

Nwaiwu O  
Oyelade OB

## Traditional herbal medicines used in neonates and infants less than six months old in Lagos Nigeria

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Nwaiwu O (✉)  
Oyelade OB  
Department of Pharmacology,  
Therapeutics and Toxicology,  
Faculty of Basic Medical Science,  
College of Medicine of the University  
of Lagos, Lagos Nigeria.  
Email: obiyo\_nwaiwu@yahoo.com,  
onwaiwu@unilag.edu.ng

**Abstract:** *Background:* Herbal medicine use in children, adults and other groups have been documented but little information is known about the use of herbal medicine mixtures in neonates and infants less than six months old. This is important because pharmacokinetics and pharmacodynamics changes between infants and adults may result in age-related differences in drug metabolism. This study was carried out to document the herbal medicines used for common ailments in neonates and infants less than six months in Lagos, Nigeria. *Methods:* With the aid of questionnaires and personal interviews during field trips to herbal medicine markets and infant welfare clinics a survey was undertaken to collect information on herbal medicine use by neonates and infants less than six months from traditional healers and nursing mothers during July and September 2014. Demographic information and types of herbal medicines used by the respondents, indications for their use and adverse effects of the herbal medicines they used were obtained.

*Results:* Medicinal plant species used for the treatment of common ailments including diarrhea, abdominal cramps, skin rashes, Fever (malaria), jaundice, convulsions, Insomnia and weight loss in neonates and infants less than 6 months were documented.

A high percentage of the mothers (72%) agreed they used herbal medicines in neonates and infants, although 96% of them did not notice any adverse effect while 100% of the mothers perceived the herbs to be efficacious. Herbal medicines are administered as a polyherbal compound, containing 4-6 plants

*Conclusion:* The use of herbal medicines is common amongst neonates and infants less than six months old. Further studies on the efficacy and safety of these medicines which are administered as polyherbal mixtures is recommended.

**Keywords:** Herbal medicine sellers, Nursing mothers, Herbal medicines, Neonates, Infants less than 6 months, Ethno botanical survey.

### Introduction

Many complementary and alternative therapies, such as herbal remedies, are used in many parts of the world<sup>1</sup>. Plants constitute good therapeutic agents for human diseases<sup>2</sup> and are available without prescription or prescribed by herbal practitioners. With increasing challenges of drug resistance, affordability and availability of good quality, safe and effective medicines, herbal medicines have become very important in our health care system as an option.<sup>3</sup> Use of herbal medicine globally and amongst Nigerians is well documented. Studies have documented herbal medicine use in adults<sup>4</sup>, cancer patients<sup>5</sup>, presurgical patients or day case anaesthesia<sup>6</sup>, asthma patients<sup>7</sup>, hypertensive and diabetic patients<sup>8,9</sup>, pregnant

women<sup>10</sup>, breastfeeding children<sup>11</sup>, children with chronic health conditions<sup>12</sup>, the paediatric age group in general,<sup>13,14</sup> medical inpatients, outpatients, HIV patients,<sup>15</sup> and the general population<sup>16,17,18</sup>.

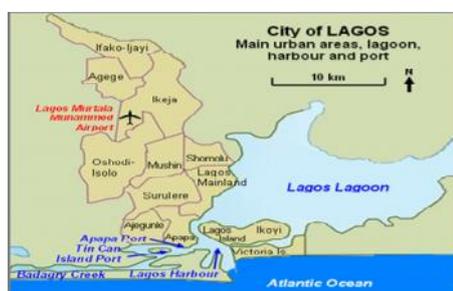
However, no studies have focused on the use of herbal medicine among the neonates and infants less than 6 months. These patients are specially affected because they are also exposed if their mothers take herbs. Like conventional medicines the circulating constituents of herbal medicines in the maternal blood stream are transferred into human breast milk.<sup>19</sup> Anatomical, physiological and biochemical changes that occur from birth affect pharmacokinetics/pharmacodynamics and therefore the bioavailability of drugs. Immaturity of glomerular filtration, renal tubular secretion and tubular reabsorption at birth and their

maturation determine the different excretion of drugs in the neonate.<sup>19</sup> Identification of the types of herbal medicines used in this age group and their indications is important as it adds to existing knowledge and is a useful database for future scientific studies on the scientific basis for the use of herbal medicines in the very young infant. The objective of this study is to document the use of herbal medicines in neonates and infants less than six months old in Lagos Nigeria.

## Methods

The study was done in Lagos metropolis. Lagos is located in South West Nigeria. Lagos has a tropical wet and dry climate and experiences two rainy seasons, with the heaviest rains falling from April to July and a weaker rainy season in October and November.<sup>20,21</sup>

**Fig 1:** City of Lagos<sup>20,21</sup>



### *Ethnobotanical survey, sampling technique and data collection*

Data was collected from July 2014-September 2014. Herb sellers (aka "ELEWE OMO" by Yoruba) from Itire, Aguda, Mushin and Oyingbo markets in Lagos Metropolis were randomly selected by convenient sampling and visited. A total of 30 questionnaires were administered to the herbal medicine sellers. A second survey involved nursing mothers with neonates and infants less than 6 months old attending mother and child care clinic in Massey Street children Hospital and Randle General Hospital in Lagos state. One hundred nursing mothers were selected randomly and interviewed. Demographic data (educational levels and age of children), common illnesses among infants less than 6 months and neonates for which herbs are prescribed, types of herbal plants, duration of treatment, perception of efficacy, perception of safety and occurrence of adverse events were discussed and documented. Discussions were held in English and local Yoruba language. Voucher specimens were collected from the herbal sellers and identified at the Department of Botany University of Lagos.

### *Ethical considerations*

The proposal was submitted to the research and ethic committee of Lagos University Teaching Hospital and an exemption from review was obtained. Informed consent was also obtained from the herb sellers and nursing mothers before administration of the question-

naire. Permission to visit hospitals was obtained from the Lagos State Health Service Commission.

### *Data analysis*

Data is presented as frequency tables and a bar chart.

## Results

A total of 30 questionnaires were administered to the herbal sellers in the markets: Itire, Mushin, Oyingbo and Aguda in Lagos metropolis. Herb sellers were knowledgeable about local morbidity patterns in neonates and infants and the herbal medicines used in the treatment of such ailments. Questionnaires were distributed to 100 nursing mothers but only 78 of them responded. Majority of the herb sellers and nursing mothers had secondary education (Tables 1&2). Children of twelve percent (9) of the nursing mothers were neonates. (Fig 2) The herbal medicines are administered as a polyherbal compound, containing 4-6 plants

**Table 1:** Educational levels of the herbs sellers

Level of Education of herbal sellers	Number	Percentage
No education	4	13.3
Primary	7	23
Secondary	16	53.3
Tertiary	3	10
Total	30	100

**Table 2:** Educational levels of the nursing mothers

Level of Education of herbal sellers	Number	Percentage
No education	20	26
Primary	10	13
Secondary	28	35
Tertiary	20	26
Total	78	100

**Fig 2:** Age of children of nursing mothers

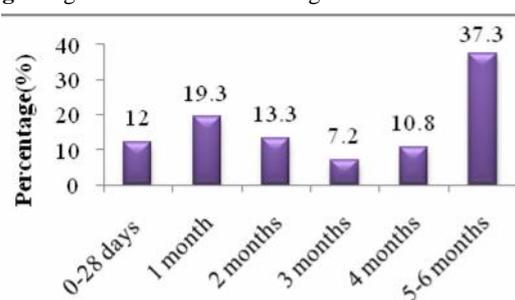


Table 3 shows herbal Remedies used in infants and neonates. The list shows a list of plant species used as herbal mixtures in the Lagos area, presented by family and genera and parts of the plant used.

**Table 3:** Herbal plant mixtures used in neonates and infants less than 6 months old.

Abdominal spasms (spasmolytic herbal plant mixtures)				
Botanical name	Family	Common name	Local name	Part used
<i>Aristolochia albidula</i>	Aristolochiaceae	Dutchman's pipe	Paranfunfun	stem, root
<i>Cryptolepis sanguinolenta</i>	Apocynaceae	Nibima	Paran pupa	stem, root
<i>Aliumascalonicum</i>	Liliaceae	Spring onion	Alubosaelewe	Leaves, Bulb
<i>Calliandra haematocephala</i>	Leguminosae	Corpse awakener	Tude	Leaves, Twigs, Roots
<i>Eugenia aromatic</i>	Myrtaceae	Clove	Kanafuru	Flower

#### Anti convulsant herbal plant mixtures

Botanical name	Family	Common name	Local name	Part used
<i>Crinum glaucum</i>	Amaryllidaceae	Crinum lily	Isumeri	Bulb, Flower stalk
<i>Oxalyscorpoides</i>	Olacaceae		Egboifon	Roots, stem, bark
<i>Aliumascalonicum</i>	Liliaceae	Spring onion	Alubosaelewe	Leaves, Bulb
<i>Tetrapleura tetrapteris</i>	Leguminosae	Aidan	Aridan	Bark, Pod
<i>Croton lobatus</i>	Euphorbiaceae	Cascarilla	Eru	Root, Bark, Leaves

#### Antidiarrhoea herbal plant mixtures

Botanical name	Family	Common name	Local name	Part used
<i>Senna fistula</i>	Leguminosae	Indian laburnum	Aidantoro	Pods, Leaves
<i>Gongronema latifolium</i>	Asclepiadaceae	Amaranth globe	Madumaro, Utazi	leaves
<i>Cryptolepis sanguinolenta</i>	Asclepiadaceae	Jamaican climbing fern	Paran pupa	stem, Root
<i>Aristolochia albidula</i>	Aristolochiaceae	Dutchman's pipe	Paranfunfun	stem, root
<i>Bidens pilosa</i>	Compositae	Spanish needle	Abeere	Flowers, leaves
<i>Eugenia aromatic</i>	Myrtaceae	Clove	Kanafuru	Flower
<i>Rauwolfia vomitoria</i>	Apocynaceae	Jamaican dogwood	Epoorira	Bark
<i>Aristolochia ringens</i>	Aristolochiaceae	Dutchman's pipe	Akogun	Stem, root
<i>Aliumascalonicum</i>	Liliaceae	Spring onion	Alubosaelewe	Leaves, Bulb
<i>Pteleiopsis suberosa</i>	Combretaceae		Epookuku	Bark
<i>Pseudocedrela kotschy</i>	Meliaceae	Dry cedar	Emi gbe-giri	Leaves
<i>Senna fistula</i>	Leguminosae	Indian laburnum	Aidantoro	Leaves
<i>Anthocleista djallonensis</i>	Loganiaceae	cabbage tree	Egbosapo	Bark, leaves
<i>Alstonia boonei</i>	Apocynaceae	Stool wool	Ahun	Bark

#### Herbal plant mixtures for skin diseases

Botanical name	Family	Common name	Local name	Part used
<i>Khayaivorensis</i>	Meliaceae	Red mahogany	oganwo	Bark
<i>Daniellia</i>	Leguminosae	African balsam	Iya	Leaves
<i>Khayaivorensis</i>	Meliaceae	Mahogany	Mahogany	Stem, root, bark
<i>Echinops longifolius</i>	Compositae		Iregbe	Root
<i>Detarium microcarpum</i>	Leguminosae	Sweet detar	Ogbogbo	Bark

#### Herbal plant mixtures for hotness of the body:(anti malaria)

Botanical name	Family	Common name	Local name	Part used
<i>Alstonia boonei</i>	Apocynaceae	Stool wool	Ahun	Bark
<i>Alium cepa</i>	Liliaceae	White onion	Alubosa funfun	Bulb, leaves
<i>Enanthia chlorantha</i>	Annonaceae	African yellow wood	Awopa	Bark
<i>Curcuma longa</i>	Zingiberaceae	Turmeric	Atale pupa	Rhizome
<i>Citrus aurantiifolia</i>	Rutaceae	Lime	Osanwe	Leaves, stem, fruit
<i>Khayaivorensis</i>	Meliaceae	Red mahogany	Epoooganwo	Bark
<i>Nuclea latifolia</i>	Rubiaceae	African peach tree	Egboegbesi	Bark, stem, root
<i>Ananas cosmos</i>	Bromeliaceae	Pineapple	Pineapple	Fruit
<i>Citrus paradise</i>	---	---	Grape	Fruit
<i>Axonopus compressus</i>	Poaceae	Tropical carpet grass	Idi	Leaves

#### Herbal plant mixtures for treatment of yellowness of skin and eyes (neonatal jaundice)

Botanical name	Family	Common name	Local name	Part used
<i>Carica Papaya</i>	Caricaceae	Pawpaw	Ibepe	Fruit
<i>Alium cepa</i>	Liliaceae	White Onion	Alubosa funfun	Bulb
<i>Alstonia boonei</i>	Apocynaceae	Stool Wool	Ahun	Root, Bark, Leaves

Amongst the Nursing mothers, a high percentage of the mothers (72%) agreed they used herbal medicines in neonates and infants, while 100% of the mothers perceived the herbs to be efficacious. Most of the women (96%) did not report any adverse outcomes with herbal medicines on their neonates and infants while 4% of them reported vomiting as a common adverse outcome.

Table 4 shows the indications for herbal medicines and duration of treatment.

**Table 4:** Herbal medicine sellers indications and duration of treatment for herbal medicines in neonates and infants less than 6 months

Indications for herbal medicines	No of herbal sellers who sell herbal medicines for the indications	Percentage (%)	Duration of treatment
Anti Diarrhea	30	100	1 week
Abdominal cramps	26	87	1 week
Skin rashes	20	67	>2 weeks
Malaria (Fever)	7	23	1-3 days
Jaundice	6	20	2 weeks
Spasms / convulsions	5	17	>2 weeks
Insomnia	3	10	1-3 days
Weight gain	3	10	>2 weeks

## Discussion

The present study shows that there is acceptance and use of traditional medicine in neonates and infants less than 6 months old. Information was

obtained from both herb sellers and nursing mothers. This is important because traditional herbalists in Nigeria use various herbal preparations to treat various types of ailments, including diarrhea, cough, convulsions, skin diseases and others<sup>22</sup> and women are major caregivers and their knowledge of herbal medicine has been shown to have positive effects on child health outcomes<sup>23-27</sup>.

In this study, both herb sellers and participating nursing mothers had different levels of education. A large number of the participants had secondary and tertiary education. Previous studies had shown that there was no statistically significant effect of respondents' levels of education on their use of herbal medicines<sup>18</sup>.

The morbidity and mortality pattern in children vary with age. In this study, the indications for which herbal medicines were prescribed are similar to the published morbidity patterns in neonates and very young infants. In infants and children malaria presenting as fever is an important cause of morbidity and mortality. Bacterial infections, in particular pneumonia, gastroenteritis, meningitis and tuberculosis, respiratory tract infection, diarrhoeal disease skin rash, are also important diseases. Amongst neonates the major indications for admission include infections, sepsis, jaundice, low birth weight, tetanus, birth asphyxia and prematurity<sup>28-37</sup>.

Herbal medicines have been used either alone or in combination with conventional medicines and other herbal medicines. Polyherbal mixtures locally called 'Agbojedi-jedi', 'agbo-iba', have been used and documented in our setting<sup>18</sup>. The data on herbal medicines obtained in this study contain herbs already identified in previous documentations, as useful herbal remedies in Nigeria<sup>38-46</sup>.

The efficacy of some of these plants have been confirmed. For example the anti malarial activity of aqueous extract of stem bark of *Enantiachlorantha* has been investigated in *Plasmodium Berghi* infected mice. It has potent antimalarial activities comparable to that of chloroquine<sup>47</sup> and the stem bark of *E. chlorantha* consist of preponderant alkaloids such as 9-methoxycanthin -6-one and phenolics, could be responsible for the pharmacologic activity of the extract<sup>48</sup>. The antimalarial activity may be due to the antioxidant effect of its alkaloids. It has been postu-

lated that its antioxidant components might inhibit nitric oxide (NO) production in macrophages which will lead to increased degradation of tryptophan and thereby starve the parasite of an essential amino acid leading to its death<sup>49,50</sup>. Different extracts of *enanthiachlorantha* have also been reported to exert antimicrobial activities including antibacterial<sup>51,52</sup>.

However, the use of these herbs in the very young are of major concern. Major challenges include undetermined dosage regimens, immaturity of metabolic and excretory functions, content, preparation, quality of mixtures and duration of treatment (prolonged systemic exposure). Adverse reactions due to herbal medicines occur when used alone<sup>27</sup> or concurrently with conventional or orthodox medicines<sup>15,18</sup>. In this study most of the women (96%) did not report any adverse reactions with herbal medicines on their neonates and infants suggesting good tolerability while 4% of them reported vomiting after herbal medicine intake. There are very few clinical data on safety, kinetics and efficacy. Further research is recommended on the use of these herbal medicines. Randomized clinical trials are needed to evaluate and validate the pharmacological properties of medicinal plants before they can be recommended for use in neonates and very young infants.

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## Conclusions

The use of herbal medicines is common amongst neonates and infants less than six months. Health care workers who care for children should be aware that neonates and infants less than six months also receive herbal medicines. Further studies to evaluate efficacy, safety, potential adverse effects and drug herb interactions are needed.

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