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The problem of treating anaemia in children: Medicinal plants versus blood transfusion

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Abstract

Introduction: This study looked at the problem of treating anaemia using both medicinal plants and blood transfusions. The aim was to identify the problems associated with treating children's anaemia using blood transfusions or medicinal plants, to show why parents choose to treat their children's anaemia, to identify the reasons for using medicinal plants to treat children's anaemia and to list the medicinal plants used to treat anaemia.

Methodology: To achieve these objectives, we used a cross-sectional descriptive approach based on direct structured interviews with mothers hospitalized with their children in the paediatrics department of the GRH/Makiso and at the Centre Traditional-modern Jesus Heals, during the three-month period from 1 June to 31 August 2023. As a result, 40 study subjects were selected, 20 from each investigation site.

Results: The following results were obtained in relation to problems associated with the treatment of anaemia in children: 30.0% of the subjects in the study who had had a relapse to traditional anaemia treatment at the CTM Jesus Heals and problems related to the treatment of anaemia by transfusion and traditional treatment, 50.0% of the subjects in the study mentioned the reason why traditional treatment corrects anaemia, i.e. 25.0% at the CTM Jesus Heals and blood transfusion improves the child's state of health, i.e. 25.0% at the HGR/Makiso. At the CTM Jesus Heals, anaemia was treated with medicinal plants, in particular sweet potato leaves (20.0%), papaya leaves (12.5%), avocado leaves (10.0%) and Bokomu leaves (7.5%).

Conclusion: Anaemia is a public health problem in Kisangani, causing a high morbidity rate among children. It is therefore important to provide effective medical treatment with a view to reducing the number of deaths due to anaemia.

Keywords: Treatment; Anemia; Medicinal plants; Blood transfusion

1. Introduction

Anaemia refers to a reduction in red blood cell volume or haemoglobin concentration below the level considered normal for the patient's age/sex. Severe anaemia is a major cause of morbidity and mortality in children [1].

To correct anaemia, blood transfusion is often used, which is a medical discipline whose particularity is to treat man with man. Transfusion of different blood components reduces transfusion risks and prevents the loss of other blood components that are not indicated. In Kisangani, the only blood product offered remains whole blood despite the lack of self-sufficiency and the need to increase supply by promoting voluntary blood donation in DR Congo [2].

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A good number of medicinal plants are known to treat an abnormal drop in haemoglobin levels. It is also recommended to eat fruit and vegetables that are particularly rich in minerals and B vitamins [3].

Anaemia is a major public health issue in all poor countries. It particularly affects young children and women of childbearing age. According to estimates by the World Health Organization [4], two billion people worldwide are anaemic. The consequences of anaemia affect both the health of populations and the economic and social development of communities and countries. According to a 2017 WHO estimate, anaemia is a major global health problem, affecting two billion people, mainly in developing countries. The two main groups at risk are children and pregnant women.

Young children and pregnant women are the most vulnerable and affected, with an estimated overall prevalence of 48% and 51% respectively. The prevalence of anaemia is 37% in school-age children, 35% in non-pregnant women and 18% in adult men [5].

It therefore appears that, when faced with anaemia in children, either transfusion or traditional medicine can be used to correct this disease which is decimating thousands of children.

Blood transfusion, the last resort in the face of severe anaemia, is a procedure regularly practiced in pediatric settings in Africa [6]. Despite the recognized effectiveness of this therapy, some children will die after blood transfusion [7]. Several factors are associated with mortality in transfused children, including those directly linked to blood transfusion, such as serious transfusion accidents, and others linked to the disease causing severe anaemia, such as severe malaria. Identifying these factors would make it possible to anticipate potential complications and control them in order to avoid the death of transfused children [8].

In Africa, the use of plants for therapeutic purposes is a centuries-old practice. A few studies have shown positive results from medicinal plants in combating anaemia in children.

In Kisangani, the capital city of Tshopo Province (DRC), Bulaya [9] demonstrated in his study that the use of traditional plants, in the case of *Arnica montana*, was effective in combating anaemia in children by increasing haemoglobin levels. Before taking *Arnica montana*, 50.9% of subjects had haemoglobin levels of between 13 and 16 g/dl. After taking *Arnica montana* in February 2020, which is the initial month of the experiment in the laboratory of the Gracia Foundation Health Center, 66.1% of subjects had haemoglobin levels of between 15-18 g/dl, in March 2020 this had fallen to 10-12 g/dl in 52.8% of cases, and in April 2020 the haemoglobin level had risen to 13-15 g/dl in 56.6% of cases.

The aim of this study is to improve the management of anaemia in children by demonstrating the efficacy of transfusion and medicinal plants as alternatives for correcting this condition.

This general objective is followed by the following specific objectives:

- Identify the problems associated with treating anaemia in children using blood transfusions or medicinal plants;
- Identify the reasons for using medicinal plants to treat anaemia in children.

2. Methodology

2.1. Study setting

Our study was carried out at two different sites: the Makiso/Kisangani General Referral Hospital and the Jesus heals Traditional-modern Centre.

The Makiso/Kisangani General Referral Hospital is located on avenue Munyororo n° 215/b, Plateau Médical Quarter in the commune of Makiso. The Makiso/Kisangani General Referral Hospital is a tertiary level health facility located in the Kisangani Township, in the commune of Makiso in the Democratic Republic of Congo.

Considering its geographical boundaries, the Makiso/Kisangani General Referral Hospital is bounded

- To the East by the Provincial Office of the Red Cross of the DR Congo;
- To the West by the Prince Alwaleed Ben Mansour Health Centre and, a little further on, the Simisimi Military Airport;

- To the North by the Cemetery of the victims of the Six-Day War and
- To the South by the Provincial Health Inspectorate and a little further on by the Kisangani University Clinics.

The Jesus heals Traditional-modern Centre is located on Coconut Avenue No 15 in the Tchatchi district of the Makiso commune.

Geographically, the Jesus heals Traditional-modern Centre is bounded

- To the East by the Kisangani Central Prison
- To the West by the Makiso Peace Court;
- To the North by the Bolongue Espace and
- To the South by the Phoenix Establishments.

2.2. Study population

Our study population consisted of 40 mothers hospitalized with their children in the pediatrics department of the Makiso/Kisangani General Referral Hospital and at the Jesus heals Traditional-modern Centre.

2.3. Study sample

This was the exhaustive sample, made up of 40 mothers hospitalized with their children with a clinical picture of severe anaemia, during the period under examination at the Makiso/Kisangani General Referral Hospital and at the Jesus heals Traditional-modern Centre.

2.4. Type of study

To achieve the objectives assigned to this study, we used a descriptive cross-sectional approach, conducted among mothers hospitalized with their children in the pediatrics department of the Makiso/Kisangani General Referral Hospital and at the Jesus heals Traditional-modern Centre, during the three-months period from June 1st to August 31, 2023.

2.5. Data collection technique

We used the structured face-to-face interview technique, and to achieve this we administered a pre-established questionnaire to the respondents.

The interview was conducted directly with the respondents. After filling in the identity details, the respondent was asked to answer a few selected questions with the aim of analyzing the problem of anaemia treatment using both medicinal plants and transfusions, while assuring her that her answers would be treated anonymously.

To this end, a data collection form was drawn up in advance, providing the instrument that enabled us to gather the information relevant to our research. The data collection form included open and closed questions.

2.6. Data processing technique

The data we collected were grouped into frequency tables and then transformed into percentages for interpretation. To process the data, we used SPSS version 21 software, which enabled us to carry out the statistical analyses.

2.7. Ethical aspects

Participation in this study was voluntary. Consent was free and informed, but verbal only. Respondents were told that if they agreed to participate in this study, a questionnaire would be administered to them. The respondent who freely agreed to be recruited could withdraw from the study at any time without prejudice.

3. Results

3.1. Age and educational level

Table 1 Distribution of study subjects by age and educational level

Profile of study subjects		GRH/Makiso		Jesus Heals/TMC		Total	
		f	%	F	%	f	%
Age (years)	20 - 29	5	12.5	2	5.0	7	17.5
	30 - 39	10	25.0	6	15.0	16	40.0
	40 - 50	5	12.5	12	30.0	17	42.5
Educational level	Literacy	1	2.5	0	0.0	1	2.5
	Primary	3	7.5	4	10.0	7	17.5
	Secondary	7	17.5	10	25.0	17	42.5
	Higher	9	22.5	6	15.0	15	37.5

This table shows that 42.5% of respondents were aged between 40 and 50; including 30.0% at the Jesus heals Traditional-modern Centre and 12.5% at the Makiso/Kisangani General Referral Hospital. In addition, 42.5% of the respondents had secondary educational level, including 25.0% at the Jesus heals Traditional-modern Centre and 17.5% at the Makiso/Kisangani General Referral Hospital, followed by higher and university educational level, i.e. 37.5%, including 15.0% at the Jesus heals Traditional-modern Centre and 22.5% at the Makiso/Kisangani General Referral Hospital.

3.2. Transfusion and herbal treatment of anaemia

3.2.1. Reason for consultation

Table 2 Distribution of study subjects according to reason for consultation

Reason for consultation	GRH/Makiso		Reason for consultation	Jesus Heals/TMC		Total	
	f	%		f	%	f	%
Fever	11	27.5	Lack of financial means	10	25.0	21	52.5
Malaise	4	10.0	Religious doctrine	5	12.5	9	22.5
Convulsion	5	12.5	Speed of cure	5	12.5	10	25.0
Total	20	50.0	Total	20	50.0	40	100.0

Analysis of this table shows that 10 subjects, or 25.0%, had consulted the Jesus heals Traditional-modern Center for lack of financial resources, and 11, or 27.5%, had consulted the Makiso/Kisangani General Referral Hospital for fever.

3.2.2. Problems in treating anaemia

This table shows that 12 study subjects (30.0%) had relapsed on traditional anaemia treatment at the Jesus heals Traditional-modern Center and 10 (25.0%) at the Makiso/Kisangani General Referral Hospital had blood group incompatibility as a problem related to anaemia treatment by transfusion and traditional treatment, followed by overdose (10.0%) at the Jesus heals Traditional-modern Center and transfusion reaction at the Makiso/Kisangani General Referral Hospital.

Table 3 Distribution of study subjects according to problems related to the treatment of anaemia by transfusion and traditional medicine

Problems related to transfusion	GRH/Makiso		Problems related to traditional medicine	Jesus Heals/TMC		Total	
	f	%		f	%	f	%
Blood group incompatibility	10	25.0	Treatment relapse	12	30.0	22	55.0
Transfusion reaction	5	12.5	Overdose	4	10.0	9	22.5
Vomiting	3	7.5	Intoxication	3	7.5	6	15.0
Convulsion	2	5.0	Convulsion	1	2.5	3	7.5
Total	20	50.0	Total	20	50.0	40	100.0

3.2.3. Effectiveness of anaemia treatment

Table 4 Distribution of study subjects according to efficacy of anaemia treatment

Effectiveness	GRH/Makiso		Effectiveness	Jesus Heals/TMC		Total	
	f	%		f	%	f	%
Efficiency	17	42.5	Efficiency	13	32.5	30	75.0
Non efficiency	3	7.5	Non efficiency	7	17.5	10	25.0
Total	20	50.0	Total	20	50.0	40	100.0

This table shows that 30 respondents, i.e. 75.0%, had indicated that the treatment was effective, 32.5% of whom were cured by the Jesus heals Traditional-modern Center and 42.5% by blood transfusion at the Makiso/Kisangani General Referral Hospital.

3.2.4. Reason for effectiveness of anaemia treatment

Table 5 Distribution of study subjects according to effectiveness of anaemia treatment

Reason for effectiveness of anaemia treatment	GRH/Makiso		Reason for effectiveness of anaemia treatment	Jesus Heals/TMC		Total	
	f	%		f	%	f	%
Transfusion improves a child's state of health	10	25.0	Medicinal plants correct anaemia	10	25.0	20	50.0
Transfusion recovers quickly	7	17.5	Traditional treatment is rapid	5	12.5	12	30.0
Transfusion is flexible and fast	3	7.5	Relapse is not an option	5	12.5	8	20.0
Total	20	50.0	Total	20	50.0	40	100.0

The data in this table show that 20 respondentrs, or 50.0%, indicated that the treatment was effective, including 25.0% at the Jesus heals Traditional-modern Center because the traditional treatment corrected the anaemia and 25.0% at the Makiso/Kisangani General Referral Hospital because the blood transfusion improved the child's state of health.

3.2.5. Treatment of anaemia

The table shows that all the subjects in the study treated at the Makiso/Kisangani General Referral Hospital (50.0%) were receiving transfusions, and at the Jesus heals Traditional-modern Center the anaemia was treated with medicinal plants, in particular sweet potato leaves (20.0%), papaya leaves (12.5%), avocado leaves (10.0%) and Bokomu leaves (7.5%).

Table 6 Distribution of study subjects according to anaemia treatment

Treatment of anaemia	GRH/Makiso		Treatment with medicinal plants	Jesus Heals/TMC		Total	
	f	%		f	%	f	%
Blood transfusion	20	50.0	Sweet potato leaves	8	20.0	28	70.0
			Papaya leaves	5	12.5	5	12.5
			Avocado leaves	4	10.0	4	10.0
			Bokomu leaves	3	7.5	3	7.5
TOTAL	20	50.0		20	50.0	40	100.0

4. Discussion

4.1. Age

In terms of age, we noted that 42.5% of the subjects in the study were between 40 and 50 years of age, including 30.0% at the Jesus heals Traditional-modern Center and 12.5% at the Makiso/Kisangani General Referral Hospital. This is a relatively adult population.

In Benin, Sobakin et al [10], in their series on "Ethno-medicinal evaluation of herbaceous plants in the Guineo-Congolese zone of Benin", found that the majority of people (53.4%) using medicinal plants to treat anaemia were aged between 40 and 60. In modern medicine, Dembele [11], in his study on "Evaluation of the practice of blood transfusion in the emergency department of the Gabriel Touré University Hospital", found that young people (60.1%) were predominantly represented. Nguefack et al [12] in Yaoundé also found that the majority of transfusion patients were in the 2 to 5 age group.

Adults consult more to accompany their children suffering from anaemia and this determines their parental responsibility. This could show that children are more concerned by transfusion because they are the most vulnerable. Children under the age of five are the most fragile group of people and the most exposed to anaemia and malnutrition.

4.2. Educational level

According to our analysis, 42.5% of the subjects in the study had secondary education, including 25.0% at the Jesus heals Traditional-modern Center and 17.5% at the Makiso/Kisangani General Referral Hospital, followed by higher and university education, i.e. 37.5%, including 15.0% at the Jesus heals Traditional-modern Center and 22.5% at the Makiso/Kisangani General Referral Hospital.

In Côte d'Ivoire, Akindes et al [13], in their study on "Anaemia in Côte d'Ivoire: the value of a social approach", found that 63.5% of study subjects were at secondary school level. Similarly, Dembele [11] found 59.1% in the same category.

The level of education is an important factor in assessing the reason for using health services in the event of illness. The high rate at secondary level is linked to the fact that many people in our communities lack the means to continue their studies at university.

4.3. Reason for consultation

In this series, we noted that 25.0% of the subjects in the study had consulted the Jesus heals Traditional-modern Center for lack of financial means and 27.5% had consulted the Makiso/Kisangani General Referral Hospital for fever.

Bijika [14], in a study carried out at the Kabondo General Referral Hospital, found that fever, physical asthenia and mucocutaneous pallor were the most common reasons, accounting for 100% of cases. In Yaoundé, Nguefack et al [12] found that 57.02% of patients were febrile.

The high rate of fever as a reason for consultation among the study subjects treated at the Makiso/Kisangani General Referral Hospital would be linked either to a malaria picture or to a well-diagnosed infection. On the other hand, most of the people consulted at the Jesus heals Traditional-modern Center for a variety of reasons, including low socio-economic status, a factor that contributes to low use of health services in our communities.

4.4. Problems in treating anaemia

Several problems can be attributed to the treatment of anaemia. In this series, we observed 30.0% of study subjects who had relapsed on traditional anaemia treatment at the Jesus heals Traditional-modern Center and problems related to the treatment of anaemia by transfusion and traditional treatment, followed by overdose (10.0%) at the Jesus heals Traditional-modern Center and transfusion reaction at the Makiso/Kisangani General Referral Hospital.

According to Dembele [11], fever and shivering were the incidents most frequently encountered in his study (54.12% and 42.06% respectively). Transfusion-related incidents were also mentioned in the study by Bijika [14], where convulsion (48.3%) and blood group incompatibility (36.4%) were the most frequently observed. In Guinea, Sobakin, et al [10], the traditional treatment of anaemia presented some problems, notably overdosing (56.3%) and excessive increase in haemoglobin levels (33.4%).

These incidents constitute a worrying situation in the treatment of anaemia, which could demonstrate that blood transfusion is a medical practice that involves risks and deserves particular attention throughout the transfusion chain.

4.5. Effectiveness of anaemia treatment

In terms of efficacy, 75.0% of the subjects in the study indicated that the treatment was effective, including 32.5% at the Jesus heals Traditional-modern Center and 42.5% at the Makiso/Kisangani General Referral Hospital.

The efficacy of herbal treatment for anaemia was demonstrated in the study by Sobakin et al [10], who found 68.3% and Bijika [14] noted 91.9% of cases were cured following blood transfusion. This result is similar to that of Bulaya [9] who found that 73.5% of anaemic children left hospital cured.

We can justify the satisfaction of the study subjects by the improvement and recovery of the children at the end of the treatment. The fact that the study subjects reported that the anaemia treatment was effective in both study sites implies that they were satisfied. This would demonstrate that the indication for transfusion depends on several factors, including clinical and biological criteria and the judgement of the practitioner.

4.6. Reason for effectiveness of anaemia treatment

Concerning the reason for the effectiveness of anaemia treatment in the two sites of investigation, it was observed in this series that 50.0% of the subjects in the study mentioned the reason why traditional treatment corrects anaemia, i.e. 25.0% at the Jesus heals Traditional-modern Center, and blood transfusion improves the child's state of health, i.e. 25.0% at the Makiso/Kisangani General Referral Hospital.

Blood transfusion saves many lives during emergency medical care for people suffering from a shortage of one or more blood components. Nevertheless, this act is fraught with risks and cannot be considered trivial or harmless. Indeed, any transfusion recipient is exposed to the risk of accidents that may occur early or late, such as the transmission of an infectious disease [15].

We believe that the subjects in this study were not wrong to rely on modern medicine to treat anaemia through blood transfusion. However, the use of traditional herbal medicine is also good but is limited as regards diagnosis and dosage, in short, the active principle of the remedies.

4.7. Treatment of anaemia

With regard to treatment, all the subjects in the study treated at the Makiso/Kisangani General Referral Hospital received blood transfusions (50.0%), and at the Jesus heals Traditional-modern Center, anaemia was treated with medicinal plants, in particular sweet potato leaves (20.0%), papaya leaves (12.5%), avocado leaves (10.0%) and Bokomu leaves (7.5%). Blood transfusion is a very important therapeutic alternative in the management of severe anaemia. However, it can have consequences for both blood donors and recipients. In recipients, it can lead to metabolic, immuno-allergic or infectious complications [16].

Bonzali [17] highlighted a number of products used to treat anaemia, including tomatoes, spinach, maracuja *(Passion fruit)*, okra, grapefruit, cassava leaves, cabbage, avocado, coconut roots and lemons. Nowadays, traditional medicine is being used more and more, even by city-dwellers who used to rely on modern medical and pharmaceutical care. During the colonial era, the healer could be imprisoned for a simple treatment. These circumstances are at the root of the loss of traditional knowledge, which fell into oblivion [18, 19, 20].

Traditional medicine is still based on medicinal plants that can be used in a drinkable solution, applicable and for anal use.

5. Conclusion

To achieve these objectives, we used a cross-sectional descriptive approach based on direct structured interviews with mothers hospitalized with their children in the paediatrics department of the Makiso/Kisangani General Referral Hospital and at the Jesus heals Traditional-modern Center, during the three-month period from June 1st, to August 31, 2023. As a result, 40 study subjects were selected, 20 from each investigation site.

At the end of our analyses, the following results emerged

- With regard to problems related to the treatment of anaemia in children: 30.0% of study subjects who had relapsed on traditional anaemia treatment at the Jesus heals Traditional-modern Center and problems related to the treatment of anaemia by transfusion and traditional treatment;
- 50.0% of study subjects mentioned the reason why traditional treatment corrects anaemia, i.e. 25.0% at the Jesus heals Traditional-modern Center and blood transfusion improves the child's state of health, i.e. 25.0% at the Makiso/Kisangani General Referral Hospital;
- At the Jesus heals Traditional-modern Center, anaemia was treated with medicinal plants, in particular sweet potato leaves (20.0%), papaya leaves (12.5%), avocado leaves (10.0%) and Bokomu leaves (7.5%).
- Anaemia in children is a major public health problem and its treatment in Kisangani's hospitals deserves to be analyzed with acuity. In addition to medical treatment, there are also traditional modern centers that are consulted for the same cases. Very often, the use of traditional medicine is justified by the low income of the parents.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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