ORIGINAL ARTICLE

A COMMUNITY WHERE SALT FEEDS SOME AND KILLS MANY: A DISCOVERY OF NEW HYPERTENSIVE COHORTS

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ABSTRACT

Systemic hypertension is endemic, epidemic and pandemic in the modern world. The world prevalence of hypertension among those >25 years is 4 - 40% while the prevalence in Ebonyi State, Nigeria is 23.2%. The predisposing factors globally outlined and studied include age, gender, obesity, smoking and race. The role of salt as a predisposing factor is a subject under strong debate by researchers. Here we report an agrarian community with salty yam and other crops, who drink brine and boil same to make salt for sale to far away communities. This community has prevalence of hypertension among 50 – 59-year olds as **61.36%** and 60 – 69-year olds as **66.05%.** In this community, most hypertensive adults die before the age of >70 years making prevalence of hypertension to drop to **57.39%** at 70 - 79 years and continues to drop per decade. This is against the general knowledge that prevalence of hypertension increases with age. This study serves to stimulate further research on the role of sodium in this high prevalence of hypertension and the need for intervention to improve the quality of life and longevity among this cohort. It is an original report that is valuable to epidemiologists, other medical researchers and humanitarian agencies.

KEY WORDS: Hypertension, Prevalence, Salt, Okposi, Community, Outreach, Isuajah, Christian

INTRODUCTION

Hypertension is defined as systolic blood pressure >140mmHg and or diastolic blood pressure >90mmHg among those >25 years.[1] Hypertension is a global public health challenge with rising prevalence which is attributed to changes in life style especially consumption of refined food.[2,3] Predisposing factors to hypertension include age, gender, obesity, smoking and race.[2] The findings of lower prevalence in agrarian communities as compared to urban communities support the attribution of rising prevalence of hypertension to lifestyle changes.[4] Salt has been implicated in the epidemiology, aetiology, pathogenesis and control of hypertension but its defined roles in these is still a subject of debate.[5]

The controversial African gene hypothesis attributed increase in prevalence of hypertension among African blacks to a genetic defect in sodium excretion.[6] In addition, there is a recent concept that explained familial predisposition to hypertension based on salt sensitivity and salt intake.[7] There is also association of many genetic

polymorphisms with increased salt sensitivity and hypertension.[8] These three developments among others tend to fill the vacuum created and consequent debate raised by epidemiological data inconsistences on the role of salt.

The global prevalence of hypertension among the >25 year olds is 4 – 40%(1) and 46% in Africa,[9] 33.1% in western Nigeria,[10] 23.2% in Southern Nigeria[11] and 33.2% in Northern Nigeria.[12] Hypertension is a major cause of cardiovascular complications and death globally, ranking first in Nigeria[13] such that any preventive approach will be greatly appreciated by local and global community.

METHODOLOGY:

STUDY DESIGN AND LOCATION

THE COMMUNITY: Okposi is an autonomous community in Ohaozara Local Government Area in Ebonyi State Nigeria, West Africa. She has 8 villages with a river called Esu. The river arcs the community and bears names depending on the village the river is accessed from, such as Esu Amenu, Esu Amenagu and Esu Mgbom N'achara among others. However, being an arc, some villages do not have a river. The community is an agrarian one with the villages heaving an Esu doing fishing in addition. The community has a central area called Court Area, where civilisation is domiciled and the markets where civilisation spilled to. She also has a salt Lake called Mmahi, with the brine yielding up to 25% of salt. Esu is also salty but with less salt concentration compared to Mmahi. The people drink from Esu while at their farms and while fishing and also streams which are tributaries of Esu while at home or in villages without Esu. The streams are less salty compared to Esu. In the recent past, there have been interventions by governments and donor agencies via sinking of boreholes whose water are also salty, with some equating to Mmahi. Mmahi supplied salt to the entire then Biafra Land during the Nigerian/Biafra civil war, a period during which the lake was emptied to reveal a depth the size of a 5 storey building, a white floor (probably salt deposit) and a huge spring. It is possible that this is a community sitting on a huge sodium chloride deposit. See map below:

Figure 1: Map of Okposi.

In this community, men and women walking to the farm frequently collapse with limb paralysis, speech difficulties, urinary incontinence and, or foam in the mouth. These subjects are traditionally believed to have offended the ancestors and were mysteriously slapped by them to develop those symptoms. The severity of slap, it is believed, depends on the type of abomination committed. Some slaps could subsequently lead to swollen face, feet and abdomen.

THE ENCOUNTER:

This study was conducted during the 11th edition of Okposi Christian Graduate and Undergraduate Forum; https://ocguf.org, https://youtu.be/ExISkK4bWfw, free medical and surgical outreaches, in December 2018. The outreach lasted for three days. A total of 2,555 persons were registered and given treatment out of which 883 persons had their information captured and used for this study. Participants were serially recruited after an informed consent.

Hypertension was defined as systolic blood pressure >140mmHg and, or, diastolic blood pressure >90mmHg. Data analysis was done with 2010 excel.

RESULTS

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	883	9.00	110.00	52.6772	17.00864
Valid N (listwise)	883				

Table 1: Age statistics

The overall prevalence of hypertension among those 20 years and above **was 51.79%.** The prevalence rose with age and peaked among those aged 60 – 69 years with prevalence of **66.05%** then declined sharply. The prevalence among age groups is illustrated in the table and figure below:

Age Group in Years	Total Number	Number Hyper tensive	Pre valence
20 – 29	71	8	**11.27%**
30 – 39	111	39	**35.14%**
40 – 49	130	61	**46.92%**
50 – 59	220	135	**61.36%**
60 – 69	162	107	**66.05%**
70 – 79	115	66	**57.39%**
80 – 89	51	29	**52.94%**
90 -99	5	3	**60.00%**

Table 2: Age group prevalence of hypertension

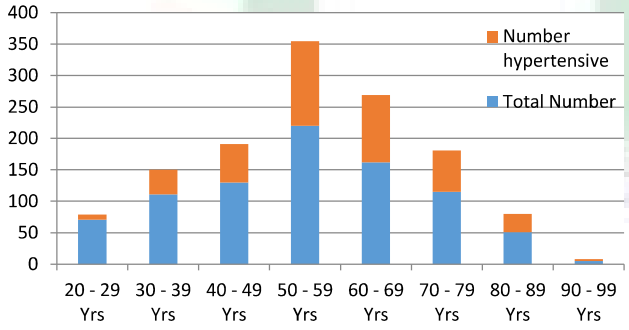

Figure 2: Number of hypertensives per age group

The prevalence among Males and females are **55.43% and 50.22%** respectively.

The prevalence of hypertension among farmers and traders were **57.77% and 47.00%** respectively.

The village in which Mmahi is situated called Okposi Okwu has prevalence of **53.43%,** while the nearest village to Okposi Okwu called Mgbom N'achara has prevalence of **49.33%.** The villages bounded by Esu, Mebiowa N'amanegu, Amechi and Amenu, have prevalence of Hypertension as **49.70%, 50.00%** and **61.54%** respectively. The remaining villages not bounded by Esu, Umuka N'umunuka, Mebiokpa N'ameke and Avu N'umuiwa have prevalence of hypertension as **45.80%, 44.12%** and **42.86%** respectively. See Bar Chart below:

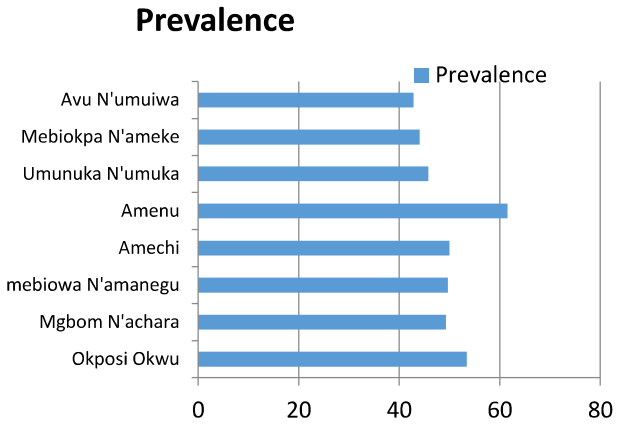

Figure 3: Prevalence of hypertension per village

DISCUSSION

There is a very high prevalence of hypertension in this community as presented. This defies common knowledge about prevalence of hypertension which is believed to be higher in urban communities compared to rural or agrarian communities.[4] However, within the community there is higher prevalence among farmers as compared to traders. This can be explained by the fact that farmers drink from Esu while at work, thereby taking more sodium than the traders who most times buy and drink sachet water from companies. The above argument; that increase in blood pressure is dependent on dose-of-sodium-intake, is further demonstrated by very high prevalence of hypertension in Amenu village. They have the biggest Esu and virtually drink from it. The other villages bounded by the river like Mebiowa N'amanegu and Amechi also have high prevalence while prevalence declined among villages without Esu namely, Umuka N'umunuka, Mebiokpa N'ameke and Avu N'umuiwa. Even the village where Mmahi is domiciled and the village nearest to it, Okposi Okwu and Mgbom N'achara respectively, have high prevalence.

There is higher prevalence among males which is in keeping with research findings.[14] The impact of age as risk factor is also seen as prevalence increased appreciably per decade increase in age. This increase of prevalence with age however peaks at 69 years and declined sharply. These further stresses the burden of hypertension in this cohort. The abrupt

decline can be explained by early death of the Hypertensives, leaving only those who were not hypertensive from the beginning and few hypertensives who made it beyond this age.

The relative higher prevalence of hypertension in villages around Mmahi and those bounded by Esu seems to favour an argument for dose-of-sodium-intake dependent increase in incidence of hypertension and suggests a role for sodium in epidemiology, aetiology and pathogenesis of hypertension.

This role may be due to familial predisposition,[7] genetic polymorphism[8] or up regulated sodium sensitivity of other aetiology. The answer to this is a subject for future research.

It is important to point out that there may be under estimation of prevalence since those with apparently normal blood pressure in this community may be hypertensive because this data does not have a column for those on antihypertensive.

This study is sufficient to evoke interventions in the lives of this cohort by government and non-governmental organisations. The provision of potable water passed through resin, free antihypertensive drugs; specifically diuretic type, and rehabilitation of those already suffering complications will form the initial steps.

CONCLUSION

The high prevalence of hypertension as reported in this study presents a need for further research and begs for intervention in the lives of the inhabitants of this community.

COMPETING INTEREST

The authors declare that they have no competing interests.

AUTHORS' INFORMATION

Authors are from this community.

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