



Ethnobotanical Survey Of Antihypertensive Agents In Sokoto, Northwest Nigeria

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Abstract:

*The study was undertaken to obtain an inventory of the medicinal plants used in traditional medicine to treat hypertension. A total of forty respondents were interviewed of which 65% were males and 35% were females. This population comprised of traditional medical practitioners (45%) and herbal sellers (55%). They were interviewed using semi-structured questionnaires and open-ended conversations. The inventory of the medicinal plants is summarized in a synoptic table, which contains the scientific name, local name (Hausa or Yoruba), frequency of citation, the plant part used and literature references on antihypertensive property. The families of the species were also documented. The study indicated 34 plants belonging to 30 families, some of whose antihypertensive property have been validated in literature. The plants frequently included in antihypertensive recipes were *Allium sativum*, *Oleo europaea*, *Commiphora krestiggi*, *Moringa oleifera*, *Acacia linotica* and *Hibiscus sabdarifa*. The leaf (62.85%) represented the dominant morphological part used.*

In conclusion a large number of medicinal plants are used in Sokoto in the treatment of hypertension some of which have been validated in literature.

Key words: *Ethnobotanical survey, antihypertensive, herbs.*

1.Introduction

Ethnobotany is the study of how communities of particular region employ indigenous plants for food, clothing, medicine and other activities (Aiyeloja and Bello, 2006), the documentation of which is crucial for the conservation and utilization of biological resources (Muthu et al.,2006). 2011). A vast majority of prescription drugs used in the world contain compounds that are directly or indirectly, via semi-synthesis, derived from plants (Oksman-Caldentey and Inze , 2004). Even the synthetic drugs and compounds used in modern times owe their active chemical compound to a bioactive compound in a plant, which has been identified and then copied (Rates, 2001). Thus, plants continue to be a very important resource for new medicines and beneficial compounds. The World Health Organization (WHO, 2002) estimates that 80% of the world's population relies on traditional healing modalities and herbs. Sofowora (1982) reported that Africa has as much as three hundred thousand medicinal plants.

The word hypertension is defined as persistence increase in systemic arterial blood pressure (K Sembulingam and Prema Sembuligam, 2006). Clinically, when the systolic pressure remains elevated above 140mmHg and diastolic pressure remains elevated above 90mmHg, it is considered as hypertension. The prevalence varies with age, race, education, and many other variables (Benowitz, 2009). According to some studies, 60-80% of both men and women will develop hypertension by age 80 (Benowitz, 2009). In Nigeria for example, the true incidence of hypertension remains unknown but its prevalence among male and female is estimated to be 11.2% with age adjusted figure of 9.3%. This translates into approximately 13.4 million Nigerians hypertensive age 15years and above, using the projected national population census figure of 120million (Akinkungbe, 1998). In fact, hypertension is reported to be next to malaria as most serious health problems in developing tropical countries (Agunwa, 1988). Thus the need to control hypertension becomes very imperative, as its complications are associated with high mortality and morbidity. In the last three decades, a lot of concerted efforts have been channelled into researching into local plants with hypotensive and antihypertensive therapeutic values. The hypotensive and antihypertensive effects of some of these medicinal plants have been validated and others disproved (Ajayi et al., 1987).

Therefore this study aimed at documenting ethnobotanical potentials, mainly antihypertensive activity of common herbs in Sokoto Nigeria and providing comprehensive details to back up their antihypertensive potential based on the

information obtained during the survey such as frequency of citation, plant part used and literature references on antihypertensive property.

2.Methodology

2.1.Study Area

The study was carried in Sokoto, located in the North West region of Nigeria. Sokoto state has co-ordinates of: 13005'N 05⁰15'E., covering an area of 25,973 km² (10,028 sq mi) with 23 local government areas (Figure 1). Ethno botanical information was sort among herb sellers in the markets and traditional medicine practitioners in Sokoto State metropolis.

2.2.Ethnobotanical Survey

The survey was conducted from 5th of December, 2012 to 5th of January, 2013.

Traditional medical practitioners (TMPs) and herbal medicine sellers who were the informants were interviewed using semi-structured questionnaires and open - ended conversations. A total of 40 questionnaires were administered to both the TMPs and herbal medicine sellers. The interview and the discussions were carried out in the local languages of the respondents (Yoruba and Hausa) since the author speaks both languages. Socio demographic data (name, age, tribe, sex etc.), data on local names, plants part used, mode of usage or administration were collected on the field.

3.Result

3.1.Socio Demographic Data

A total of 40 key informants were interviewed consisting of 18 Traditional medicine practitioners (TMPs) and 22 herbal sellers .The age of the respondent ranged between 30 to 70 years with the mean age being 47 years. Majority of the informant were males 26 (65%) while the females were 14 (35%). Of these informants 7 (17.5%) were secretive about the names of the plant species that they use for the treatment of hypertension. Hence the list of plant species was given by 33 informants. The result on socio demographic data is as presented in Table 1.

3.2. Antihypertensive Herbs Used In Sokoto

In the present study, a total of 34 species belonging to 30 families were mentioned by 33 informants and is presented in Table 2. Some of the herbs mentioned are used as single agent while some are used in combination as shown in Table 3

4. Discussion

Ethno botany is perhaps the most important method to study natural resource and their management by indigenous people. It enable us to work with local people to explore knowledge based on experiences and ages . The advanced age of some of the respondents in this study has been corroborated by other survey (Adeyemi et al., 2010 and Ogbole et al., 2010). The sex of respondents in this survey indicates that 65 % of the respondents were male while 35 % were female. This may be due to the fact that in this part of the country, females are restricted to certain kind of job that hardly takes them out of their household. Almost half of the respondents have had over 10 years of experience in treating hypertension; it may be assumed that the information provided by them is genuine and reliable. As high as 50 years of experience was recorded in similar survey in Ilugun in South West Nigeria by Lawal et al., (2009).

The percentage of Muslim respondents is higher than that of the Christian respondents (87.5% Muslim and 12.5 % Christian). This is because Sokoto is known to be a Muslim practicing state with little percentage of Christians around.

The multi-component nature of some of the recipes in this study is known for other traditional medicines (Lawal et al 2009, Adeyemi et al 2010) and is believed to improve efficacy through synergism. Leaf, as in this study, appears to be a popular plant part in the preparation of herbal recipes. This has been corroborated by other studies (Mishra, 2011; Offiah et al.,2011 and Onge et al., 2011). The survey carried out highlighted the use of 34 species belonging to 30 families. In a similar study Tahraoui et al.(2007) in Morroco identified 64 medicinal plant belonging to 33 families , while Ziyat et al.(1997) and Gbolade (2009) recorded 41 plant belonging to 36 families and 49 plants belonging to 33 families , respectively .

The antihypertensive property of some species reported in this study (42.9%) has been validated in literature. This may be a pointer to the experience of the informants in this study.

Considering the relatively high frequencies for, *Allium sativum*, *Oleo Europaea commiphora krestigii*, *Moringa Oleifera*, *Acacia linotica*, and *Hisbiscus sabdarifa*, it is

believed that recipes containing these plants are more commonly dispensed within the state. Osamor and Owumi (2010) have documented garlic (*Allium sativum*) as the most popular herbal recipe among the hypertensive patients in Ibadan, an urban community in south west Nigeria. A recent dimension is the reported incidence of co-administration of herbal medicines with orthodox antihypertensive agents by 47.5% hypertensive respondents at a secondary health care facility in Maiduguri, north east Nigeria (Olisa and Oyelola, 2009) who are unaware of possible drug–drug interactions.

Ajibesin et al .(2008) reported hypertension as one of the major diseases in an ethnobotanical survey of Akwa Ibom State in south east Nigeria, and listed *Persea americana*, *Allium sativum* and *Zingiber officinale* as prominent plants in its treatment. In a related survey in neighbouring Togo ,two principal Nigerian plants, *Persea americana* and *Allium sativum*, and two others (*Parkia biglobosa* and *Khaya senegalensis*) were documented as effective antihypertensive recipes (Karou et al.,2011). Furthermore, four plants, *Persea Americana*, *Carica papaya*, *Hibiscus sabdariffa* and *Aloe vera* which are commonly included in Nigerian herbal recipes were also reported by Lans (2006) in the ethno botanical survey of Trinidad and Tobago.

The secrecy of 17.5% of the informants about the name of herbs shows their fear toward losing their source of income as this may have the aftermath of shifting patients focus from them to others. Efforts need to be made by government to integrate herbal practice and protect the intellectual knowledge of practitioners.

The survey shows that a large number of medicinal plants are used in Sokoto state to treat hypertension. This knowledge of traditional medicine remains mostly with the traditional medical practitioners who are getting old. The local population should be educated on sustainable methods of harvesting plants to treat diseases today without compromising their availability for future use. The government should demonstrate appropriate political will by not only formally recognizing the practice of traditional medicine, but also to establish traditional medical institutions and provide scholarships for interested persons.

5.Recommendation

It is recommended that screening of the above mentioned plants whose antihypertensive property are yet to be validated be subjected to scientific testing in order to justify their local usage. These studies might lead to the isolation (and possibly the identification) of

potentially active compounds, which may be regarded as future promising phyto-therapeutics in the treatment of hypertension

Parameters	Specification	N(%)
Practice specification	Herbal sellers	22(55)
	Traditional medicine practitioner	18(45)
Sex	Male	26(65)
	Female	14(35)
Age(yrs)	<30	0(0)
	31-40	13(32.5)
	41-50	12(30)
	51-60	10(25)
	61-70	5(12.5)
Religion	Islam	35(87.5)
	Christian	5(12.5)
Duration of practice	1-10	12(30)
	11-20	16(40)
	21-30	9(22.5)
	31-40	2(5)
	41-50	1(2.5)

Table 1: Socio Demographic data of the Respondents

N= Number of respondent

%= Percentage

Botanical name	Local name	Family	Frequency of citation	Part used	Literature references on antihypertensive property
Hisbiscus sabdarifa	Sobo(H)	Malvacea	2	Leaves	Adegunloye et al.,(1996)
Allium sativum	Alubosa Ayu(Y)	Liliaceae	5	Bulb	Silogy,(1994)
Cassie occidentalis	Ako ire(Y)	Caesalpini aceae	1	Leaves	Ajagbonna et al.,(2001)
Phyllanthes amarus	Ewe alabo(Y)	eurphobiac eae	1	Leaves	Srividyaand Periwal(1995)
Allium ramsoms	Ayu ibile(Y)	Liliaceae	1	Bulb	Zhao (1992)
Gloriosa superba	Orin Ota(Y)	Colchicace ae	1	Leaves	None found
Commiphora Krestii	Ararrabi(H)	Burseracea e	2	Stem	None found
Tacca involucrata	Habatunsauda (H)	Dioscoreac eae	1	Leaves	None found
Crataegus species	Zarangadee(H)	Rosaceae	1	Fruits	Potter, . et al.,(2007)
Vitex dodiana	Oori-nla(Y)	Verbenace ae	1	Leaves	Ladeji et al(1996)
Oleo europaea	Zeitun(H)	Oleaceae	3	Leaves	Susalit et al.,(2011)
Englerina gabonensis	Kauci(H)	Loranthace ae	1	Leaves	Susalit et al.,(2011)
Persea Americana mill	Eyin olobe(Y)	Lauraceae	1	Stem	Adeboye et al.,(1999)
Newbouldia leavis	Akoko(Y)	Bignoniace a	1	Leaves	None found
Linium usitissimum	Asan(Y)	Linaceae	1	Leaves	None found
Zingiber officinal	Ata ile (Y)	Zingiberac eae	1	Rhizom es	Nabeel and Hassan (2005)
Vernonia amygdalina	Ewuro(Y)	Asteraceae	1	Leaves	Lawal et al., 2010
Rhapteopetalum coriaceum	Semi lowos(Y)	scytopetala ceae	1	Stem	None found
Pyrus specie	Ewe pear (Y)	Rosaceae	1	Leaves	None found
Aframomum melegueta	Ataire(Y)	Zingiberac eae	1	Seeds	None found
Aloe buettneri	Alofera(H)	Xanthorrh eaceae	1	Leaves	None found

Botanical name	Local name	Family	Frequency of citation	Part used	Literature references on antihypertensive property
Carica papaya	Ibepe(Y)	Caricaceae	1	Leaves	Lohiya et al (2006)
Catharanthus roseus	Apabida pupa(Y)	Apocyanaceae	1	Leaves	None found
Kigelia africana	Pandoro(Y)	Bignoniaceae	1	Fruits	None found
Cocos nucifera	Agbon(Y)	Aracaceae	1	Leaves	None found
Prosopis Africana	Kiriya(H)	Pabaceae	1	Leaves	Girish et al.,(2011)
Solanum lycopersicum	Timoti(Y)	Solanaceae	1	Fruits	Nguelefack-Mbuyoa et al al (2008)
Psidium Specie	Gwaba(H)	Myrtaceae	1	Fruits	None found
Acacia linotica	Bagaruwa(H)	Pabaceae	2	Leaves	Nacoulma-ouedraogo,1996
Butryosperm paradozeum	Ori(Y)	Sapotaceae	1	Leaves	Nacoulma--ouedraogo,1996
Corchorus olitorious	Ewedu(Y)	Tiliaceae	1	Seeds	None found

Table 2: List Of Medicinal Plant Used In The Management Of Hypertension By Tmps And Vendors In Sokoto State, Northwest Nigeria

Y = Yoruba Name

H = Hausa Name

Serial number	Name of plant No(1)	Name of plant No (2)
Recipe 1	Oleo europaea	Tacca involucrate
Recipe 2	Allium sativum	Solanum lycopersicum
Recipe 3	Euglerina gabonesis	Gloriosa superb

Table 3: Antihypertensive herbs used in combination by traditional medicine healers and herbal vendors in Sokoto, Northwest Nigeria

Family	Number of species
Malvaceae	1
Liliaceae	2
Cecroeariaceae	1
Caesalpiniaceae	1
Eurphobiaceae	1
Colchicaceae	1
Burseraceae	1
Dioscoreaceae	1
Rosaceae	2
Verbenaceae	1
Oleaceae	1
Loranthaceae	1
Lauraceae	1
Bignoniaceae	2
Linaceae	1
Zingiberaceae	2
Onagraceae	1
Anacardiaceae	1
Asteraceae	1
Scytopetalaceae	1
Xanthorrhoeaceae	1
Moringaceae	1
Caricaceae	1
Tiliaceae	1
Aracaceae	1
Papaceae	2
Solanaceae	1
Myrtaceae	1
Sapotaceae	1
Apocyanaceae	1

Table 4: Medicinal plant distribution according to families

Plant part	Frequency
Root	0
Stem	2
Root bark	0
Stem bark	2
Leaves	22
Seeds	2
Fruits	4
Bulb	2
Flower	0
Rhizome	1

Table 5: Frequency Of Plant Part Used



Figure 1: Map of Sokoto and its location in Nigeria

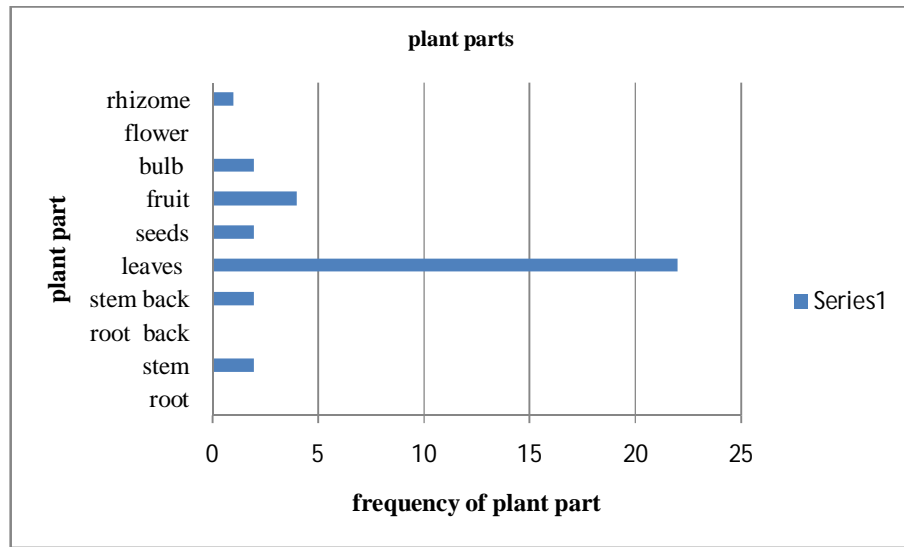


Figure 2: The figure above represents the frequency of the plant parts used by the informants on a bar chart

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