OPEN ACCESS

Ghana Alternative Medicine Journal (GAMJ)

Abbreviated Key Title: Gha alt Med Jrnl
ISSN 2756-7176 (Print) Open Access
Journal homepage: https://saspublishers.com/journal/gamj/home

Epidemiological, Clinical and Biological Profile of Anemia in Outpatients at the Internal Medicine Unit of the Fousseyni Daou Hospital in Kayes

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DOI: 10.36347/gamj.2023.v04i01.004 | **Received:** 11.01.2023 | **Accepted:** 16.02.2023 | **Published:** 28.02.2023

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Abstract **Original Research Article**

***Introduction*:** Anemia is one of the most common public health problems in the world and affects all ages. ***Objective*:** To describe the epidemiological, clinical and biological profile of anemia in the internal medicine unit of the Fousseyni Daou hospital in Kayes. ***Methodology*:** It was a descriptive and cross-sectional study with retrospective data collection which took place from January 1 to December 31, 2020 at the Internal Medicine Unit of the Fousseyni Daou Hospital in Kayes. It covered all anemic patients seen in outpatient clinics during the study period. ***Results*:** We identified 197 cases of anemia out of 1883 patients admitted to the Unit, either a hospital prevalence of 10.46%. The age group from 26 to 35 years was the most represented, that is to say 67 cases (34.01%) with an average age of 25 years, the female sex predominated, 107 cases (54.31%) with a sex ratio of 0.84. Housewives represented 104 cases (52.8%). The majority of patients resided in rural areas 48 cases (52.75%). Gastropathy was the most found antecedent 76 cases (38.58%) followed by hypertension 53 cases (26.90%); 121 patients (61.42%) had no history. The main clinical manifestations were: conjunctival pallor 118 cases (59.9%), vertigo 112 cases (56.85%), physical asthenia 109 cases (55.33%), dyspnea 101 cases (51.26 %), headaches 99 cases (50.25%). The associated pathologies were: hypertension 76 cases (38.58%), followed by malnutrition (anorexia) 67 cases (34.01%). Biologically, microcytic anemia was the most frequent 127 cases (64.47%), followed by normocytic anemia 53 cases (26.90%) and macrocytic anemia 17 cases (8.63%). Normochromic anemia was more encountered in 104 cases (52,79%) compared to anemia hypochromic 93 cases (47.21%). Mild anemia was more frequent 119 cases (60.41%) followed by moderate anemia 62 cases (31.47%). Anemia was severe in 16 cases (8.12%). ***Conclusion*:** Anemia is a common condition in current hospital practice. Its severity is associated with the decrease in the immune capacity of patients and the multiple associated pathologies.

Keywords: Anemia, epidemiology, clinic, biology, internal medicine, Fousseyni Daou Hospital, Kayes, Mali.

INTRODUCTION

Anemia remains a major public health problem in the world, due to its magnitude and severity. It is expressed when the level of circulating hemoglobin in the blood is low. The limits set by the WHO are respectively 12 g/dl in women, 13 g/dl in men, 11g/dl in pregnant women and 14g/dl in children [1].

It affects more than 1.64 billion people, or 24.8% of the world's population. The highest prevalence is reported in low- and middle-income countries with an overall frequency above 40% [2].

It is an indicator of undernutrition, poverty and present in parasitized people (helminthiasis: ascariasis, trichocephalosis) [1, 2].

In Mali, data from the statistical directory (Local Health Information System) for 2019 report 51,070 cases of anemia, including 21,376 cases among people aged 15 to 65 and over in first-level health structures with 707 cases of overall death, including 269 deaths among people aged 15 to 65 and over. These data show the extent of anemia in our populations [3].

The consequences of anemia are many and varied. It affects physical growth, cognitive development, reproduction and physical work capacity resulting in decreased human performance [2].

We did not find any work relating to the epidemiological, clinical, biological aspects of anemia in the internal medicine unit of the Fousseyni Daou hospital in Kayes.

Thus, we carried out this work in order to describe these different aspects to contribute to the improvement of the management of anemia.

METHODOLOGY

It was a descriptive and cross-sectional study with retrospective data collection which took place from January 1 to December 31, 2020 at the Internal Medicine Unit of the Fousseyni Daou Hospital in Kayes. Were included All consenting patients seen in an outpatient setting during the period of our study and presenting with anemia. Were excluded from the study, patients seen in an outpatient setting without anemia.

The diagnosis of anemia was retained when the complete blood count shows a hemoglobin level < 13g/dl in men and 12g/dl in women.

The finding of anemia requires the analysis of the following biological parameters.

The mean corpuscular volume (MCV) which makes it possible to separate:

- Microcytic anemia (VGM < 80 fl),
- Macrocytic anemia (VGM > 100 fl),
- Normocytic anemia (80 fl < VGM < 100 fl).

The mean corpuscular Hb content (TCMH): (N: 27-32 pg) makes it possible to differentiate hypochromia (TCMH < 27 pg) from normochromia (TCMH ≥ 32 pg).

The mean corpuscular hemoglobin concentration (MCHC) makes it possible to differentiate hypochromia (MCHC < 32%) from normochromia (MCHC ≥ 32%). The CCMH is of less interest than the TCMH.

The degree of anemia was assessed as follows:

- **Severe Anemia:** Hemoglobin level ≤ 6.99g/dl,
- **Moderate Anemia:** Hemoglobin level between 7 and 9.99 g/dl,
- **Mild Anemia:** Hemoglobin level between 10 and 11.99 g/dl in women and 10¬ 12.99 g/dl in men.

The data was collected on pre-established survey sheets, entered into Microsoft Word 2007 and Excel 2013 and analyzed using Epi Info software.

Information collected from patient records was completely confidential and used for research purposes.

RESULTS

We identified 197 cases of anemia out of 1883 patients admitted to the Unit, i.e. a hospital prevalence of 10.46%.

The age group of 26 to 35 years was the most represented in 67 cases (34.01%) followed by the age group of 16- 25 years 41 cases (20.81%) (See Figure 1) with as average age 25 years. The female sex was predominant, 107 cases (54.31%) with a sex ratio of 0.84 (See Figure 2). Housewives were the largest group with 104 cases (52.8%) (See Table 1). The majority of patients lived in rural areas 48 cases (52.75%) (See Figure 3). Gastropathy was the most found antecedent 76 cases (38.58%) followed by hypertension 53 cases (26.90%); 121 patients (61.42%) had no history (See Table 2). The main clinical manifestations were: conjunctival pallor 118 cases (59.9%), vertigo 112 cases (56.85%), physical asthenia 109 cases (55.33%), dyspnea 101 cases (51.26 %), headaches 99 cases (50.25%) (See Table 3).

The associated pathologies were: hypertension 76 cases (38.58%) followed by malnutrition 67 cases (34.01%) (See Table 4).

Biologically, microcytic anemia was the most frequent 127 cases (64.47%), followed by normocytic anemia 53 cases (26.90%) and macrocytic anemia 17 cases (8.63%) (See Figure 4).

Normochromic anemia was more encountered in 104 cases (52, 79%) compared to anemia hypochromic 93 cases (47.21%) (See Figure 5).

Depending on the severity, mild anemia was more frequent in 119 cases (60.41%) followed by moderate anemia in 62 cases (31.47%). Anemia was severe in 16 cases (8.12%) (See Figure 6).

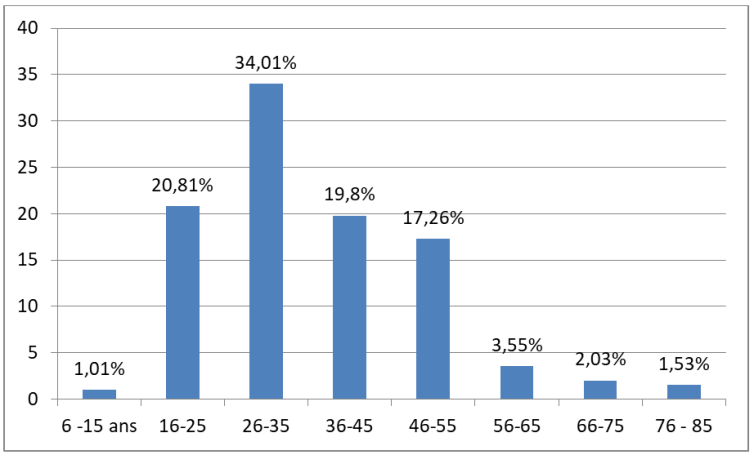

Figure 1: Distribution of patients according to age

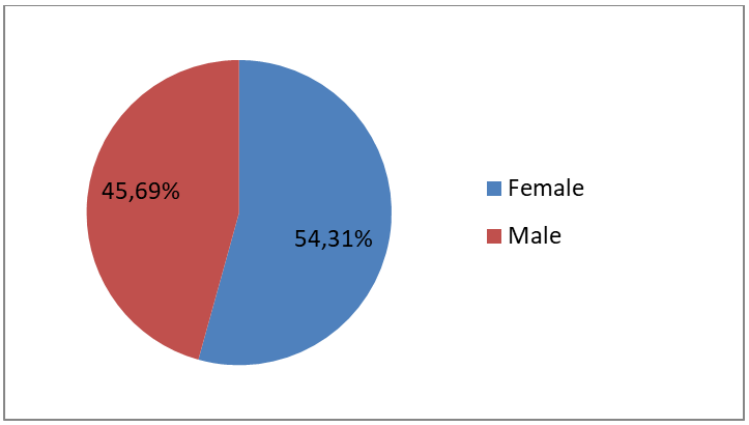

Figure 2: Distribution of patients by gender

Table 1: Distribution of patients by profession

Occupation	Workforce	Percentage (%)
Housewife	104	52,8
Cultivator	53	26,9
Shopkeeper	13	6,6
Saleswoman	10	5,07
Shepherd	7	3,56
Worker	5	2,54
Gold panning	3	1,52
Breeder	2	1,01
Total	**197**	**100**

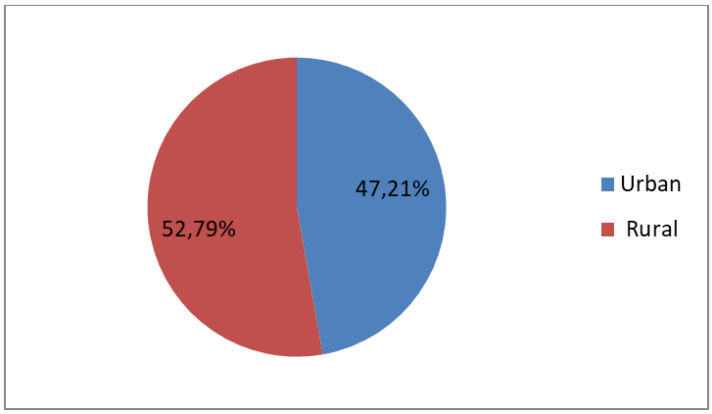

Figure 3: Distribution of patients by place of residence

Table 2: Distribution of patients according to medical history

Medical background	Workforce	Percentage (%)
Gastropathy	76	38,58
High blood pressure	53	26,90
Diabetes	5	2,53
HIV	6	3,04
Chronic renal failure	4	2,03
Insuf. Card	3	1,52
Hemorrhoid	6	3,04
Drop	1	0,5
Emphysema	1	0,5
Autoimmune disease	4	2,03
Cirrhosis	4	2,03
HCC	2	1,01
Prostate adenoma	3	1,52
Stroke	1	0,5
Hyperthyroidism	2	1,01
Inguinal hernia	2	1,01
Appendectomy	5	2,53
Caesarean section	7	3,55
Fibroid	4	2,03
No history	121	61,42

Table 3: Distribution of patients according to clinical signs

Clinical signs	Workforce	Percentage (%)
Conjunctival pallor	118	59,9
Vertigo	112	56,85
Asthenia	109	55,33
Dyspnea on exertion	101	51,26
Headaches	99	50,25
Palpitations	90	45,68
Tachycardia	90	45,68
Abdominal pain	88	44,67
Bloating	79	40,10
Constipation	105	53,3
Geophagy	17	9,63
Dysphagia	55	27,92
Systolic murmur	18	9,13
Lower limb edema	14	7,10
Perleche	7	3,55
Koilonichie	13	6,59

Table 4: Distribution of patients according to associated pathologies

Associated pathologies	Workforce	Percentage (%)
High blood pressure	76	38,58
Malnutrition (anorexia)	67	34,01
Gastropathy	53	26,90
Bacterial pneumonitis	27	14,21
HIV	6	3,04
Chronic renal failure	4	2,03
Hemoglobinopathy	4	2,03
Pulmonary tuberculosis	2	1,01
Abundant/prolonged rule	33	16,75
Postpartum hemorrhage	3	1,52
Meadow heart disease	3	1,52
Autoimmune diseases	4	2,03
Malaria	3	1,52
Diabetes	5	2,54

Associated pathologies	Workforce	Percentage (%)
Chronic liver disease	6	3,04
Hematological malignancies	5	2,54
Pleurisy	7	3,55
Urinary tract infection	11	5,58
Gastroenteritis	8	4,06
Intestinal parasitosis	19	9,64

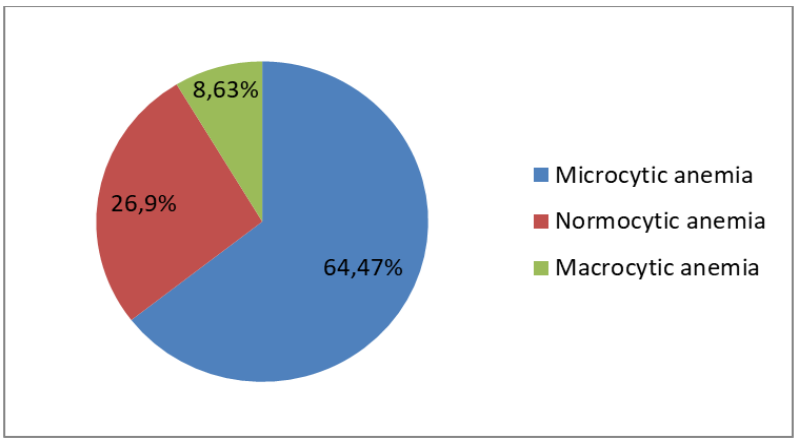

Figure 4: Distribution of patients according to MCV

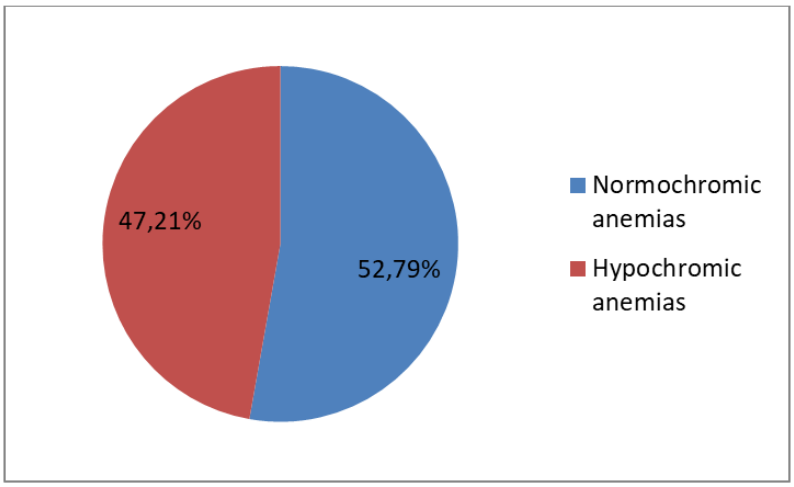

Figure 5: Distribution of patients according to TCMH

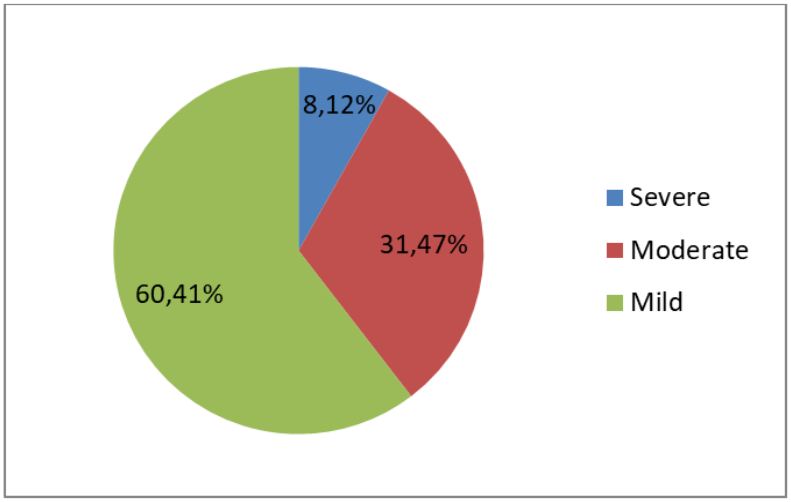

Figure 6: Distribution of patients according to degree of anemia

DISCUSSION

In our series, we found a hospital prevalence of 10.46%. Marie-chantal Ngonde-Essome *et al.,* [4] in her study on anemia and associated pathologies in the general medicine department of the Yaoundé university hospital center had found a prevalence of 20.94%, Hoahy Rasoanandrasana [5] during of a prospective descriptive study of the anemias encountered at the Hematology UPFR of the Center Hospitalier Universitaire Joseph Ravoahangy Andrianavalona in Antananarivo had found a prevalence of 31.66. Ayoub Bouhmou *et al.,* [6] during a 5-year retrospective study in Morocco had identified cases of anemia in years.

The age group of 26 to 35 years was more represented 31.87% in our study. For Ngonde-Essome *et al.,* [4], the under 26s represented the age group most affected by anemia (6.50%) followed by the 26-36 age group (4.25 %). Hoahy Rasoanandrasana [5] found a predominance of anemia in the age group of [45-60] years (20.25%), followed by people aged over 60 (18.24%). Ayoub Bouhmou *et al.,* [6] observed a high frequency in the 56-70 age group.

The average age of our patients was 25 years old in our study. For Ngonde-Essome *et al.,* [4], the average age of patients in the study was 35 ±7.2 years. Hoahy Rasoanandrasana [5] had found an average age of 38 years with extremes of 1 day to 96 years. Ayoub Bouhmou *et al.,* [6] had found the average age of 48.4 years.

The female sex was predominant, 54.31% in our series. Ngonde-Essome *et al.,* [4] had found a prevalence of anemia of 16.68% in women and 4.25% in men. For Hoahy Rasoanandrasana [5], the study population consisted of 671 women and 796 men, with a sex ratio of 1.18. Ayoub Bouhmou *et al.,* [6] had found 64% of women with a sex ratio F/M of 1.78.

Housewives were the largest occupational group with 52.8% In our study. Ngonde-Essome *et al.,* [4] found that students were more anemic (8.40%) followed by workers (6.71%) and housewives (5.83%).

In our study 52.75% of our patients came from rural areas while 47.25% came from urban areas. In the study by El Hioui [7] 61% of patients came from particularly unfavorable socio-economic backgrounds of rural origin, while 39% of patients came from urban areas.

Gastropathy was the most found antecedent 38.58% followed by hypertension 26.90% in our series. For Ayoub Bouhmou *et al.,* [6] the most found antecedent was diabetes with 15 cases.

In our study the main clinical manifestations were: conjunctival pallor 59.9%, vertigo 56.85%, physical asthenia 55.33%, dyspnea 51.26 %, headaches 50.25%. Ayoub Bouhmou *et al.,* [6] found mucocutaneous pallor 123/150, asthenia 110/150, tachycardia 97/150, vertigo 85/150, palpitation 70/150, dyspnoea 35/150.

In our study, the associated pathologies were: hypertension 38.58%, followed by malnutrition 34.01%. Ngonde-Essome *et al.,* [4], found that the associated pathologies were: food deficiency 10.97%, malaria 5.26%, HIV and tuberculosis group 2.68%.

The average hemoglobin level in our series was 8.18 g/dl. Ayoub Bouhmou *et al.,* [6] had found an average hemoglobin level of 8 g/dl.

Biologically, microcytic anemia was the most frequent 64.47%, followed by normocytic anemia 26.90% and macrocytic anemia 8.63% in our study.

Hoahy Rasoanandrasana [5] had found that normocytic anemia was predominant in the order of 64.01%, followed by microcytic anemia 32.11% and macrocytic anemia 3.89%. Ayoub Bouhmou *et al.,* [6] reported 56% microcytic anemia; 23% macrocytic anemia, and 21% normocytic anemia.

Normochromic anemia was more encountered in 52, 79% compared to anemia hypochromic 47.21% in our series. Hoahy Rasoanandrasana [5] found that normochromic anemia constituted 61.76%. Ayoub bouhmou *et al.,* [6] found 67% normochromic anemia and 33% hypochromic anemia.

In our study mild anemia was more frequent 60.41% followed by moderate anemia 31.47% and anemia was severe 8.12%. Ngonde-Essome *et al.,* [4] found 10.07% mild anemia and 0.45% severe anemia. For Hoahy Rasoanandrasana [5], reported 43.22% mild anemia, 33.88% moderate anemia; 15.06% fairly severe anemia and 7.84% severe anemia. Ayoub Bouhmou *et al.,* [6] found 26% mild anemia, 26.6% moderate anemia; 27.3% fairly severe anemia and 20% severe anemia.

CONCLUSION

Anemia remains a frequent, multidisciplinary pathology. It is common in young adult female subjects and subjects living in an unfavorable socioeconomic context. Microcytic and normocytic anemias were the most common types of anemia in the Internal Medicine Unit.

ACKNOWLEDGEMENTS

We thank all the staff of the hospital of Kayes, the CHU Point G, Point G hospital internal medicine department, National Center for Scientific and Technological Research (CNRST) and the Faculty of Medicine of Bamako Mali.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this paper.

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SURVEY SHEET

I-dentification / file number: ……

I - Sociodemographic data:

Q1. Gender: □ 1=Male; 2=Female

Q2. Age ……(year).

Q3. Ethnicity: □ 1=Bambara; 2=Sarakolé; 3=Soninké; 4=Dogon; 5=Fulani; 6=Sound; 7=Bozo; 8=Malinke; 9=Other to be specified 10=not specified

Q4. Nationality: □ 1=Malian, 2=non-Malian, 3=not specified.

Q5. Profession: □ 1=Civil servant; 2=Farmer 3=Housewife; 4=Trader; 5=Craftsman; 6=Retirement;7=Other (specify)……..

Q6. Residence: □ ……

Q7.Sent by: □ 1=Coming by himself 2=Doctor 3=others (specify) 4=Not specified

II-reason(s) for hospitalization:

A=……. B=…….

C=…….

III-Anamnestic data

Q1. Medical: 1=yes 2=no □ UGD □ HIV □ Wound □ Cirrhosis □ IBD □ Epistaxis □ Gastropathy □ Diabetes □ Metrorrhagia □ Hemopathy □ High blood pressure □ Menometrorrhagia □ Viral hepatitis □ Cardiopathy □ Postpartum □ □ Autoimmune disease Stroke □ Melena □ Rectal bleeding □ Repeated blood donation (number to be specified) □ Close pregnancies Others……

Q2. Surgical: ……

Q3. Notion of taking medication: □ 1=yes; 2=no (If yes, specify)

…….

Q4. Lifestyles: 1=yes; 2=no □ Tea □ Coffee □ Liver □ Tobacco □ Alcohol □ Eggs □ Drugs □ Clay □ Milk □ Cereals □ Vegetables □ Fish Others…… ……

IV- Physical examination.

Q1. Functional signs: 1=yes; 2=no □Asthenia □ Dyspnea □ Epistaxia □Anorexia □ Polypnea □ Rectorragia □Weight loss □ Bradypnea □ Melena

□Tinnitus □ Vertigo □ Hematemesis □Abdominal pain □Tachycardia □ Hematuria □Headache □ Lipothymia □ Epigastralgia □Ringing in the ears Other…… …

Q2. Physical signs: 1=yes; 2=no □ Pallor □ Perleche □ Diarrhea □ Leukonychia □ Glossitis □ Vomiting □ Koilonychia □ Splenomegaly □ Diarrhea □ Platonychia □ Hepatomegaly □ Lymphadenopathy □ Anemic breath □ Plum merson syndrome dry and brittle hair □

V-Paraclinical data:

A-Biology

Q1. Complete blood count:

• Hemoglobin: ……g/dl

• VGM……fl.

• TCMH……Pg