value of 80.

Table 4: Prevalence of Hypertension in different occupations

<table>
<thead>
<tr>
<th>Systolic BP</th>
<th>Farmers</th>
<th>Traders</th>
<th>Herdsmen</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>5(11.4%)</td>
<td>0(0.0%)</td>
<td>2(25.0%)</td>
<td>1(11.1%)</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>31(70.5%)</td>
<td>11(64.7%)</td>
<td>2(25.0%)</td>
<td>4(44.4%)</td>
</tr>
<tr>
<td>Stage 1&amp;2</td>
<td>8(18.2%)</td>
<td>6(35.3%)</td>
<td>4(50.0%)</td>
<td>4(44.4%)</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>Farmers</td>
<td>Traders</td>
<td>Herdsmen</td>
<td>Others</td>
</tr>
<tr>
<td>Normal</td>
<td>9(20.5%)</td>
<td>3(17.6%)</td>
<td>2(25.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>28(63.6%)</td>
<td>7(41.2%)</td>
<td>2(25.0%)</td>
<td>7(77.8%)</td>
</tr>
<tr>
<td>Stage 1&amp;2</td>
<td>7(15.9%)</td>
<td>7(41.2%)</td>
<td>4(50.0%)</td>
<td>2(22.2%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>44</td>
<td>17</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

Table 4: Illustrates the prevalence of hypertension among different occupations. Herdsmen had the highest percentage of hypertension

DISCUSSION

Hypertension and its risk factors

The prevalence of hypertension from this study was found out to be 26.9% which is slightly higher to that reported by Oladapo et al. (20.8%) and Andy et al. (23.6%) in their studies among rural respondents. Also, the prevalence from this study almost doubles that reported by Okesina et al. (15.4%) in a rural area (Maiduguri) in same geographical location (north-eastern part of Nigeria).

As regards geographical location, the prevalence of hypertension has been observed to be lower in rural areas when contrasted with that of urban communities. From the survey carried out by Adeloye et al., the outcomes indicated a higher urban prevalence in contrast to rural areas (31% versus 26%). This is synonymous to other related research works done in African nations where higher predominance rates have been accounted for among urban occupants (Addo et. al., 2007). As indicated by Mezue, 2019, the higher predominance among urban populaces may depict an alternate way of lifestyle. It was stressed that urban inhabitants are bound to eat foods that are handled and food sources that have high salt and fat substance. Moreover, as reported by Cecchini et al., the lower rural predominance may show higher physical day to day activity levels from having a long walk and physically saddling cultivating work, also, people living in the rural communities have greater access to vegetables and fruits and they consume more organic foods compared to those living in urbanized areas. However, few studies show contrary. Study carried out by Okpechi et. Al (2013), in Abia state (eastern part of Nigeria), it was identified that the prevalence of hypertension in rural settlements was higher than in urban area. There was no statistically significant relationship between Hypertension and sex of respondents in this study which is consistent with the report by Adediran et al (2013) who did likewise discover any factually critical sex contrast in their investigation of hypertension prevalence in an urban and rural settlement of Nigeria.

The findings of this study revealed that hypertension is more dominant in males (37.2%) than in female (14.3%) which result due to the fact that the genders were not equally distributed because men took part more in the research than women. This higher prevalence for male is also reported in similar studies. Ajayi et al. (2016) reported a higher prevalence in male than female (male 36.8% and female 31.1%) amongst people living in Ibadan, Oyo State. Onwubere et al. (2011), likewise revealed that hypertension was more in the males (50.2% vs. 44.8%). Additionally, this research work is in concurrence with the discoveries of Ahaneku et.al (2011) who reported hypertension was more prevalent in males than in female participants. This could be due to societal socio-economic roles relegated to men in the home where they need to provide greater part of the funds to family support (Bello, 2013).

CONCLUSION

In spite of limitations, this research gave an outline of the prevalence of hypertension with its risk factors among occupants of Tinda people group, Gombe state, Nigeria. Portable Health field Clinic was effective for check-up services for rural areas like Tinda, Gombe state. Further studies on prevalence of other Non-communicable diseases should be done in the same study area as they have little or no access to health care service.

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CONFLICT OF INTEREST

No conflict of interest was recorded by the authors.
REFERENCES


