OPEN ACCESS
Scholars International Journal of Obstetrics and Gynecology
Abbreviated Key Title: Sch Int J Obstet Gynec
ISSN 2616-8235 (Print) |ISSN 2617-3492 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Severe Anemia during Pregnancy in the Maternity Ward of the Kalabancoro Reference Health Center

Seydou Mariko[1, 2*], Mamadou Haidara[2, 3], Pierre Coulibaly[2, 4], Mahamoud Coulibaly[3], Kalilou Samaké[3], Soumana Oumar Traoré[5, 6], Alou Samaké[2, 7]

[1]Department of Gynecology, Mali Hospital, Bamako
[2]Centre National de la Recherche Scientifique et Technologique, Mali
[3]Department of Obstetrics and Gynecology of the Kalabancoro Reference Health Center, Kati, Mali
[4]Department of Obstetrics and Gynecology of the Sominé Dolo Hospital in Mopti, Mali
[5]Gynecology and Obstetrics Department of the Reference Health Center of the V commune of the District of Bamako, Mali
[6]Faculty of Medicine and Odontostomatology of Bamako, Mali
[7]Gynecology and obstetrics department of the Reference Health Center of the VI commune of the District of Bamako, Mali

DOI: 10.36348/sijog.2022.v05i04.010 | **Received:** 12.03.2022 | **Accepted:** 18.04.2022 | **Published:** 23.04.2022

***Corresponding author:** Seydou Mariko
Department of Gynecology, Mali Hospital, Bamako

Abstract

Introduction: The main objective was to determine the maternal and fetal consequences of severe anemia in pregnancy at the maternity ward of the Kalabancoro Reference Health Center. ***Methods***: Our descriptive cross-sectional study with prospective data collection was conducted from January 1, 2019 to September 30, 2019 at the maternity ward of the Kalabancoro Health Center. Eligible patients were all consenting pregnant women presenting for prenatal consultation or in the delivery room in which the diagnosis of severe anemia was retained. The anemia was considered severe when the hemoglobin level was less than 7 g/dl and/or with clinical manifestations of decompensation of the anemia. Data were processed and analyzed by SPSS 12 software. ***Results:*** A total of 161 cases out of 2010 pregnant women were recruited and treated at the Kalabancoro Health Center, which represents a prevalence of 8% of severe anemia in pregnancy. The 14-19 year age group was the most representative, i.e. 52.2% of pregnant women, with extremes of 14 to 35 years and over. Malaria was the most predominant etiology with 31.05% followed by blood spoliation 25.47% and malaria plus malnutrition 14.29%. Prematurity represented 5% of cases. Maternal death was 1.9%. Low birth weight was 16.7% and stillbirths represented 3.7%. ***Conclusion*:** Severe anemia in pregnancy remains, through its complications, one of the most dreaded pathologies. Thus, a prospective analytical study is necessary to better study the causes of severe anemia in pregnancy.

Key words: Anemia, consequences, pregnancy, prevalence.

INTRODUCTION

Anemia in pregnancy is defined as a hemoglobin level below 11g /dl. Severe anemia in pregnancy is defined as a hemoglobin level of less than 7g /dl [1, 2]. It is the ultimate expression of iron deficiency, which is the cause in more than 50% of cases. Other causes include infectious causes (malaria and other parasitic infections), other nutritional deficiencies, sickle cell anemia, aplastic anemia, inflammatory anemia and anemia due to blood loss; very often, the origin is multifactorial [1, 2].

It is a disorder of variable severity to which 17% to 31% of pregnant women in developed countries and 52.8% to 61.3% in sub-Saharan Africa are exposed [1, 2, 3]. Some studies report prevalences of 16.8%, 22.1%, 24.4%, 32.8%, 41.6% and 100% respectively in Iran, Uganda, Great Britain, Ethiopia, Turkey and India [4-6].

In Mali, it should be noted that the prevalence of severe anemia is highest among pregnant women (6%) and among women in the regions of Kayes and Koulikoro (4%) [5,6]. Severe maternal anemia during pregnancy is therefore likely to have dramatic

consequences by increasing the risk of maternal and neonatal mortality [6]. Different studies carried out in Bamako have shown that 30 to 65% of pregnant women were anemic. A survey conducted in 2005 in the district of Bamako reported that 73% of anemia cases in women were largely due to iron deficiency [7].

The risk factors for anemia in pregnancy vary considerably from one setting to another. In the study by Taner et al, the factors found were multiparity, low level of education, low monthly income, late antenatal consultation and short duration of iron supplementation during pregnancy [6, 7, 18]. In the British study by Barroso et al, these were young age, non-white ethnicity and multiparity [6,7, 18]. Anemia is a significant risk factor for maternal and especially fetal morbidity (in utero growth retardation, prematurity and perinatal mortality) [18].

At the time this study was initiated, no study had been conducted on anemia associated with pregnancy in the Kalabancoro health center. The main objective of our study was to determine the maternal and fetal consequences of severe anemia during pregnancy, and secondly, to list the main etiologies of these anemias in the maternity ward of the Kalabancoro referral health center.

METHODS

Our descriptive cross-sectional study with prospective data collection was conducted from January 1 to September 30, 2019, at the Kalabancoro Reference Health Center, Kati, Mali. It included all pregnant women seen in prenatal consultation or in the labor room and whose pregnancy outcome was known or not. The diagnosis of anemia was made biologically by measuring the hemoglobin level. Anemia was considered severe when the hemoglobin level was below 7 g/dl with or without signs of clinical intolerance. Eligible patients were all pregnant women admitted to the Kalabancoro Reference Health Center for severe anemia in pregnancy (hemoglobin level < 7 g/dl and/or clinical manifestations of decompensated anemia) who agreed to participate in our study. Non-inclusion criteria included pregnant women admitted for severe anemia who were discharged against medical advice and whose outcome was unknown. The sample size was calculated according to the

Schwartz formula

The minimum sample size $n= (Z\alpha)^2 x \frac{PQ}{i^2}$

Z: standard deviation=1, 96 p : probability of the event studied, q : complementary probability of p, i=: precision =5%.

Considering a frequency of 32.7% of severe anemia in pregnant women in the city of Kayes in Mali according to Tounkara MD [10], the sample size needed for our work was 338 with an alpha risk of 5% and a precision of 5%. We had done an exhaustive sampling including all pregnant women seen at the Kalabancoro Reference Health Center (CSRéf) during the study period. This allowed us to include 2010 pregnant women.

An individual survey form previously established and pretested was used as a data collection tool. The sources of our data were obstetrical records; mother and child health records; partographs; delivery records; hospitalization records and operative reports. We conducted an individual interview to collect socio-demographic information and clinical signs of the patients. Then weight, height and blood pressure were measured with well-calibrated devices. Weight was measured with a SECA 761 medical scale. The scale for height measurement was the SECA 213 mobile height gauge.

We used a SPENGLER blood pressure monitor. Afterwards, a complete physical examination was carried out device by device, including a thorough gynecological examination. The results were recorded on the investigation form and in the individual patient file. If necessary, the surgical, hospitalization and delivery records were read for additional information. The variables used were grouped into sociodemographic variables (age, profession, origin, marital status), clinical variables (parity, gestational age, inter-genital interval, prenatal consultation, etc.) and paraclinical variables (blood count, thick blood drop, hemoglobin level). Data were processed and analyzed by SPSS 12 software.

The YATE'S Kh2 test was used to compare proportions and the significance level was set at 0.05%. Informed consent was obtained from the patients before administration of the questionnaire and anonymity was maintained.

RESULTS

From January 1 to September 30, 2019, we recorded 1600 cases of anemia in pregnancy, including 161 cases of severe anemia in 2010 pregnant women treated at the Kalabancoro Reference Health Center (CSRéf), representing a frequency of 8% of severe anemia in pregnancy.

The analysis of the data showed that the 14-19 year age group was the most representative with 52.2% of pregnant women. Four fifths (82%) of the pregnant women were married. Housewives represented 2/5 (41.6%) of the cases and about the same proportion, i.e. 2/5 (40.4%) of the pregnant women had a secondary education. This information is presented in Table 1 below.

Table-1: Socio-demographic characteristics of patients

Variables	Number	Percentage (%)
Age range		
14-19 years old	84	52,2
20-34 years old	55	34,2
≥35 years old	22	13,6
Total	161	100,0
Marital status		
Married	132	82,0
Single	29	18,0
Total	161	100,0
Profession		
Housewife	67	41,6
Civil servant	33	20,5
Businesswoman	61	37,9
Total	161	100,0
Level of education		
No schooling	56	34,8
Primary level	40	24,8
Secondary level	65	40,4
Total	161	100

2/5 or 80% of the pregnant women used insecticide-treated nets. Nulliparous women were the most represented with 27.3% of the pregnant women and the average parity was 6. On the other hand, pauci gestes were the most represented with 31.1% of the pregnant women and the average parity was 7. Nearly ¾ of the pregnant women had an inter reproductive interval ≥ 2 years or 72%. To note that 27.3% of the pregnant women were nulliparous (n=44). Nearly 1/5 of the pregnant women had presented bleeding (metrorrhagia), i.e. 17.4% of the cases (n=28) and tachycardia plus mucocutaneous pallor was the most represented sign of anemia, i.e. 59%. The main etiology of anemia was malaria followed by blood spoliation and malaria plus malnutrition with respectively 31.05%; 25.47% and 14.29%. Thus, we found that anemia due to martial deficiency is the most frequent anemia, the main causes of which are iron malabsorption, malnutrition, chronic digestive and gynecological bleeding and intake deficiencies. Table 2 shows the details of the above information

Table-2: Clinical characteristics of the patients

Variables	Number	Percentage (%)
Use of insecticide-treated nets		
Yes	129	80,1
No	32	19,9
Total	161	100,0
Gestité		
Primigeste	41	25,5
Pauci gesture	50	31,1
Multi gesture	44	27,3
Great multi gesture	26	16,1
Total	161	100,0
Parity		
Nulliparous	44	27,3
Primiparous	29	18,0
Pauci pare	34	21,1
Multipare	39	24,2
large multiparous	15	9,4
Total	161	100,0
Intergenital interval (months)		
< 12	1	1
24 and more	116	99
Total	117	100
Prenatal consultations		
Yes	156	96,9
No	5	3,1
Total	161	100,0
Signs of anemia		
Pallor	15	9,3
Tachycardia +pain	95	59
Tachycardia +pain +exertional dyspnea +organic systolic murmur +lower extremity edema	51	31,7
Total	161	100,0
Prenatal consultations		
Yes	28	17,4
No	133	82,6
Total	161	100,0

Cause		
Malaria + malnutrition	23	14,29
Malaria	50	31,05
Urinary tract infection	7	4,35
Intestinal parasitosis	8	4,97
Malaria + intestinal parasitosis	12	7,45
Malaria + urinary infection	20	12,42
Blood spoliation	41	25,47
Total	161	100

Table-3: Distribution by patient management

Variables	**Number**	**Percentage (%)**
Number of blood bags transfused		
0	10	6.21
1	50	31.06
2	90	55.90
3	11	6.83
Total	161	100,0
Post-transfusion control hemoglobin level		
≤7g/dl	10	6,62
≥8g/dl	141	93,35
Total	151	100
Drug therapy		
Iron folic acid	15	9,3
Iron folic acid +Anti-malarial	73	45,3
Iron folic acid + Antibiotic	30	18,6
Iron + folic acid + antimalarial + antibiotic	43	26,8
Total	161	100,0
Pregnancy outcome		
full term delivery	125	77,6
premature delivery (28SA-36SA)	8	5,0
death in utero/pregnancy (>20SA)	7	4,3
abortion	3	1,9
Unknown	18	11,2
Total	161	100,0
Route of delivery		
vaginal delivery	115	71,4
High route	24	14,9
Undetermined	22	13,7
Total	161	100
Birth weight		
<2500g	27	16,7
≥2500g	112	69,6
Indeterminate	22	13,7
Total	161	100
Apgar score at the 1st minute		
0	6	3,7
1-3	2	1,2
4-7	8	5,1
8 -10	122	75,7
Indeterminate	23	14,3
Total	161	100,0
Maternal death		
No	158	98,1
Yes	3	1,9
Total	161	100,0

More than half (55.9%) of the pregnant women had received a transfusion of two bags of iso rhesus blood, 31.06% had received a transfusion of one bag of blood and 6.83% of the pregnant women had been transfused three times. There was a satisfactory improvement in the hemoglobin level (≥ 8g/dl) at the

first post-transfusion control, i.e., 9/10 (93.35%) of the pregnant women. All the pregnant women had received martial treatment but more than 2/5 (45.3%) of the pregnant women had been treated with added iron and antimalarial drugs. More than ¾ of the pregnant women, i.e. 77.6%, had delivered at full term and vaginal delivery was the most common method of delivery with 71.4% of cases. Low birth weight accounted for almost 1/5 of births (16.7%).

Neonatal mortality was 3.7% and maternal mortality was 1.9%. It should be noted that all these deaths occurred during pregnancy and all our pregnant women had a negative Emmel test.

Table-4: Relationship between hemoglobin level and bleeding

Bleeding	Hemoglobin level	
	≤ 3	4-6
Metrorrhagia	5	23
No Metrorrhagia	2	131
Total	7	151

Fisher's p-value: 0.0018.Our study had an association between hemoglobin level and bleeding [P<0.05].

DISCUSSION

The limitations of our study were the lack of information on the hemoglobin level of our patients before pregnancy, on the fate of women with anemia in the gravid-puerperal period who were transfused or put on iron supplementation. Finally, the characteristics of the anemia on the blood count were not shown, but rather the hemoglobin level.

The prevalence of severe anemia during pregnancy at the Kalabancoro Health Reference Center during our study period was 8% (Table 1). In the literature, other authors have found different prevalences in similar studies. 11.35% for Guindo S [5], 31.5% for Camara D [6]. The differences observed could be explained by differences in methodologies, especially those related to the study period and sample size. In our study, the epidemiological profile was more represented by women in the 14-19 age group (52.2%), married (82%), housewives (41%) and with a high school education (40.4%) (Table 1). Camara D. [6] found that the 20-34 age group was the most represented (56.10%). The size of the sample could explain most of this difference compared to our study (289 cases/917). In our study, married women were the most concerned, which was similar in Charlotte's study, i.e. 80.7% [19] versus 82% (Table 1). Women with secondary education were the most represented in our study, which contrasted with those with higher education in Charlotte Nguefack Tchente et al. This difference would be related to the educational level of the populations studied.

43.4% of our women were in their fourth pregnancy or more, while Tounkara M D [10] found 51.5% of multiparous women. Our study did not find a link between the frequency of anemia and gestational age, as did Sidibé H [7], Ouattara Z [9] and Lamine D [11] who did not find a link between anemia and parity, unlike Tounkara MD [10] who found a link between anemia and gestational age.

59% of our patients presented with pallor + tachycardia (95/161) among which 55 pregnant women were referred, i.e. 34.2% of pregnant women (55/161) (Table 2). At the Kalabancoro Reference Health Center (CSRef), the diagnosis of pallor of the integuments during an antenatal consultation required an internal referral. The patients referred to us were accompanied by their midwife with the result of the hemoglobin level. Tounkara md [10] reported 11.4% referral of pregnant women by midwives, which was well below our rate. The difference could be explained by the low rate of attendance at antenatal clinics in the study by Tounkara MD [10].

In our study we recorded 1.9% of maternal deaths (3/161). In the literature, other authors such as Camara M. and Tounkara M D reported higher maternal mortality rates with respectively 4, 6% and 4.5% of cases. According to the literature, in an anemic pregnant woman, the blood loss that would accompany a normal delivery could lead to maternal death [3,4, 6,7,9,10]. Thus, in order to minimize blood loss related to childbirth, active management of the third stage of labor (AMTSL) was systematic at the Kalabancoro Health Center (national protocol). On the other hand, in our study we recorded 4.3% (7/161) of fetal death in utero due to anemia (table 3), which was lower than those of Tounkara MD [10] and Lamine D [11] who found 11.4% and 4.9% respectively. In their studies, cases of fetal death in utero always occurred in a context where the hemoglobin level was below 4g/dl. Prematurity represented 5% (8/161) (Table 3) in our study, which was much lower than the rates reported by other authors such as Tounkara MD [10] and Lamine D [11] who respectively found 15.3% and 15.50%. All our patients had benefited from a hemoglobin determination. This approach was the same for Tounkara MD [10], Lamine D [11] and Diakité G [12].

In our study, all our pregnant women had performed an Emmel test which came back negative. 93.79% (151/161) of our pregnant women had received a blood transfusion for a hemoglobin level <7g/dl or clinical intolerance of anemia. This rate was slightly

higher than those of Tounkara MD [10] Lamine D [11] which were respectively 91.60% and 91.30%. The indication for transfusion was based on the clinical tolerance of the anemia on the one hand and on the hemoglobin level on the other. Thus, a hemoglobin level below 7g/dl, even when the anemia is well tolerated, the pregnant woman should be transfused in order to ensure a good nutritional status for the fetus. On the other hand, for hemoglobin levels ≥7g/dl there was the problem of the term of pregnancy when we were far from the term and the anemia was clinically tolerated the transfusion was not systematic, on the other hand towards the term we transfused to foresee bleeding related to the normal delivery. At the Kalaban Coro Health Center, pregnant women were systematically given folic acid from the moment of conception and iron folic acid from the second trimester. The daily prophylactic doses were 120 mg for elemental iron and 500 micrograms for folic acid. Prophylaxis lasts during gestation and 3 months after delivery. This treatment concerns pregnant women whose condition did not require a blood transfusion. At the Kalaban Coro Health Center, iron, folic acid and often vitamin B12 and B6 were prescribed at the same time at a dosage of 120 to 200 mg for iron, 500 micrograms of folic acid and 3 micrograms of vitamin B12. It should be noted, however, that the search for and control of the cause of the anemia remained essential.

CONCLUSION

Severe anemia in pregnancy represented 8% of pregnant women in our study. It remains one of the most dangerous pathologies in obstetrics through its complications. The main causes were related to blood spoliation or malaria and therefore martial deficiency. Prenatal consultations were an effective way to detect and treat severe anemia during pregnancy in our study.

Conflicts of interest

The authors declared no conflicts of interest.

Contribution of the authors

The design of the study was provided by Mahamoud Coulibaly and Mamadou Haidara. Seydou Mariko was responsible for writing the article. All authors had participated substantially in the development of this manuscript until its submission. All authors had read and approved the manuscript before its submission for publication.

REFERENCES

1. Who/CDC Worldwide prevalence of Anemia 1993-2005 Who global Data base on Anemia. Geneva, Switzerland:who press;2008.(http:/apps.who.int/iris/bitstream/10665/43894/1/ 9789241596657 eng.pdf)
2. Gentilini, M. (1993). Médecine Tropicale, Flammarion 5th edition, Paris, 928P, 26 cm.
3. WHO/IAEA/USAID Combating nutritional anemia with special reference to iron deficiency, Technical Report No. 580, 1975, 77.
4. WHO. (1982). Prevalence of nutritional anemia among pregnant women in developing countries: critical studies, World Health Statistics Quarterly Report No. 2.
5. Guindo, S. Maternal-fetal prognosis of anemia associated with pregnancy in the gynecological-obstetrical service of the Centre de Santede Référence de Bougouni, Mali
6. Camara, D.M. (2021). Severe anemia in pregnancy at the Csref of Kéniéba. Medical thesis, Bamako, 2021M272
7. Sidibé, H. (1996). The anemia of the mother/newborn couple in Bamako, place of iron and folate deficiency. Thesis of medicine, Bamako,124 No17
8. Meda, N., Dao, Y., Touré, B., Yameogo, B., Cousens, S., & Graham, W. (1999). Assessing severe maternal anemia and its consequences: the value of a simple examination of the coloration of palpebral conjunctiva. *Sante (Montrouge, France)*, *9*(1), 12-17.
9. Zanafon, O. (1982). *Contribution à l'étude des anémies chez la femme enceinte dans le District de Bamako* (Doctoral dissertation, Thèse de Doctorat en Médecine, Ecole Nationale de Médecine et de Pharmacie. Bamako).
10. Tounkara, D.M. (2011). Severe anemia in pregnancy at the Fousseyni Daou hospital in Kayes. Thesis of medicine, Bamako, M125
11. Lamine, D. (2013). Epidemioclinic and therapeutic study of anemia in pregnancy at the csref of kadiolo Thesis of medicine Bamako, M145
12. Diakité, G. (2005). Epidemioclinical and therapeutic study of anemia in pregnancy about 120 cases at the reference health center of the commune V of the District of Bamako. Thesis of medicine, Bamako, 45P Nº 133.
13. Journal of Obstetrics Gynecology and Reproductive Biology vol 33-n 6- C1 P .506-509October2004 EM consult: Severe maternal anemia and pregnancy outcomes Medical Thesis 2018-2019
14. Giphar pharmacists: Anemia in pregnancy: - Prepartum anaemia: prevention and treatment. Ann Hematol.2008 dec -Recommendations of the nutrition health program.
15. W. El Guindi. Severe maternal anemia and pregnancy outcomes
16. AFIFI, Oumaima anemia and pregnancy URI: http://hdl.handle.net/123456789/17441 Date: 2019
17. L. NIKIÉMA. Nutritional determinants of anemia in pregnant women and pregnancy outcome in urban Burkina Faso
18. B. Ilboudo. Factors Associated with Severe Anemia of Pregnancy in Hospital Settings in the Cascades Region of Burkina Faso
19. Charlotte Nguefack Tchente. Prevalence and factors associated with anemia in pregnancy at the Douala General Hospital