Community awareness of stroke, hypertension and modifiable risk factors for cardiovascular disease in Nkonya-Wurupong, Ghana

Melissa Murray, Carol King, Cecilia Sorensen, Elaine Bunick, Renee King

University of Kentucky College of Medicine, Rotary Club of Oak Ridge Tennessee, University of Colorado School of Medicine, Aurora, CO, USA

Abstract

Hypertension and other non-communicable diseases are growing risk factors for cardiovascular disease and stroke in low- and middle-income countries like Ghana who are experiencing the effects of rapid urbanization and globalization. Awareness and education may help reduce the population's exposure to modifiable risk-factors. A survey from a central clinic outside the city of Ho, in the Volta region investigates participants' level of awareness and education surrounding hypertension and stroke. It provides important information about the approach to education and preventing modifiable risk factors.

A central clinic in Nkonya-Wurupong, Ghana, evaluated 1671 patients in July 2016, and a group of 302 adults over the age of 18 provided a convenience sampling. The survey examined three main areas: demographics, medical history, and evaluation of knowledge with respect to stroke and cardiovascular risk factors.

18.5% of participants demonstrated hypertension (BP ³ 140/90). 30% of those with hypertension were female. Thirty-five percent believed hypertension was a risk factor for stroke, and only 26% were currently medicated for hypertension. Poor diet, obesity and alcohol were the most frequently identified risk factors for stroke and 86% of participants felt that it was preventable. However, diet, heart disease, smoking, obesity, diabetes, sedentary lifestyle or alcohol were not uniformly identified as stroke risk factors. One-sided weakness was the only symptom the group associated with stroke. Other symptoms included in the survey were headache, slurred speech, visual changes, dizziness, and facial droop. Educational resources included TV, school, internet, radio, medical books and health professionals and 7% responded that they had never been educated about stroke and its risk-factors.

Knowledge of hypertensive consequences including cardiovascular disease and stroke varies significantly along with stroke identification and educational sources. However, many indicated that stroke is due to lifestyle and can be prevented. It is unclear what respondents believe these lifestyle choices are. This data suggests there are major areas where healthcare education is needed. Discerning baseline health in developing countries will become increasingly important when evaluating an area for health resource allocation including patient health education programs.

Introduction

Cardiovascular diseases (CVDs) are the leading cause of death globally.[1] The World Health Organization estimates that if the 17.7 million people who died due to CVDs in 2015, 6.7 million of them were due to stroke. Over 75% of these deaths occur in low- and middle-income countries like Ghana. This trend is likely to grow, and estimates predict that by 2030 about 70% of all deaths worldwide will be due to non-communicable illnesses, with the overwhelming burden continuing to occur in low- and middle-income regions of the world.[2] Sequelae of cardiovascular diseases that occur in the low- and middle-income countries (LMIC) are more likely due to the consequences of uncontrolled or poorly managed hypertension including stroke and heart failure.[3] This differs from higher income countries whose consequences of CVDs are more likely due to ischemic heart disease.[4]

While there has been significant investigation and acknowledgement that access and availability to healthcare factors enormously in overall community health, it remains a multi-faceted problem regarding the approach to rising prevalence of non-communicable diseases (NCDs) in LMICs. Infectious diseases have been healthcare's primary focus in these regions throughout recent decades, and despite the fact that non-communicable diseases are expected to outpace infectious causes of disease in sub-Saharan Africa by 2035, it is unclear to what degree communities are aware of these diseases and their consequences.[5]

This survey provides important information about approach to education in local communities and bringing awareness to modifiable risk-factors. While there have been studies investigating hypertension awareness alone in Africa and Ghana specifically, there is limited information regarding awareness of hypertension and stroke risk factors.[6,7] Thus, the aim of this study was to conduct a community-based, multi-region survey in a health clinic in Nkonya-Wurupong, Ghana, and investigate participants' level of awareness and education surrounding hypertension and stroke.

Correspondence: Renee King, University of Colorado, School of Medicine, 12401 E. 17th Ave. Mail stop B215, Aurora, CO 80045, USA.
Tel.: +1.720.848.5777.
E-mail: Renee.King@ucdenver.edu

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Materials and Methods

A two-week community-based survey was conducted during July 2016, from a central clinic in Nkonya-Wurupong, Ghana. 1671 patients were evaluated, and a group of 302 adults over the age of 18 provided a convenience sampling. Blood pressure recordings were a standard part of the patient visit.

The survey examined three main areas: individual demographics, medical history, and knowledge deficit with respect to stroke and cardiovascular risk factors. Participants were asked a variety of questions including their age and demographics. They were also asked if they had ever been diagnosed with high blood pressure, if they were currently being treated, if they were compliant with that treatment, and were additionally asked questions surrounding their understanding of the consequences of high blood pressure. Participants were asked to identify modifiable risk factors for hypertension and their source of information. Additionally, they were asked to name the symptoms and consequences of stroke.

Two nurses were tasked with providing a standard survey to adult patients that were already in clinic waiting to be seen. Persons who were unable to consent were excluded from the survey. The patients were allowed to answer survey questions but the nurses were available to help with reading and translation when needed. A three-part self-administered questionnaire was used for data collection. The first part recorded demographic information, the second part included medical history. and the third assessed knowledge about hypertension and stroke (Table 1).

In this study, hypertension was defined as any blood pressure ³ 140/90 mmHg, and cardiovascular disease was defined as a pathology affecting the heart and blood vessels.

Approval for this study was obtained from University of Kentucky Institutional Review Board for Human Research.

Results

18.5% of participants demonstrated hypertension (BP ³ 140/90). 30% of those with hypertension were female. 35% believed hypertension was a risk factor for stroke, and only 46% were currently medicated for hypertension (Figure 1). Risk factors most frequently identified were obesity, lack of exercise and alcohol, and 86% of participants reported that stroke was preventable (Figure 2). However, diet, heart disease, smoking, obesity, diabetes, sedentary lifestyle or alcohol were not identified as stroke risk factors. One-sided weakness was the only symptom the group associated with stroke. Other symptoms included in the survey were headache, slurred speech, visual changes, dizziness, and facial droop (Figure 3). It was difficult to discern the sources of participants' information. A few respondents did indicate school, Internet, radio, TV, medical books, or health professionals (Figure 4).

Discussion

Ghana attained low- and middle-income status in 2010, with an increasing economic growth of >7% per year since 2005. Discovery of offshore oil reserves has allowed Ghana to achieve Middle Income status and aids in its consistent per capita growth.[8] As is common, this economic growth has not occurred equally throughout all regions of Ghana. Many gaps including poverty, socioeconomic status and healthcare-related issues have arisen. Indeed, recent studies show that Ghanaians with

Table 1. Survey questionnaire and demographics.

Demographic Features Variable	Frequency	Percent %
Age (mean = 49.9, SD 17.9)		
<50 years	136	44.88
≥ 50 years	167	55.12
Gender		
Male	92	30.36
Female	199	65.68
No response	12	3.96
Religion		
Christian	295	97.36
Traditional	3	0.99
Moslem	5	1.65
Marital Status		
Married	160	52.81
Single	57	18.81
Widowed	41	13.53
Separated	0	0.00
Divorced	13	4.29
No Response		0.00
Highest education attained		
None	66	21.78
Primary	67	22.11
Secondary	142	46.86
Tertiary	27	8.91
Monthly income in Cedis		
<100	38	12.54
100-999	27	8.91
1000-1999	4	1.32
2000-2999	0	0.00
>3000	0	0.00
Not working	129	42.57
Self identified past medical history		
Hypertension	126	41.58
Diabetes	13	4.29
High cholesterol	10	3.30
Prior stroke	9	2.97
Heart disease	48	15.84
Smoking	31	10.23
Alcohol use	72	23.76
Currently taking HTN medication	27	8.91
Knowledge of stroke risk factors and warning signs among study participants **Variable**	**Frequency**	**Percent%**
Risk factors		
Hypertension	106	34.98
Hyperlipidemia	18	5.94
Poor Diet	88	29.04
Heart disease	14	4.62
Smoking	48	15.84
Obesity	69	22.77
Family History	44	14.52
Diabetes	8	2.64
Stress	76	25.08
Lack of Exercise	118	38.94
Alcohol	120	39.60
Don't know	41	13.53
Warning signs		
Numbness on one side	210	69.31
Shortness of breath	26	8.58
Headache	86	28.38
Slurred speech	164	54.13
Pain	4	1.32
Weakness on one side	62	20.46

Continued to the next page.

higher socioeconomic status were more likely to live with a non-communicable disease compared to those with a low socioeconomic status, suggesting that as the trend in globalization increases, the people most affected are those experiencing the largest economic benefit from elevated income.[9] Our study was centered around an area of Nkonya-Wurupong, a community found a short distance from the city of Ho in the Volta region, thus close enough to an urban area as to feel the effects of urbanization and globalization.

While socioeconomic gaps and varying degrees of access to healthcare are acknowledged within Ghana, it is suspected that these gaps are underestimated, and may exist to a larger degree than has previously been measured.[10] This work aims to examine and specifically emphasize the knowledge and education gap in Ghana surrounding the rise of cardiovascular disease, its consequences, and awareness of modifiable risk-factors. Studies have shown that cardiovascular disease can account for approximately 7-10% of all adult medical admissions within Africa, and the numbers are expected to rise.[11] Less than half of the participants in our study identified with hypertension were being treated, and it is unclear if all of those found to have hypertension had been formally diagnosed. Additionally, while many participants in the sample population were able to identify lifestyle as a risk factor for stroke, there was a marked inconsistency in which lifestyle attributes contributed to risk. Participants' cited a wide array of answers with the most prominent being alcohol and lack of exercise. While this is promising, smoking, obesity, hypertension, and hyperlipidemia were less frequently identified. Additionally, when asked to identify signs and symptoms of stroke, inconsistencies and lack of awareness was further accentuated, and highlighted an inability to identify educational resources, demonstrating the existence of an educational gap surrounding non-communicable diseases. This gap exists in addition to the more commonly identified inadequate access to healthcare.[12]

Until recently, infectious disease has largely driven Ghana's approach to healthcare, but there is growing evidence that non-communicable diseases are on the rise, specifically cardiovascular disease, primary hypertension and its sequelae.[8] The World Health Organization attributes increasing burden of cardiac diseases largely to the phenomenon of globalization[13]. This results in increased interconnectedness and interdependence amongst peoples, cultures, and surrounding countries. As Africa makes socioeconomic gains and adopts adverse lifestyle and dietary changes, the burden of ischemic heart disease will undoubtedly grow, placing immeasurable strain on a limited healthcare capacity.[14] These countries will ultimately struggle with the dual burdens, as infectious disease remains a central focus.[3] Our study should serve to emphasize the need for consistent educational resources, their distribution and the need for public health education in Ghana, specifically aimed towards populations feeling the rapidly changing effects of globalization. This is a multifaceted issue and not solely related to individuals' physical access to a physician.

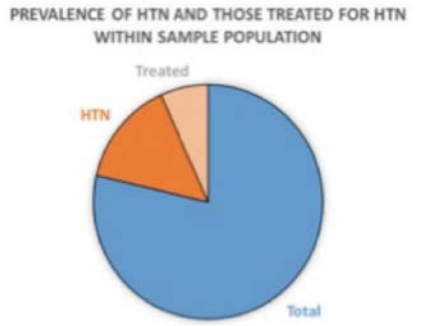

Figure 1. Within the sample population, 18.5% participants demonstrated hypertension with a blood pressure of ≥ 140/90. Of the 18.5%, only 46% of identified as having a diagnosis of hypertension and were currently being treated for hypertension.

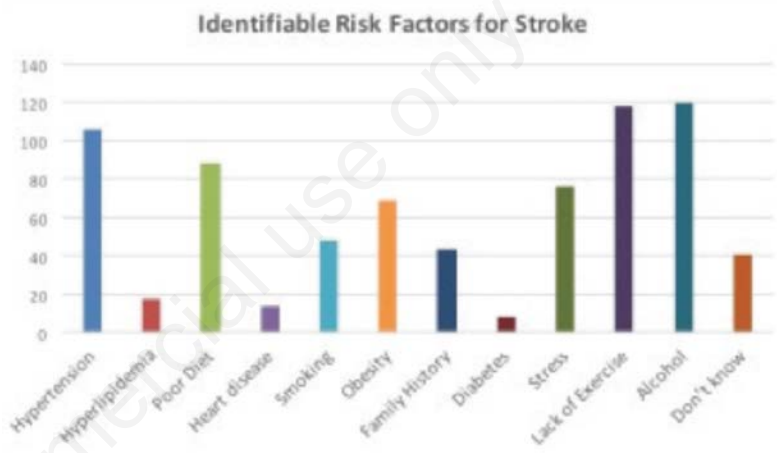

Figure 2. Subjects within the sample population were asked via survey to identify risk factors they associated with stroke. Risk factors including sedentary lifestyle, diet, heart disease, smoking, diabetes and obesity were not as frequently identified as major risk factors for either stroke or high blood pressure.

Table 1. Continued from previous next page.

Demographic Features Variable	Frequency	Percent %
Vision problem	32	10.56
Dizziness	22	7.26
Facial Droop	40	13.20
Don't know	15	4.95
Beliefs		
Stroke is a preventable illness	262	86.47
Lifestyle factors can reduce risk	241	79.54
Stroke only effects the elderly	91	30.03
Is a problem in Ghana	151	49.83
Requires emergent treatment	243	80.20
Is a spiritual illness	100	33.00
Source of information regarding stroke		
Never learned	21	6.93
Internet	9	2.97
Newspaper/Magazine	4	1.32
School	12	3.96
Medical books	5	1.65
Radio	192	63.37
Television	90	29.70
Health Professional	89	29.37

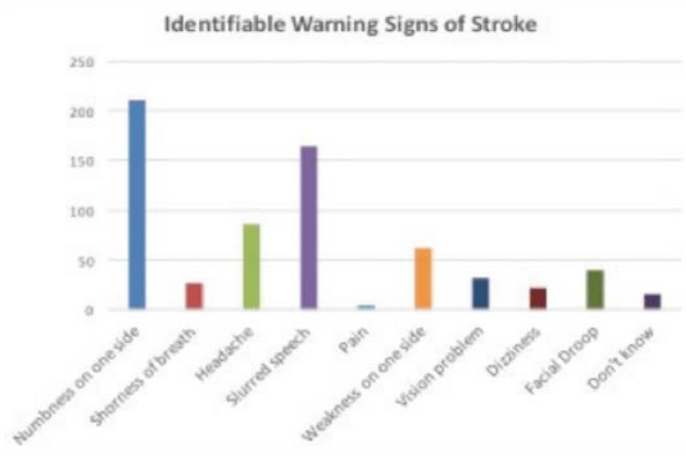

Figure 3. Participants identified one-sided weakness as a stroke symptom, but other symptoms including headache, slurred words, visual changes, dizziness, or facial droop were not identified as stroke symptoms with similar consistency.

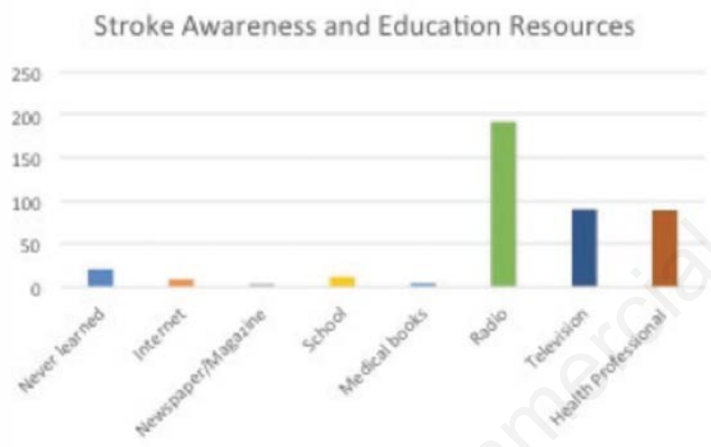

Figure 4. Educational sources were difficult to discern. Participants indicated a wide variety of educational resources including school, Internet, radio, and television.

Conclusions

Knowledge of hypertensive consequences including cardiovascular disease and stroke varies significantly along with the ability to identify the signs and symptoms of stroke. There exists a paucity of educational resources, and individuals are consistently unable to identify the location of the existing resources. However, many indicated that stroke is due to lifestyle and can be prevented, suggesting that the seeds of awareness have been planted. It is unclear what respondents believe these lifestyle choices are. This survey suggests there are major areas where healthcare education is needed. Discerning baseline health in developing countries will become increasingly important when evaluating an area for health resource allocation and including the need for extensive patient health education programs, as well as access to preventive and primary care. Based on the results of his study we plan to develop a training module for the nursing staff at the Nkonya-Wurupong clinic to assist them in providing patient education for hypertension and stroke risk factors.

Table 1 illustrates the demographic of the convenience sampling including age, gender, education and monthly income. Survey questions included knowledge and education surrounding hypertension, stroke, risk factors and recognizable symptoms of stroke.

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