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Original Research Article

Obstetric Evacuations Received At the "Major Moussa Diakite" Referral Health Centre in Kati, Republic of Mali

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Abstract: The organisation of the evacuation referral system is an important strategy for reducing maternal and perinatal mortality in Mali. ***Objective*:** To study obstetric evacuations received in the gynaecology and obstetrics department of the "Major Moussa DIAKITE" referral health centre in Kati. ***Method*:** We conducted a cross-sectional, descriptive and analytical study. Data were collected retrospectively and prospectively over a 12-month period (from 1 January to 31 December 2020). Sampling was exhaustive and included all cases of obstetric evacuation received and managed on site during the study period. ***Results*:** Out of a total of 3050 deliveries, we received and managed 352 cases of obstetric evacuation, representing a frequency of 11.5%. The average age of the patients was 25 years, with extremes of 15 and 44 years, although the 20-34 age group was dominant, accounting for 73.6% of cases. The majority of evacuees were housewives (86.4%), married (92%), nulliparous and primiparous (52%). Dystocic labour was the most common reason for evacuation (51.1%), followed by ante-partum haemorrhage (13.4%). Nearly nine out of ten women evacuated came from Community Health Centres (89.8%) and the most common means of evacuation was by ambulance (52.1%). The average time from admission to the start of care was 26.5 minutes, with extremes of 3 and 50 minutes. Delivery by the vaginal route was carried out in almost eight out of ten cases (79%). Newborns were resuscitated alive (7.9%); stillbirths were fresh (3.7%) and stillbirths were macerated (06%). We recorded 2 cases of maternal death (0.6%) and the causes of maternal death were haemorrhage due to uterine rupture and eclampsia. ***Conclusion*:** The improved organisation of the evacuation referral system in our facility has improved the maternal and, above all, foetal prognosis of obstetric evacuations, but more needs to be done.

Keywords: Obstetric Evacuation, Maternal and Foetal Prognosis, Kati Referral Health Centre.

INTRODUCTION

Every minute of every day, somewhere in the world, a woman dies from complications of pregnancy and childbirth, and most of these deaths are preventable [1]. According to a report by the United Nations Development Programme, of all the health-related human development indicators, maternal and infant mortality rates show the greatest disparities between industrialised and developing countries [2]. According to estimates by the World Health Organisation (WHO), there were around 295,000 maternal deaths worldwide in 2017, 86% of which occurred in developing countries, with sub-Saharan Africa alone accounting for 66% [3]. Obstetric complications are the main cause of maternal mortality and morbidity [4]. In the United States, France and other European countries, the maternal mortality index varies from 1 to 10 per 100,000 live births [1], while in several developing countries it ranges from 500 to 2,000 per 100,000 live births [5]. In Mali, according to the Demographic Health Survey (EDSM) VI [6], maternal mortality is estimated at 325 maternal deaths per 100,000 live births. The organisation of the evacuation reference system based on the cost-sharing

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system is an integral part of the strategy to reduce maternal and neonatal mortality. In 1994, the WHO emphasised the importance of the referral and counter-referral system for pregnancy and childbirth care, which is defined as all the measures taken to enable a patient to be referred from a lower level to a higher level with better skills to ensure better care [7]. In developing countries such as ours, the frequency of obstetric evacuations varies, as shown by the following studies: in 2015 at the Yaoundé gynaeco-obstetric and paediatric hospital in Cameroon, obstetric evacuations accounted for 37.63% of admissions [8]. In 2015 in Senegal, 31.2% of obstetric emergencies admitted to the maternity ward of the Ndioum regional hospital were evacuations, with 2% of maternal deaths [9]. In Mali in 2006 at the Centre de Santé de Référence de Koulikoro [10], the frequency was 31.8% with maternal and neonatal mortality rates of 3% and 16%. It was 17% in 2015 at the Centre de Santé de Référence de la Commune V, with maternal and neonatal mortality rates of 2% and 11% [11]. According to a 1st study carried out at the Kati Reference Health Centre in 2014, the frequency of obstetric evacuations was 11% with 0.6% of maternal deaths and 10.6% of neonatal deaths [12], whose prognosis depended on the speed of decision-making, transport conditions and reception at the destination centre. In order to evaluate the level of evolution in relation to this last study, we have initiated the present study, the objectives of which are as follows: to determine the frequency of obstetric evacuations; to describe the characteristics of the women evacuated and to study their prognosis and that of the newborns.

MATERIALS AND METHODS

Our study took place in the maternity ward of the "Major Moussa Diakité" referral health centre in Kati. This is a second-level referral facility in Mali's health pyramid. It is one of the largest health districts in Mali's second administrative region (Koulikoro). It is a health district with forty-five functional health areas in 2020. Almost half of the health facilities in these areas refer their patients directly to the "Major Moussa Diakité" referral health centre in Kati. Our facility has a functional operating theatre and all the equipment needed for obstetric surgery. We conducted a cross-sectional, descriptive and analytical study from 1 January to 31 December 2020, a period of 12 months. It covered all women who were seen for obstetric reasons in the obstetrics and gynaecology department of the "Major Moussa Diakité" referral health centre in Kati during the study period. We proceeded to an exhaustive sampling taking into account all the cases meeting our criteria, which enabled us to have 352 cases. We included in this study all patients evacuated for obstetrical reasons with a justification for the evacuation whose care took place at the Kati referral health centre during the study period. Data were entered using Word and Excel 2013, and analysed using SPSS version 25. We used Pearson's Chi-square test and Fisher's exact test, with a statistically significant threshold if the P value was less than 0.05.

RESULTS

During the study period, we received and managed 352 cases of obstetric evacuations out of 3050 deliveries, or a frequency of 11.5%.

Table I: Distribution of patients according to socio-demographic aspects

Socio-demographic characteristics	Number (N=352)	Percentage (%)
Age		
≤19 years	50	14,2
[20-34 years]	259	73,6
≥35 years	43	12,2
Matrimonial status		
Married	324	92
Unmarried	28	08
Level of education		
Out of school	239	68
Primary	42	12
Secondary	67	19
Superior	4	1
Profession		
Housewife	304	86,4
Saleswoman / merchant	29	08,2
Pupil / Student	18	05,1
Hairdresser	01	0,3
Parity		
Nulliparous	112	31,8
Paucipare (2 to 3 parities)	71	20,2
Multipare (4 to 5 parities)	91	27,6
Large multiparous (≥ 6 parity)	37	29,1

The average age was 25, with extremes of 15 and 44

Table II: Distribution of patients according to facilities and means of evacuation

Structures and means of evacuation	Number (N=352)	Perrcentage (%)
Evacuation structures		
Community health centre	316	89,8
Private structures	19	5,4
Rural maternity units	7	4,8
Means of transport		
Ambulance	183	52,1
means of public transport	16	4,5
Motorbike	120	33,2
Personal vehicle	36	10,2

Table III: Distribution of patients by reason for evacuation

Reason for evacuation	Number (N=352)	Percentage %
Dystocic labour	180	51,1
Antepartum haemorrhage	47	13,4
Hypertension and complications	29	8,2
History of caesarean section	25	7,1
Post-partum haemorrhage	17	4,8
Procidence of the cord	3	0,9
Premature rupture of membranes	12	3,4
prenatal consultation not carried out	15	4,3
Size less than 1 metre 50 centimetres	11	3,1
Anaemia in pregnancy	5	1,4
Seat presentation	5	1,4
*Other	3	0,9

Other: at parents' request (1) ; highly desired child (1) ; unperceived foetal heart sound (1)

Table IV: Distribution of patients by diagnosis on admission

diagnosis retained	Number	Percentage (%)
normal progress of childbirth	177	50,3
Dystocic childbirth	43	14,5
Acute foetal suffering	11	3,1
hypertension, pre-eclampsia, eclampsia	15	4,3
Seat presentation	12	3,4
Uterine scar(s)	26	7,4
Postpartum haemorrhage	21	6,0
Procidence of the cord	10	2,8
Placenta previa	7	2,0
Threat of premature birth	7	2,0
Retro-placental haematoma	4	1,1
Anaemia in pregnancy	8	2,3
Uterine rupture	1	0,3
fœtal death in utero	2	0,6

- The reason for evacuation and the diagnosis were not concordant in seven out of ten patients (71.1%).
- The average distance travelled during evacuations was 22 kilometres, with extremes ranging from 5 to 180 kilometres.
- The average time from admission to the start of care was 26.5 minutes, with extremes of 3 minutes and 50 minutes.
- The most common method of delivery was vaginal delivery (79%), compared with caesarean section (21.1%).
- The types of complications found were: anaemia 31 cases (8.8%); eclampsia 4 cases (1.1%); haemorrhage 13 cases (3.6%); parietal suppurations 2 cases (0.6%);
- We recorded two cases of maternal death (0.6%), including one case of haemorrhage due to uterine rupture and one case of post-partum eclampsia.
- It should be noted that 309 cases (87.8%) of newborns were discharged alive without resuscitation.

Table V: Relationship between route of childbirth and condition of newborns

childbirth route	Condition of newborn babies				Total (%)
	alive but not reanimated (%)	alive reanimated (%)	dead born fresh (%)	Born dead and macerated (%)	
Low track	255	12	9	2	278
	(82,5%)	(42,9%)	(69,2%)	(100,0%)	79,0%
Caesarean section	54	16	5	0	74
	(17,5%)	(57,1%)	(30,8%)	(0,0%)	21,0%
Total	309	28	13	2	352
	100,0%	100,0%	100,0%	100,0%	100,0%

Fisher =11,235 ddl=3 P=0.006

Table VI: Relationship between evacuation time and APGAR score

Apgar score	Duration of evacuation in hours				Total (%)
	<1Hour (%)	[1 -2]Hour (%)	[3- 4]Hour (%)	> 4Hour (%)	
0	2	5	2	6	15
	(1,6%)	(4,3%)	(2,6%)	(11,8%)	4,3%
4-7	4	6	6	12	28
	(3,2%)	(5,2%)	(7,7%)	(35,3%)	7,9%
8-10	119	104	70	16	309
	(95,2%)	(90,5%)	(89,7%)	(47,1%)	87,8%
Total	125	115	78	34	352
	100%	100%	100%	100%	100%

Fisher= 15,607ddl= 3; P=0.001

DISCUSSION

The frequency of obstetric evacuations varies from one study to another depending on the organisation of the referral/evacuation system in the area concerned. In our study, this frequency was 11.5% out of 3050 deliveries. This frequency observed in our study was much higher than in some studies carried out in Bamako; Dao SZ *et al*., [13]. 7.65% in 2018 in commune II in Bamako; Togola M [14]. 10.74% in 2015 in commune VI in Bamako. This rate was much lower than other African studies; A. Sepou *et al*., [15]. 27.3% in 2000 in the Central African Republic; Thiam O [9]: 31.20% in 2015 in Senegal; Samaké A *et al*., [16]. 24.60% in 2020 in Bamako. Atade *et al*., [17], in 2022 at the Banikoara district hospital in Benin, where obstetric referrals accounted for 55% of admissions. Unlike the latter, our study concerned patients evacuated solely for obstetric reasons, that is to say in an emergency context. Unlike referrals where there is no vital emergency for either the mother or the foetus. However, this diversification of the frequency of evacuations depends on the study area, the recruitment method and the density of the study population. Our predecessor in the same structure in 2014, Traoré A.T [12], had obtained a frequency of 11%. This slight increase can be explained by an increase in the population of childbearing age, which has made it more difficult to provide care in community health centres, despite efforts to expand health infrastructure from 40 to 45 health areas between 2014 and 2020. The mean age of the patients was 25 years with extremes of 15 and 44 years, however the 20-34 age group was dominant with 73.6% of cases. This rate was similar to those of Camara W [18], and Dembélé BS [11], with rates of 77.4% and 72% respectively for the same age group and mean ages of 26.17+/-6.214 and 24+/- 9.2 years. Samaké A *et al*., [16], and A Sepou *et al*., [15], reported respectively a mean age of 26 years with extremes [15 and 44] years and 24 years with extremes [13 and 60] years. In the latter study, gynaecological pathologies were included, unlike ours, which only included obstetric evacuations. These different results could be explained by the fact that this period corresponds to one of intense obstetrical activity. Married women represented 92.3% of our patients; this rate was very similar to those of Sall LA [20], Dembélé H [19], and Maiga I.B [21], who reported 94.8%, 92.8% and 93.5% respectively, whereas single women represented 7.7% in our series. Nearly seven out of ten of our patients (68.2%) had no schooling; this finding was similar to that of Dao SZ *et al*., [13], where 56.3% of patients had no schooling. This could be explained by the low school enrolment rate among girls, especially in rural areas. Housewives were in the majority with more than nine out of ten cases (86%) of our patients; this rate was slightly lower than that of Macalou B [22], (92.8%) and Fall G [23], (92.8%) Dao SZ *et al*., [13], (63.2%).

Nulliparous women (32.1%) and grand multiparous women (29.1%) represented more than six out of ten of our patients. These results are comparable to those of Kouyaté H [24], and Touré S [25], where primiparous women represented 32.58% and 36.40% respectively.

In our study, the ambulance was the means of transport most used by our women in 52% of cases, and these patients came mainly from community health centres. Coulibaly A [26], in Bla reported that 100% of

obstetric evacuations were carried out by ambulance, Diarra D.S [27] in San (86.6%); Dao SZ *et al*., [13], in commune II in Bamako (71%). Our rate could be explained by the insufficient number of ambulances to meet the needs on the one hand, and on the other hand the non-payment of co-payments by certain town halls and communities, thus preventing the solidarity fund from effectively fulfilling its commitment to the population.

Patients were evacuated for reasons unrelated to the actual diagnosis. In this study, the most frequently cited reasons for evacuation were: dystocic labour with (48.3%), haemorrhage (13.3%), arterial hypertension and its complications (8.2%), previous caesarean section (7.1%). These results are similar to those of Traoré Y [28], in Nioro where evacuations were motivated by: haemorrhage (19.34%), dystocic labour (16.46%), eclampsia (14.34%) and those of Savadogo S [29], at the Point G university hospital reported that the most frequent reasons for evacuation were: haemorrhage (26.8%), arterial hypertension and its complications (22.3%), painful uterine contractions (11.9%).

The diagnosis was not consistent with the reason for evacuation in seven out of ten of our patients (71.1%). This rate was close to that of Coulibaly A [26], in Bla (76.3%) but higher than that reported by Maiga I.B [21], in the CSRéf of Commune V (31.9%). As for Dao SZ *et al*., [13], in commune II in Bamako, there was a discrepancy between the reason for referral for evacuation and the diagnosis made at the centre in 55.5% of cases. The referral facilities for evacuation were mainly community health centres and were managed by staff who need constant retraining in the detection and management of obstetric emergencies.

Patients arriving at the Kati referral health centre were first examined by the doctor and the entire team on duty. At the end of this examination, the main diagnoses retained in contradiction with the reasons for evacuation were: labour progressing normally (50.3%), labour dystocia (14.5%), uterine scarring (7.4%), post-partum haemorrhage (6%), arterial hypertension and its complications (4.3%). These results are superimposed on those of Maiga I.B [21], normal progress labour (34.1%), dystocia (19.9%), arterial hypertension and its complications (15%) and post partum haemorrhage (6.8%). Camara W [18], obtained normal labour (46.9%), dystocia (18.1%) and foetal asphyxia (9.1%). The high frequency of dystocia in our study could be partly explained by the lack of early detection of risk factors related to pregnancy and childbirth during the last trimester of pregnancy and inadequate monitoring of labour by the partographer.

The average distance travelled during evacuations was 22 km with extremes ranging from 5 to 180 km. This rate was comparable to that of Touré S [25], where 26.4% of patients travelled an average distance of 20 km with extremes of 0 km and 105 km. This result may be due to the fact that most of the patients came from the CSComs, which are staffed by matrons, obstetric nurses and sometimes midwives with some in-depth knowledge of screening for risk factors and complications of pregnancy.

The average time from admission to the start of care was 26.5 minutes, with extremes of 3 minutes and 50 minutes. This could be explained by the delay of the staff in charge of transporting the patient from the ambulance to the clinical examination room, the unavailability of emergency kits and the unavailability of the only anaesthetist at the time.

In nearly eight out of ten cases (79%), vaginal delivery was the most common mode of delivery. A similar finding was made by Dao SZ *et al*., [13], in Commune II, Bamako, where normal delivery was observed in 61.4% of cases. However, contrary to Samaké A *et al*., [16], caesarean section was the most common method of delivery with 65.66%.

Certain indications for caesarean section should have been a planned caesarean section if the pregnancy was well monitored and the patients should have been referred in a non-emergency situation. The main indications for caesarean section were mechanical dystocia (41.8%), multi-scar uterus (31.0%), acute foetal distress (12.2%), post-partum haemorrhage (6.8%), procidence of the beating cord (4.1%) and retroplacental haematoma (4.1%). For Samaké A *et al*., [16], the main indications for caesarean section were dystocia 55.86 followed by acute foetal distress 30.43%.

We observed 28 cases of live resuscitated newborns (7.9%) compared with 13 cases of fresh stillbirths (3.7%) and 2 cases of macerated stillbirths (06%). The better the vaginal delivery, the better the condition of the newborn (P=0.006). These resuscitated newborns were mainly born by caesarean section, which would explain the urgent nature of the evacuation. There was a significant relationship between the duration of evacuation and the Apgar score at birth (P=0.001); the shorter the duration, the better the Apgar score. Our rate of neonates resuscitated is lower than those found by Camara W [18], at the commune V reference health centre and Soumouthéra M [30], in Koutiala, respectively (23.9%) and (33.33%). This fresh stillbirth rate is lower than that reported by Maiga M.I [31], at Point G, i.e. 16.3%.

For Samaké A *et al*., [16], antenatal death accounted for 25.42% of cases; early neonatal death was observed in 23 cases (0.79%) and the Apgar score in the first five minutes of extra uterine life was eight out of ten in 70.9% of newborns. These results could be explained by the increase in the number of qualified staff at the CSComs, enabling a rapid decision to be taken on evacuations, and the contribution of rural maternity units

in monitoring and screening high-risk pregnancies. Cord prolapse, retroplacental haematoma and premature delivery were factors with a poor prognosis, accounting for 73.3% of these deaths.

The main complications were anaemia (8.8%), eclampsia (1.1%), haemorrhage (3.6%) and parietal suppuration (0.6%). These results were comparable to those reported by Cissé B [32], in Markala 15.1% and higher than that of Sanogo C.O [33], in Kita 3.6% with anaemia being the most common complication.

We recorded two (2) cases of maternal death, i.e. 0.6%, and the causes of maternal death were haemorrhage due to uterine rupture and eclampsia. Our case fatality rate is similar to that of Maiga I.B [21], in Commune V, but lower than those reported by Traoré A.T [12], in Kati in 2014; Maiga MI [31], in Point G, Sanogo Y.S [34], in Koutiala and Traore Y [28], in Nioro who reported 0.6%, 0.8%, 2.2% and 3.66% maternal deaths respectively. All these deaths were due to direct obstetrical causes, mainly haemorrhage (uterine rupture) and hypertension and its complications (eclampsia).

Peripartum haemorrhage and complications of hypertension are the main causes of maternal death in our study. Every effort must be made to strengthen the skills of healthcare personnel in the detection, prevention and management of these pathologies as part of the fight against maternal and perinatal mortality.

CONCLUSION

Improved transport conditions and good coordination of obstetric evacuations with the Kati reference health centre for even faster care could improve maternal and foetal prognosis.

Conflict of Interest: None

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