



Co-Occurrence of Systemic Hypertension and Glaucoma in Southeast Nigeria

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ABSTRACT

The co-occurrence of systemic hypertension and glaucoma was investigated in rural communities of southeast Nigeria. Four hundred and forty six subjects were examined of which 186 (41.7%) were males and 260 (58.3%) were females. Three hundred and forty of the subjects had either hypertension, glaucoma or both. From this number, 183 (53.82%) subjects had hypertension, 157 (46.18%) had glaucoma and 106 (31.17%) had both hypertension and glaucoma. Among the subjects with hypertension, 46.99% were males and 53.01% were females. For the subjects with glaucoma, there were 42.04 % males and 57.96% females. For the subjects who had both hypertension and glaucoma, 44.34% were males and 55.66% were females. Proper awareness and health education campaigns toward mitigating the impact of hypertension and glaucoma was recommended.

Keywords:

Hypertension, glaucoma, blood pressure, intra ocular pressure

INTRODUCTION

Hypertension or high blood pressure is a chronic medical condition in which the blood pressure in the arteries is elevated¹. Blood pressure is summarized by two measurements, systolic and diastolic, which depend on whether the heart muscle is contracting (systole) or relaxed between beats (diastole). This equals the maximum and minimum pressure, respectively. Normal blood pressure at rest is within the range of 100–140 mmHg systolic and 60–90 mmHg diastolic. High blood pressure is said to be present if it is often at or above 140/90 mmHg¹. Hypertension is a common health problem with sometimes, devastating consequences, and often remains asymptomatic until late in its course. It is one of the most important risk factors for both coronary artery disease and cerebrovascular accidents. Hypertension can lead to cardiac hypertrophy and, potentially, heart failure (hypertensive heart disease), aortic dissection, and renal failure². It is widely acknowledged that hypertension is a complex, multifactorial disease that has both genetic and environmental determinants². Hypertension is classified as either primary (essential) hypertension or secondary hypertension. About 90–95% of cases



are categorized as primary hypertension which means high blood pressure with no obvious underlying medical cause³. The remaining 5–10% of cases categorized as secondary hypertension is caused by other conditions that affect the kidneys, arteries, heart or endocrine system. Dietary and lifestyle changes can improve blood pressure control and decrease the risk of health complications, although drug treatment is still often necessary in people for whom lifestyle changes are not enough or not effective. The treatment of moderately high arterial blood pressure (defined as >160/100 mmHg) with medications is associated with an improved life expectancy^{4,5}. The benefits of treatment of blood pressure that is between 140/90 mmHg and 160/100 mmHg are less clear, with some reviews finding no benefit^{4,5} and other reviews finding benefit⁶. Hypertension is rarely accompanied by any symptoms, and its identification is usually through screening, or when seeking healthcare for an unrelated problem. A proportion of people with high blood pressure report headaches (particularly at the back of the head and in the morning), as well as lightheadedness, vertigo, tinnitus (buzzing or hissing in the ears), altered vision or fainting episodes⁷. These symptoms, however, might be related to associated anxiety rather than the high blood pressure itself⁸.

Glaucoma is an optic neuropathy associated with characteristic structural damage to the optic nerve and associated visual dysfunction, which are seen clinically as enlargement of the optic disc cup and loss of field of vision⁹. A standard definition and classification system for glaucoma was proposed in 1998 by the International Society of Geographical and Epidemiological Ophthalmology (ISGEO)

principally for use in population-based prevalence⁹. The definition considers glaucoma as a group of diseases defined by end-organ (optic nerve) structural damage and functional deficit. In the ISGEO classification, glaucoma is defined by three levels of evidence, regardless of angle morphology. The highest level of evidence is when both structural damage and functional deficit are seen; that is, a large vertical cup: disc ratio (VCDR) and/or asymmetry between the two eyes. Lately, there has been increased momentum about glaucoma care in Africa. At the World Glaucoma Association 1st Africa glaucoma summit in Ghana in 2010, a decision was made to strengthen and incorporate glaucoma management, training and education into existing programs¹⁰. Glaucoma can be classified into primary open angle glaucoma (POAG) and primary angle closure glaucoma (PACG). Further classifications of glaucoma include secondary glaucoma, normal tension glaucoma, congenital glaucoma and juvenile glaucoma¹¹. Primary open angle glaucoma is the most frequent type of glaucoma occurring in Nigeria^{12,13}. Primary open angle glaucoma is mostly associated with damage caused by intraocular hypertension, which can be delayed by medication, surgery, or laser therapy.

Recent data suggest common mechanisms related to altered epithelial sodium transport in the distal nephron and ciliated epithelium. Excessive renal sodium retention leads to systemic hypertension, and increased ciliary epithelial sodium transport leads to extrusion of sodium into the aqueous humour¹⁴. In both, sodium transport is regulated by corticosteroid hormones (cortisol and aldosterone), and the human ciliary and distal nephron epithelia



express the same effector mechanisms as corticosteroid receptors, pre-receptor metabolising enzymes, and post-receptor ligands to affect sodium reabsorption¹⁴. If increased sodium reabsorption underpinned the occurrence of hypertension and glaucoma, then an epidemiological link between the two is possible. The objective of this study is to observe the co-occurrence of systemic hypertension and glaucoma in southeast Nigeria with a view to determine if the correlation of the two is significant.

MATERIALS AND METHODS

This research was a prospective clinical study carried out in several rural communities of southeast Nigeria between December 2010 and February 2011. Subjects were assembled from neighboring rural communities in two states of the southeast geographical region on Nigeria. An informed consent was obtained from all the subjects used for this study. Examination of subjects involved taking of case history, external examination using pen light, visual acuity test using the Snellen visual acuity chart, retinoscopy with the Keeler retinoscope, ophthalmoscopy with the Keeler ophthalmoscope, indentation tonometry using schoitz tonometer, subjective refraction and visual field test. The blood pressure was taken with the use of KODEA electronic sphygmomanometer. The subjects who had both glaucoma and hypertension were then noted.

RESULTS

Four hundred and forty six subjects were examined of which 186 (41.7%) were males and 260 (58.3%) were females. Out of this number, 340 subjects had either hypertension, glaucoma

or both. From this number, 183 (53.82%) subjects had hypertension, 157 (46.18%) had glaucoma and 106 (31.17%) had both hypertension and glaucoma. This is shown in figure 1. The gender distribution of hypertension is shown in figure 2 with 46.99% males and 53.01% females. The gender distribution of glaucoma showed 42.04 % males and 57.96% females (figure 3). For subjects who had both hypertension and glaucoma, 44.34% were males while 55.66% were females (figure 4).

DISCUSSION

Hypertension and glaucoma are two health problems that are quite common among the older population^{15,16}. The fact that they tend to co-exist among many patients is not a matter of chance. Mechanisms in sodium transport at receptors in ciliary and renal tubular epithelia are thought to be responsible for this¹⁷. The high level of stress and anxiety among Nigerians seem to contribute to the prevalence of hypertension¹⁶. A five-day free hypertension screening for Lagos State residents in Nigeria organized by the Lagos State government, in collaboration with the Ministry of Health and the local councils aimed at reducing the number of deaths from the diseases by sensitizing the public about the importance of regular check-up and early detection was carried out in Lagos State Nigeria¹⁸. The program created awareness on the dangers of hypertension and diabetes and afforded people the opportunity to check their health status. A lot of factors can be found to be responsible for the high level of hypertension in rural areas of Nigeria. The level of stress and tension is high in the communities. This could be attributed to poverty, as many of the people cannot afford to put three square meals on the



table. They cannot afford to live in a decent accommodation and they cannot afford the basic necessities of life. A good number of the elderly are pensioners who cry that they are being owed arrears of their pension. This has brought a lot of misery and frustration to them as they have no other means of sustaining themselves.

Glaucoma on the hand is recognized as an important cause of blindness. This is justified, because it is the second leading cause of blindness worldwide (after cataract), and is responsible for about a third of people who are blind¹⁹⁻²¹. The disease affects an estimated 67 million people globally^{19,22}. Although glaucoma cannot be cured, it is controllable, but once the visual field is lost it can never be regained^{23,24}. In a community-based study of rural patients in the same area of southwestern Nigeria, glaucoma accounted for 21.1% of eye problems, and was also responsible for a third of cases of blindness²⁵. Glaucoma undoubtedly puts significant stress on family finances. Cost of illness studies have shown that glaucoma is very important because direct medical costs are significant, with direct and indirect nonmedical costs also being very considerable^{26,27}. This in turn has caused noncompliance on the part of patients, particularly among those on "modern" topical medication which are more expensive, especially with multiple schedules, leading to a vicious circle which ultimately worsens the visual outcome. The current move from first-line surgical treatment to newer, more potent, better tolerated, but more expensive topical medications is another factor leading to noncompliance, particularly when patients, for various economic reasons, can no longer continue to pay for their treatment. The indirect costs of the repeat visits necessary for

intraocular pressure checks have also been implicated.

Treatment costs are directly related to disease severity and number of treatments used, and most Nigerians are living below the poverty line. In this region, patients find it difficult to maintain compliance with the treatment modalities for both hypertension and glaucoma, and the economic challenges involved may be contributory. Studies have shown that cost of treatment have contributed to the high prevalence of morbidity in developing countries²⁸⁻³¹. Most of these patients resort to folk medication or other cheaper forms of treatment which in most cases does not improve their condition, rather complicates it the more. Patients with hypertension and glaucoma must ensure that they monitor and control their blood pressure and intraocular pressure to prevent blindness and other complications such as stroke. Proper awareness programs and health education campaigns should be intensified in rural areas to mitigate the impact of hypertension and glaucoma.

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FIGURES

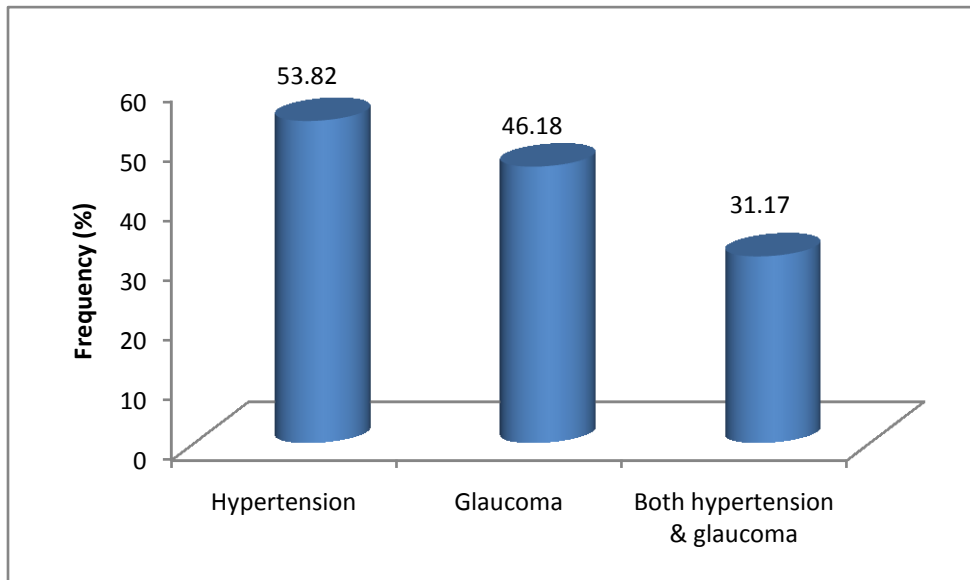


Figure 1: Distribution of hypertension and glaucoma among subjects

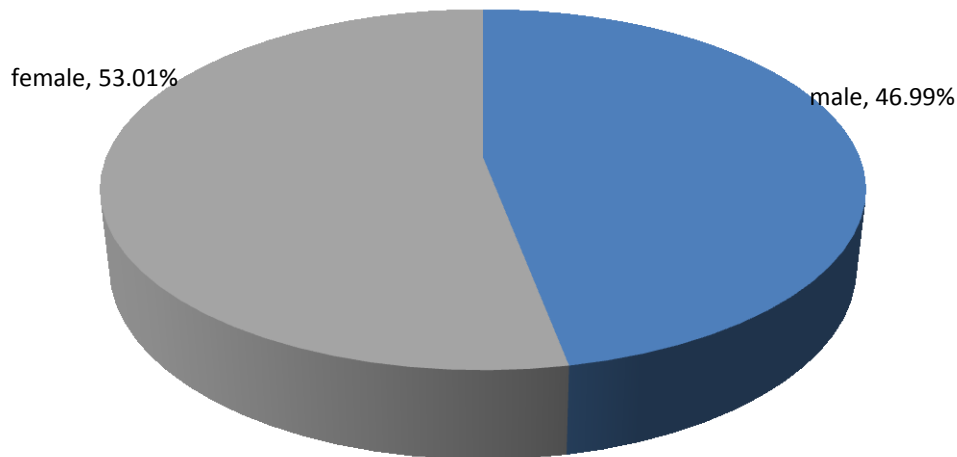


Figure 2: Gender distribution of subjects with hypertension

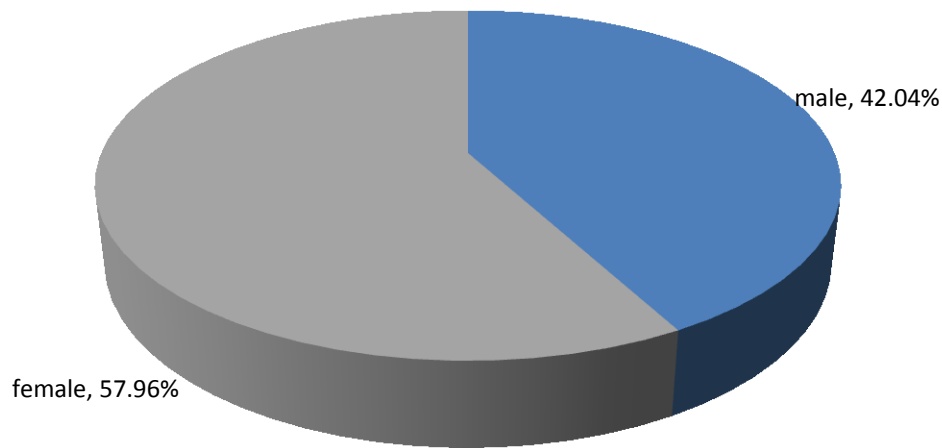


Figure 3: Gender distribution of subjects with glaucoma

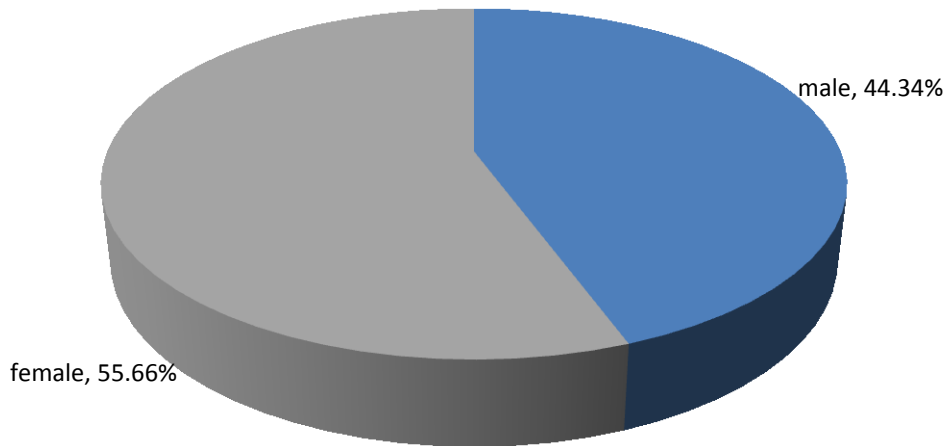


Figure 4: Gender distribution of subjects with both hypertension and glaucoma