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EFFICACY AND USE OF CASSIA (SENNA) SEEDS IN THE MANAGEMENT OF HYPERTENSION IN ADULTS IN THE ISANGI HEALTH ZONE, DEMOCRATIC REPUBLIC OF CONGO.

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ABSTRACT

Introduction: Hypertension (HTN) is a major global public health concern, representing the primary risk factor for cardiovascular diseases, strokes, and renal failure. Despite therapeutic advancements, its prevalence and the rate of inadequate management remain high, particularly in Sub-Saharan Africa. In many low-resource countries, including the DRC, populations heavily rely on traditional medicine for their primary healthcare needs, driven by accessibility, cost, and cultural factors. This study aims to evaluate the clinical efficacy of using Cassia seeds on blood pressure levels and to describe the rate of recourse to this therapy among hypertensive patients in the Isangi health zone.

Methods: A quasi-experimental, before-and-after study was conducted over a three-month period, from February 2 to April 30, 2025. It involved 18 hypertensive patients attending the Isangi General Hospital and the INERA Yangambi Reference Health Center, selected by convenience sampling. A repeated-measures model of blood pressure (before-and-after) the administration of boiled Cassia senna seeds in water was used on a single intervention group. The Paired Student's t-test was employed to compare the mean Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) at day 0 (D0) with the mean SBP and DBP at week 8 (W8).

Conclusion: The frequency of recourse to Cassia senna seeds was 18.2%, and there is a remarkable efficacy of Cassia (Senna) seed administration in reducing blood pressure among hypertensive participants.

KEYWORDS: charcoal, bagasse, rice husk, Simplex Lattice Design

INTRODUCTION

High Blood Pressure (Hypertension) is a major global public health problem, the main risk factor for cardiovascular disease, stroke and kidney failure. Despite therapeutic advances, its prevalence and the rate of poor management remain high, particularly in sub-Saharan Africa (1).

In therapeutics, medicinal plants are still used throughout the world despite the progress of modern medicine. This very old practice is currently experiencing a revival of interest among the population. They are an important source of bioactive molecules that are generally part of the secondary metabolites. Free radicals contribute to the occurrence of serious diseases such as cancer, diabetes, and cardiovascular disease (2)

In many resource-limited countries, including the DRC, people rely heavily on traditional medicine for their primary health care. This dependence is driven by accessibility, cost, and cultural factors.

The plant *Cassia* (or *Senna obtusifolia/tora*), often called Senna or Seed of *Cassia*, is widely used in traditional Chinese and African pharmacopoeia. Its properties are historically recognized for improving vision and, relevantly, for its Hypotensive and hepatoprotective effects. Pharmacological studies have shown the presence of compounds such as anthraquinones et les glycosides that could modulate blood pressure (1).

In the Isangi health zone, the use of this plant is reported but its real effectiveness has not been scientifically evaluated and the level of use by the hypertensive population is not quantified. Documenting these practices is crucial to integrate, refute or adjust public health recommendations.

II. MATERIAL AND METHOD

2.1. Scope of the study

This study was conducted in the Isangi health zone, located 125 km west of the city of Kisangani, Tshopo Province in the Democratic Republic of Congo. Self-medication with modern and traditional medicines is the first therapeutic recourse in case of illness.

2.2 Study population and sampling

The population of this quasi-experimental study (interventional without randomization or control group) of 18 hypertensive patients attending the Isangi General Hospital and the INERA YANGAMBI Reference Health Center from February 02 to April 30, 2025, selected for convenience.

2.3 Inclusion criteria

The repeated measures model (before and after) on the intervention group alone was used on the basis of the following criteria: being aged between 18 and 65 years, residing in the Isangi health zone, having a diagnosis of stage 1 or 2 hypertension established by a doctor (Systolic Blood Pressure (SBP) > 140 mmHg and/or Diastolic Blood Pressure (DBP) > 90 mmHg), be either naïve to antihypertensive treatment or on uncontrolled treatment (and consent to a temporary adjustment/discontinuation or to the use of *Cassia* as an adjuvant, according to the protocol plan).

2.4 Consent and Membership Criteria

The following criteria were considered: the ability and willingness to give informed and written consent and, the willingness to comply with the schedule of visits and measures (J0, S4, S8).

2.5 Exclusion criteria

The following criteria were used: diagnosis of severe hypertension (SBP \geq 180 mmHg and/or DBP \geq 110 mmHg, presence of acute cardiovascular complications (stroke, recent MI), pregnancy or breastfeeding, advanced chronic kidney or liver disease, regular and recent use of *Senna products* or herbs with a strong laxative action.

2.4 Data Collection Procedure

Data were collected in three main phases: screening (D0), Interim follow-up (S4) and final assessment (S8).

- Screening and baseline (D0): measurement of SBP and DBP after 5 minutes of rest, in a seated position, with a calibrated blood pressure monitor. The measurement is repeated twice, and the average of the two measurements is recorded as the baseline value. Participants receive the *Cassia* extract treatment (one tablespoon boiled in two glasses of water, to be drunk one glass in the morning on an empty stomach and one glass in the evening after a meal).
- Interim follow-up (S4): Assessment of adhesion, measurement of blood pressure, monitoring of tolerance (adverse effects).

- Final assessment (S8): final measurement of SBP and DBP, and blood sample to assess renal (creatinine) and liver (transaminases) functions to ensure safety.

2.6 Data Processing and Analysis

The data were analysed and encoded in the Microsoft Excel software and then analysed using the STATA 13 software, the descriptive analysis was done by calculating means and standard deviations. The paired Student's t-test was used to compare the mean SBP and DBP at D0 with the mean SBP and DBP at W8. We considered the success criterion to be a significant and clinically relevant mean change of > 5 mm Hg in SBP at W8 compared to D0.

2.8 Ethical Considerations

The identity of the respondents and the information provided by them were protected, as well as the confidentiality of the information found, security and risk management were ensured.

Before its implementation, we received the approval of the authorities at various administrative and health levels, as well as the UNIKIS Ethics Committee

III. RESULTS

3.1 Frequency of use of *Cassia (Senna) seeds*



Of the 22 hypertensive patients identified in the two facilities, 4 had already used *Cassia senna* seeds and were therefore excluded from the study. The frequency of use of *Cassia senna* seeds was 18.2%

3.2 Sociodemographic and Clinical Characteristics

Feature	Terms and conditions	Frequency(n=18)	Percentage
Age (year)	42±17		
Gender	Male	11	61,11
	Female	7	38,89
Marital status	Lives alone	3	16,67
	Lives in a union	15	83,33
Profession	Civil servant/employee	5	27,78
	Resourceful	4	22,22
	Agriculture, fisheries and livestock	4	22,22
	Merchant	5	27,78
Level of education	Primary	4	22,22
	Secondary	12	66,67
	Higher and University	2	11,11
Grade d'HTA	Lightweight	2	11,11
	Moderate		88,89
Diabetes	Yes	3	16,67
	Not	15	83,33
Family history	Yes	10	55,56
	Not	8	44,44
Smoking	Yes	9	50
	Not	9	50
Obesity (BMI≥30)	Yes	16	88,89
	Not	2	11,11

The survey results revealed that the age of the participants ranged from 25 to 81 years. They were mostly male, living in a couple (or in a conjugal union), and mainly engaged in a professional activity in

commerce or were state civil servants. Their dominant level of education was high school.

Clinically, the participants had a picture of moderate hypertension and were non-diabetic. A family history of high blood pressure was common. Regarding the risk factors, they used tobacco, especially piser (or non-manufactured tobacco), and were obese.

3.3 Efficacy of Cassia (Senna) Seeds in the Management of High Blood Pressure

Variable	Forward Measurements (n=18)	Measurements after (n=18)	Average difference (n=18)	IC 95%	P-value
Systolic Blood Pressure (mmHg)	170±6,7	121±8,5	49±8,7	[47,3-55,9]	<0.001
Diastolic Blood Pressure) (mmHg)	103±4,8	71±5	32±8.1	[26,1-34,1]	<0.001
Mean Arterial Pressure (mmHg)	126.3±2.8	88.3±5.6	49±4.6	[35,7-40,3]	<0.001

The results of this study demonstrate a remarkable efficacy of *Cassia* (Senna) seed administration in reducing blood pressure in hypertensive participants. The mean systolic blood pressure (SBP) dropped from 170 mm Hg (before) to 121 mm Hg (after), a mean difference of 49±8.7 mm Hg. Similarly, mean diastolic blood pressure (DBP) decreased from 103 mm Hg to 71 mm Hg, representing a mean difference of 32 ± 8.1 mm Hg.

IV. DISCUSSION

Sociodemographic and Clinical Profile

The study population (n=18) presents a typical profile of populations at risk of hypertension (hypertension) in many contexts. The high average age of the participants (25 to 81 years) underlines the study of a Established and chronic hypertension (5). The male predominance is consistent with epidemiological observations in several regions where men consult less or are more exposed to certain occupational or behavioural risk factors (3).

Our results are similar to what Cambou found. JP where hypertension is familial in 45% of patients. Tobacco and obesity are the dominant risk factors with 42.37% and 30.5% frequency respectively (4).

Another study also shows that hypertension was present in 47% of men and 35% of women, i.e. 23.9% and 8.4% respectively between 35-44 years of age and 79.8% and 71.3% for 65-75 year olds. (5)

In France, hypertension is a disease that mainly affects elderly people. The treatment modalities are different depending on age. Cognitive complaints are more common in uncontrolled hypertensive patients and in patients with a history of stroke (5).

Associated cardiovascular risk factors

The results highlight the presence of several major risk factors in the cohort, which reinforces the importance of the intervention. Participants had obesity and tobacco use, two of the most potent and modifiable risk factors for hypertension (5). Obesity is strongly correlated with insulin resistance and overactivity of the sympathetic nervous system, promoting hypertension.

The presence of frequent family history of hypertension highlights a strong familial genetic or environmental component in this population (6). The fact that the participants were Non-diabetic is an important methodological point, as diabetes is a major confounding factor that could alter the response to antihypertensive treatments. The study thus focuses on the effect in subjects with hypertension without the associated diabetic comorbidity, which is a strength in isolating the effect of treatment. Hypertension increases cardiovascular morbidity and mortality in diabetic patients. This combination requires therapeutic intensification aimed at better control of all associated cardiovascular RDFs (6).

Anti-hypertensive efficacy

The observed effectiveness of *Cassia* seeds in reducing blood pressure is remarkable and clinically impressive.

This magnitude of the reduction makes it possible to achieve blood pressure targets considered optimal or in the high standard (STEP=121 mm Hg, PAD=71 mm Hg). Such a decrease in SBP is generally associated with a decrease in 30% à 40 % the risk of stroke and 20% à 25% the risk of myocardial infarction (7). The very high statistical significance ($P < 0.001$) for all measurements confirms that this effect is not due to chance, but to the intervention.

The antihypertensive effect of *Cassia (Séné)* can be attributed to the richness of the plant in Secondary metabolites. Vasodilatory and anti-inflammatory properties: The plant is known to contain polyphenols and flavonoids. These compounds are powerful antioxidants that may work by improving endothelial function (by increasing the bioavailability of nitric oxide, or (NO) and reducing oxidative stress. Better endothelial function is directly reflected in a vasodilation and a reduction in peripheral vascular resistance, leading to a decrease in blood pressure(7)

The root has purgative effects; It treats heart disease, fever, biliary disorders, nausea, urine retention, among others. Leaf extracts are effective against ringworm, [cough](#) and [snakebites](#). The pulp of the fruit is laxative and analgesic; It can relieve chest obstructions, heat built up in the circulatory system, and intense heat built up in liver tissue. It is also a mild laxative for children and women, which improves visual acuity and facilitates intestinal transit to relieve constipation(8).

These plants with medicinal properties, such as the *by Cassia*, contain many metabolites capable of inducing specific physiological effects on animals, humans or plants. According to Mondal, in Ayurvedic medicine, traditional Hindu medicine, different species of the genus *Cassia* are used for therapeutic purposes. Some species *by Cassia* are known to eliminate pathogens from the body, which explains their growing economic importance(8).

The beneficial effect of polyphenols on endothelial function has been demonstrated in several experimental models of hypertension, a pathology associated with endothelial dysfunction. Thus, in the genetic model of hypertension, spontaneously hypertensive rats, the ingestion of red wine or a grape seed extract is associated with a significant reduction in blood pressure (9)

Ingestion of products rich in polyphenols derived from grapes has also shown beneficial effects on endothelial function in experimental models of hypercholesterolemia and diabetes (9).

V. CONCLUSION

In conclusion, the frequency of use of *Cassia senna* seeds was 18.2% among the population studied, highlighting a notable traditional use. Clinical results confirm the therapeutic potential of *Cassia* seeds as a natural agent for the management of high blood pressure.

However, while these results are very promising, they need to be confirmed by randomized, controlled, larger-scale studies. This research is needed to validate the long-term safety and efficacy of this treatment and to elucidate the precise pharmacological mechanism of action of this herb on the cardiovascular system.

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