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Neonatal Morbidity and Mortality at Hospital Saint Camille de Ouagadougou (HOSCO): A Study from 2017 to 2020

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Abstract

Introduction: Neonatal pathology remains a real public health problem in developing countries. In Burkina Faso, this mortality has declined over the last ten years but remains below compared to the Sustainable Development Goals, which is 12 per 1000 living births at most by 2030. This study aims to identify specific causes of neonatal morbidity and mortality and will contribute to the implementation of preventive and curative measures aimed at reducing neonatal mortality at HOSCO. **Method:** This was a retrospective study using the records and database of newborns hospitalized from January 1[srt], 2017 to December 31[srt], 2020. Using logistic regression, the factors associated with mortality were determined. **Results:** During the study period, 3020 newborns were hospitalized. Most newborns (83.71%) were referred by a peripheral health facility. The average age at admission was 0.3 days ± 0.9 and the sex ratio was 1.2. Prematurity was the leading cause of hospitalization (61.13%) followed by neonatal infection (38.34%) and neonatal suffering (23.88%). The mortality rate was 40.6% with 82.71% cases of death in the early neonatal period. The main causes of death were low birth weight (47.39%), respiratory distress (18.76%), neonatal suffering (17.37%) and neonatal infection (13.87%). Home delivery, gestational age < 36 weeks, number of PNC < 4, concept of resuscitation, Apgar at the 5th minute < 7, birth weight < 2000 g and >4000 g, respiratory distress, hypothermia, neurological disorders were factors associated with deaths. **Conclusion:** Neonatal mortality is influenced by both maternal and fetal factors and many of them are pre-

ventable.

1. Introduction

Neonatal pathology remains a real public health problem in developing countries [1]. Sub-Saharan Africa experienced the highest neonatal mortality rate in 2019, recording 27 deaths per 1000 alive births, followed by Central and South Asia with 24 deaths per 1000 alive births [2]. In 2021, Burkina Faso's neonatal mortality rate was 25.3 deaths per 1000 alive births. Between the period from 1972 to 2021, Burkina Faso's neonatal mortality declined at a moderate rate, decreasing from 71.7 deaths per 1000 living births in 1972 to 25.3 deaths per 1000 living births in 2021 [3]. Nevertheless, this rate still falls below the Sustainable Development Goals (SDGs) which aim to achieve a neonatal mortality rate of 12 per 1000 alive births at most by 2030. The main causes of neonatal morbidity and mortality are mainly prematurity/hypotrophy (29%) perinatal asphyxia (27%) and neonatal infections (24%) [4]. Several actions are being undertaken at the national level to reduce this mortality for which, one of the most important of them is free healthcare for children aged from 0 to 5 years. Until then, this free service is not yet a reality at HOSCO, but since 2022, very promising steps have been taken with the supervisory ministry for its implementation. Neonatology will be a center of experimentation and this study is therefore intended to be an update of neonatal morbidity and mortality over a period of four years in the neonatology department of HOSCO. It will serve as a subsequent benchmark for evaluating the impact of free care on neonatal mortality and for the implementation of preventive and curative measures aimed at reducing neonatal mortality at HOSCO.

2. Materials and Methods

2.1. Type, Period, and Framework of Study

This was a cross-sectional study with descriptive and analytical aims. The retrospective data collection, encompassing from January 1, 2017, to December 31, 2020, was conducted in the Neonatology Department of HOSCO. The study was carried out from June 1 to July 6, 2021.

2.2. Study Population and Data Collection

The study population consisted of newborns aged 0 to 28 days hospitalized in the neonatology department during the study period. All newborns hospitalized in the department during the study period and whose records were usable were included.

Data from medical files and hospitalization registers were systematically collected using a structured data collection sheet Among the independent variables considered, sociodemographic data of mothers (including age, marital status, educational level, and income) and newborns (including age, sex, and maternity of origin) were distinguished.

Maternal history variables encompassed parity, number of prenatal consultations, tetanus vaccination status, anti-anemia and anti-malaria prophylaxis and maternal pathologies. Data related to childbirth included place, term, mode of delivery, type of presentation and maternal pathologies during childbirth. Clinical data of newborns encompassed temperature, weight, head circumference, height, the diagnosis of hospitalization, and the mode of discharge.

2.3. Statistical Analysis

The data were recorded and processed using Sphinx V.5 software and analyzed with SPSS 25 and Epi-info software version 7.2.0. Descriptive statistics were applied, presenting quantitative variables as averages and qualitative variables as numbers and percentages. In multivariate analysis, the Chi2 test was employed for comparing qualitative variables, while the Student t-test was used for quantitative variables. The multivariate regression test was conducted to identify factors associated with mortality. Statistical significance was set at $p < 0.05$.

2.4. Ethical Considerations

The study received authorization from the General Management of the hospital and the collected data were analyzed anonymously as confidentiality was required.

3. Results

3.1. General Characteristics of Newborns

During the four years, 3,020 newborns were hospitalized in the neonatology department of HOSCO. The annual count of hospitalized newborns varied over the years, with 689 in 2017, 822 in 2018, 786 in 2019, and 723 in 2020. The highest rates of hospitalizations were recorded in the months of September and October with 337 and 299 newborns, respectively (Figure 1).

Outborn newborns referred to HOSCO accounted for 83.71% (2528/3020) of admissions, while inborn cases constituted 16.29% (492/3020) of admissions. The mean age at admission was 0.3 days ± 0.9, ranging from 0 to 20 days. Newborns were admitted within the first 24 hours of life in 83.34% (2517/3020) of cases, as indicated in Table 1.

Delivery occurred in a maternity ward in 2982 cases (98.74%), while 38 cases (1.3%) involved home births. Of the deliveries in the maternity ward, the mode of delivery was specified for 2283 newborns. This breakdown included 1882 cases of vaginal delivery (82.43%) and 402 cases of cesarean section (17.61%). Among the vaginal deliveries, 1741 (92.51%) were eutocic, and 141 (7.49%) were

obstructed, with 33 cases involving instrumental extraction (25 cases of vacuum extraction and 8 cases of forceps). The mean gestational age of the newborns was 35.2 ± 3.9 amenorrhea weeks ranging from 25 to 42 amenorrhea weeks (Table 2).

The average weight of newborns at birth was 1908.8 g ± 896.5 g ranging from 530 g to 5270 g. Low birth weight was found in 71.77% of cases as shown in Table 3. Male sex was observed in 1639 newborns (54.27%), while female sex was noted in 1381 newborns (45.73%), resulting in a sex ratio of 1.2.
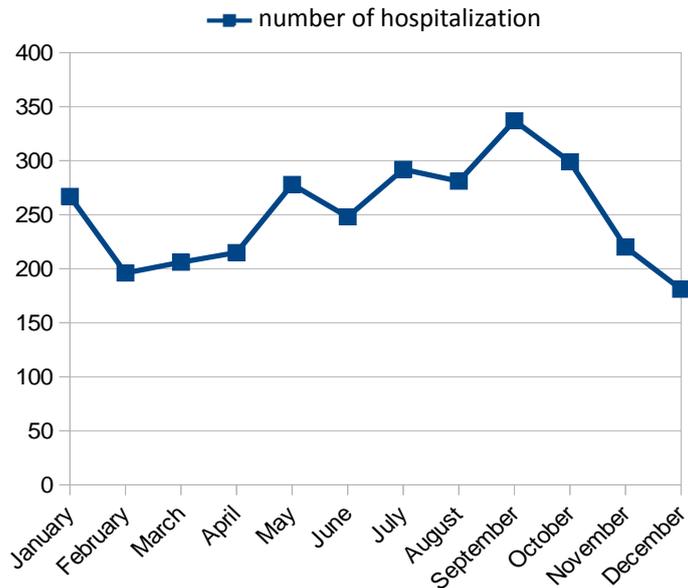
Figure 1. Number of hospitalizations according to the months.

Table 1. Distribution of newborns according to age at admission.

Age	N	Percentage (%)
<24 hours	2517	83.34
[1 - 4 days]	480	15.90
≥4 days	23	0.76
Total	3020	100.0

Table 2. Distribution of newborns according to gestational age in amenorrhea weeks (n = 2989).

Gestational age (amenorrhea weeks)	N	Percentage (%)
[25 - 28]	44	1.47
[28 - 32]	620	20.74
]32 - 37]	1217	40.72
[37 - 42]	1108	37.07
Total	2989	100

Table 3. Distribution of newborns according to birth weight (n = 2964).

Birth weight (grammes)	N	Percentage (%)
[500 - 1000]	303	10.22
[1000 - 1500]	1064	35.90
[1500 - 2000]	533	17.98
[2000 - 2500]	227	7.67
[2500 - 4000]	782	26.38
]4000 - 4500]	35	1.18
[4500 - 5000]	17	0.57
[5000 - 5500]	3	0.10
Total	2964	100.0

3.2. Characteristics of the Mothers

The mean age of the mothers was 26.9 years ± 6.2, ranging from 13 to 48 years. The age group of 20 to 29 years old comprised 1511 out of 2903 (52.05%) mothers. Professional activity was specified for 438 mothers. Among them, housewives accounted for 42% (184/438), civil servants represented 21.92% (96/438), pupils and students constituted 18.04% (79/438), and traders comprised the remaining 18.04% (79/438).

3.3. Prenatal and Perinatal History

The average Prenatal Care (PNC) was 3 consultations ± 1.3, ranging from 0 to 7 consultations, and 35.31% of mothers completed at least 4 PNC (Figure 2).

During these PNC visits, 96.5% of mothers received anti-malaria prophylaxis and iron-folic acid supplementation, while 96.6% received at least one dose of tetanus vaccine. Cases of malaria and urinary infections constituted 35.56% (16/45) and 22.23% (10/45), respectively, of all pathological cases diagnosed during pregnancy. Premature rupture of membranes occurred in 141 cases (4.67%).

The appearance of amniotic fluid was specified in 1596 mothers, with the following distribution: clear in 717 cases (44.92%), meconium in 576 cases (36.09%), hematic in 199 cases (12.47%), and malodorous or fetid in 104 cases (6.52%). Newborns requiring resuscitation at birth numbered 745 out of 2556 (29.15%). The average resuscitation time was 8.3 minutes ± 7.6, ranging from 1 minute to 90 minutes. The Apgar score at the 5th minute was specified in 2392 newborns, with scores between 0 and 3 in 1% of cases (indicative of apparent death), between 4 and 6 in 31% of cases (indicative of neonatal distress), and equal to or greater than 7 in 68% of cases.

3.4. Neonatal Morbidity

The most frequent reason for referral was prematurity with 1812 cases (60.0%), followed by respiratory distress with 833 cases (27.58%), 399 cases (13.21%) for resuscitation and 384 (12.72%) for hypotrophy.
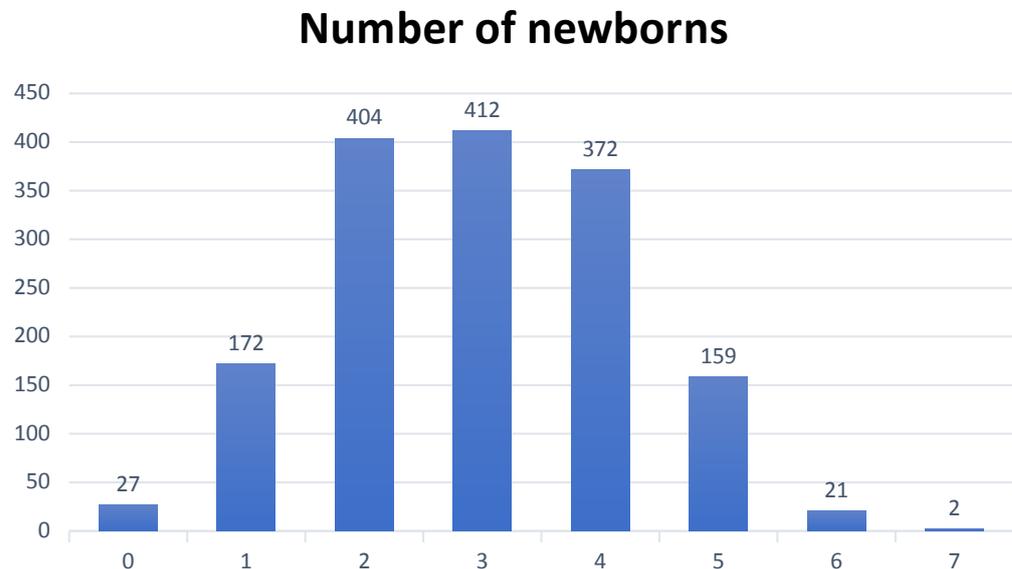
Number of newborns

Figure 2. Distribution of newborns according to number of Prenatal Care (n = 1569).

The mean temperature in our study was 35.7°C ± 1.4°C, ranging from 32°C to 41°C. Jaundice was identified in 2.7% of newborns. Respiratory distress was observed in 1956 newborns, with the Silverman score ranging between 1 and 10 and a mean of 4.1 ± 1.8. This score was between 1 and 2 in 24.6% of cases (indicating minimal respiratory distress), between 3 and 5 in 50.3% of cases (indicating moderate respiratory distress), and between 6 and 10 (indicating severe respiratory distress) in 25.1% of cases. Archaic reflexes were weak in 1282 (44.7%) newborns and absent in 382 (12.7%) newborns. Tone disorders (hypotonia) were found in 1523 (50.9%) newborns.

A malformation was noted in 97 newborns, including 36 cases of clubfoot, 22 cases of polydactyly, 15 cases of sexual ambiguity, 6 cases of cleft lip and palate, 6 cases of macrocrania, 4 cases of spina bifida, 2 cases of anal imperforation, 1 case of choanal atresia, and 5 cases of facial dysmorphism.

Prematurity emerged as the primary cause of hospitalization, accounting for 1846 cases or 61.13% of hospitalizations. Following closely, neonatal infection constituted 1158 cases or 38.34% of hospitalizations, and neonatal distress accounted for 993 cases or 32.88% (Table 4).

The hospitalization outcomes were characterized by 1245 cases (41.23%) of recovery, 483 newborns (15.99%) transferred to kangaroo mother care (SMK), 42 cases (1.39%) transferred to a university hospital center, 24 cases (0.79%) discharged against medical advice, and 1226 cases (40.60%) resulting in death. The mean length of hospital stay was 9.8 days ± 10.1, ranging from 0 to 121 days.

3.5. Overall Mortality

We observed 1226 cases of death, constituting a mortality rate of 40.6% during our study period.

Deaths during the early neonatal period totaled 1014 (82.71%), with 446 deaths (42.64%) occurring within the first 24 hours of life. Among the deceased newborns, 655 (53.43%) were male, and most deaths, 960 (78.3%), occurred during the period between 6 p.m. and 7 a.m.

The primary causes of death were as follows: low birth weight in 581 cases (47.39%), respiratory distress in 230 cases (18.76%), neonatal suffering in 213 cases (17.37%), and neonatal infection in 170 cases or 13.87% (see Table 5).

In multivariate analysis, a statistically significant association between death and the following factors was observed: Home birth; Gestational age less than 36 weeks; Number of PNC < 4; Parents residence located in a rural area; Upper birth; Maternal age between 30 and 39 years; Concept of resuscitation at birth; Apgar < 7 at the 5th minute; Birth weight < 2000 g and >4000 g; Moderate to severe respiratory distress; Hypothermia; Absent or weak archaic reflexes upon entry; alteration of the state of consciousness (Table 6).

Table 4. Distribution of newborns based on the diagnosed conditions.

Diagnosis	N	Percentage (%)
Prematurity	1846	61.13
Neonatal infection	1158	38.34
Neonatal suffering	993	32.88
Hypotrophy	989	32.75
Hyaline membrane disease	337	11.16
Hemorrhagic disease of the newborn	48	1.59
Congenital heart disease	42	1.39
Transient respiratory distress	31	1.03
Macrosomia	22	0.73
Bowel obstruction	19	0.63
Obstetric trauma	08	0.26
Polymalformative syndromes	04	0.13

NB: A newborn could have several diagnoses.

Table 5. Mortality rates from different causes.

Causes of death	N	Percentage (%)
Low Birth Weight	581	47.39
Acute respiratory distress	230	18.76
Neonatal Suffering	213	17.37
Neonatal infection	170	13.87
Hemorrhagic Disease of the Newborn	79	6.44
Necrotizing enterocolitis of the newborn	19	1.55

Table 6. Factors associated with neonatal mortality in multivariate analysis.

Factors	Deaths	Living	OR	[IC 95%]	P-value
Place of delivery					
UHC	246	364	1		
Home	25	13	2.85	[1.43 - 5.67]	**0.003**
SPHC	186	225	1.22	[0.95 - 1.58]	0.12
MC	231	424	1.24	[1.01 - 1.56]	0.06
MCA	202	238	1.26	[0.98 - 1.61]	0.07
HOSCO	171	305	1.20	[1.06 - 1.54]	0.14
Gestational age (AW)					
≥37	234	874	1		
[28 - 36]	896	752	4.45	[3.74 - 5.30]	**<0.0001**
[25 - 28]	40	4	37.35	[13.23 - 105.45]	**<0.0001**
PNC					
≥4	161	393	1		
<4	481	534	2.20	[1.76 - 2.74]	**<0.0001**
Residence place					
Urban	950	1506	1		
Rural	233	209	1.77	[1.44 - 2.17]	**<0.0001**
Delivery way					
Low	829	1053	1		
High	122	209	1.81	[1.43 - 2.28]	**<0.0001**
Mother's age (Years)					
≤20	178	202	1		
]20 - 30[	626	885	1.25	[1.01 - 1.56]	0.06
[30 - 40[	346	593	1.51	[1.19 - 1.92]	**0.001**
≥40	26	47	1.59	[1.06 - 2.68]	0.08
Resuscitation					
No	780	1031	1		
Yes	272	473	1.32	[1.10 - 1.57]	**0.002**
APGAR at the 5th mn					
7 - 10	736	1319	1		
4 - 6	163	151	1.94	[1.52 - 2.46]	**<0.0001**
0 - 3	17	6	5.08	[1.99 - 12.94]	**0.001**
Birth Weight (g)					
[500 - 1000]	277	26	41.19	[26.65 - 63.67]	**<0.0001**
[1000 - 1500]	561	503	4.31	[3.51 - 5.30]	**<0.0001**
[1500 - 2000]	144	389	1.43	[1.11 - 1.85]	**0.006**
[2000 - 2500]	54	173	1.21	[0.85 - 1.71]	0.29
[2500 - 4000]	167	615	1		
]4000 - 5500]	50	21	22.11	[18.46 - 33.33]	**<0.0001**

Continued

	breath distress				
Absente/light	476	926	1		
Moderate to Severe	707	768	1.79	[1.54 - 2.08]	**0.004**
	Body Température				
Normal/Hyperthermia	249	549	1		
Hypothermia	947	1183	1.69	[1.30 - 2.19]	**< 0.0001**
	Archaic reflexes				
Présent	323	1023	1		
Weak	606	676	2.84	[2.40 - 3.35]	**< 0.0001**
Absent	296	86	10.90	[8.32 - 14.29]	**< 0.0001**
	Altered Consciousness				
NO	389	1126	1		
Yes	834	654	3.69	[3.61 - 4.31]	**< 0.0001**

UHC: University Hospital Center; **SPHS**: Center for Health and Social Promotion; **MC**: Medical Center; **MCA**: Medical Center with Surgical Antenna; **HOSCO**: Hospital Saint Camille de Ouagadougou; **PNC**: Prenatal Care; **AW**: amenorrhea weeks.

4. Discussion

The neonatology department of HOSCO has long been a reference center in Burkina Faso. This explains why most children used to be hospitalized there usually come from maternities other than that of HOSCO. With the strengthening of its reception capacity and its technical platform by the inauguration of its new premises in 2017, its workforce experienced a peak in 2018 (822) and 2019 (786) before experiencing a slight decline from 2020 (723) due to the opening of other neonatology services in the city of Ouagadougou, notably the one of Charles de Gaulle Pediatric University Hospital Center.

Neonatal morbidity in our study was predominantly characterized by prematurity, numbered up to 1846 cases or 61.13% of hospitalizations, followed by neonatal infection with 1158 cases or 38.34%, and neonatal suffering and hypotrophy giving respectively 32.88% and 32.75%. The spectrum of newborn pathologies appears to remain the same across Sub-Saharan Africa, where only their frequency order varies accordingly to studies. For instance, Padonou *et al.* [5] in Porto-Novo, Benin (2017), identified low birth weight (27.6%), perinatal asphyxia (22.6%), and neonatal infection (16.9%) as the predominant conditions. Ratovoarisoa *et al.* [6] in Mahajanga, Madagascar (2019), highlighted neonatal infection (25.68%), hypotrophy (21.37%), and prematurity (20.92%) as primary diagnoses. Sylla *et al.* [7] in Bamako, Mali (2009), reported neonatal infection (33%), prematurity (29.9%), and neonatal asphyxia (24.6%) as the three main diagnostics. In our context, factors such as insufficient monitoring of pregnancies, unhygienic childbirth conditions, and challenges in newborn resuscitation due to inadequate facilities and qualified personnel in peripheral health struc-

tures contribute significantly to the prevailing causes of neonatal morbidity.

The mortality rate during the study period was 40.6%. While most studies reported lower fatality rates, such as Padonou *et al.* [5] in Porto-Novo, Benin in 2017 (31.1%); Yenan *et al.* [8] in Bouaké, Ivory Coast in 2014 (19.97%); Kouéta *et al.* [9] in Ouagadougou, Burkina Faso in 2007 (15.3%); and Koffi *et al.* [10] in Kpele-Tsiko, Togo in 2011 (23.3%), our findings diverged. The primary causes of death were low birth weight (prematurity/hypotrophy) in 581 cases (47.39%), respiratory distress in 230 cases (18.76%), neonatal suffering in 213 cases (17.37%), and neonatal infection in 170 cases (13.87%).

Across all the completed studies, we observed similar pathologies contributing to neonatal deaths, but in varying proportions [5] [8] [11] [12]. Factors influencing the high mortality rate in our series included prematurity and low birth weight, anoxo-ischemic encephalopathy, hypothermia, maternal factors like age between 30 and 40 years, insufficient prenatal care follow-up, and deliveries at home or in rural areas. These factors were also highlighted by other authors, including Zoungrana/Yameogo *et al.* [13], Rafamatanantsoa *et al.* [14], and Padonou *et al.* [5].

The absence of medical transport and a coordinated structure for newborn transfers, especially for premature infants, posed challenges to their prompt and effective care. Inadequate preparation for transfer, reliance on personal transportation, and prolonged travel times to health centers across the city resulted in hypothermia, hypoglycemia, and exacerbated cerebral hypoxemia, contributing significantly to neonatal mortality. Kouéta *et al.* [9] in Burkina Faso in 2011 noted that delayed access to health services (77%) tripled the risk of neonatal death.

Most deaths occurred during the early neonatal period, estimated up to 82.7%, with 36.4% occurring within the first 24 hours of life. Similarly, Zoungrana/Yameogo *et al.* [13] in 2021 in Ouagadougou, Burkina Faso, reported that 88.1% of deaths occurred during the early neonatal period, including 39.68% within the first 24 hours of life. Barro *et al.* [15] in 2019 in Bobo Dioulasso, Burkina Faso, found that 96% of deaths occurred within the first 7 days of life. According to Lawn *et al.* [16], neonatal mortality follows the "two-thirds rule": two-thirds of newborn deaths occur during the first month, with more than two-thirds of these deaths occurring within the first week, and two-thirds of those occurring during the first 24 hours after birth.

Despite being equipped with adequate medical equipment compared to other health structures of the same level, concerns arise about the rigorous monitoring of hospitalized newborns, especially during care (78.3% of deaths). Sylla *et al.* [7] in Bamako, Mali, in 2009 also found that deaths were more frequent during on-call hours (74.5%), possibly due to the reduced number of the on-call team and the absence of the pediatrician on site during on-call hours. Most dead newborns were male, constituting 53.4%. This excess male mortality, a recurring observation in various studies, is often attributed to supposed male fragility [6] [10].

The retrospective nature of our study entails certain limitations that warrant acknowledgment, notably the incompleteness of specific records regarding information about the mother and the progression of pregnancy.

5. Conclusion

The neonatology department of HOSCO, one of the biggest hospitals of the country, plays a critical role in managing a significant number of newborns presenting vital distress. Prematurity, infections, and neonatal distress, as highlighted in the literature, persist as the primary causes of neonatal morbidity and mortality. The high mortality rate underscores the inadequacy of human and material resources. Neonatal mortality is influenced by a combination of maternal and fetal factors, and our study emphasizes that many of these factors are preventable. Addressing this issue requires a comprehensive approach, including the education of women at childbearing age, continuous training for qualified health care staff, and mobilization of human and financial resources to enhance technical capabilities. Above all, establishing a robust health system that ensures continuity of care throughout pregnancy, qualified assistance during birth, and postnatal support is crucial to improving neonatal outcomes.

Conflicts of Interest

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

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Annexe

HOPITAL SAINT CAMILLLE DE OUAGADOUGOU PEDIATRIC WARD (HOSCO) NEONATOLOGY UNIT

Data collection sheet

Sheet / / / /

1) General data

ID number: / /; /; / /;/; e of birth /dd/mm/YYYY

2) Maternal data

Age: / /; Profession: / /; Gestation: / /; Parity: / /; Place of residence: City / /, Village / /

History:

+Medical: HBP / /; Diabetes / /; HIV / /; Sickle cell disease / /; Others / / Specify …………..

+Surgical: / / specify ………….

3) Father data

Age: / / Profession: / / Concept of consanguinity: / /

4) Pregnancy data

Gestational age: Weeks / /; Months / /

PNC: YES / / NO / / Number/ /

Intermittent preventive treatment: YES / / NO / /

Iron folic acid supplementation: YES / / NO / /

Tetanus vaccine: YES / / NO / /

Blood group/Rhesus:

HIV serologies: / /; Toxoplasmosis / /; Rubella / /; VDRL/TPHA / /; Cytomegalovirus / / herpes / /, hepatitis B / /

Hemoglobin electrophoresis / /

Ultrasound: YES / /; NO / /; Number / / Specify if anomaly:

Pathologies during pregnancy: YES / / NO / / Specify the nature …………. Quarter:

5) Childbirth data

Term of pregnancy: Preterm / /; Term / /; Postterm / /

Place of childbirth: Maternity / /; Home / / Specify:

Duratio of labor: ………………..

Premature rupture of membranes: YES / /; NO / / Duration: ………………

Appearance of amniotic fluid: Clear / /; Meconial / /; Other / /, Specify ………

Presentation: ………………………………….

Concept of obstructed delivery: YES / / NO / /

Abnormalities of the cord or placenta: YES / / NO / / Specify if YES:….

Maternal hemorrhage: YES / /; NO / /

Mode of delivery:

Vaginal delivery / / specify instruments used Yes / / No / / Specify if YES

Caesarean section/ /, indication: ……………

Perinatal pathology: Yes / / No / / specify if Yes………

6) Condition of the newborn at birth

Sex: / / Apgar: / /. / /. / /

Resuscitation: YES / / NO / / If yes, specify the resuscitation time: ………min

Cyanosis: Yes/ / No/ /

Measurments: Weight: …g Size: …cm Cranial perimeter: ….cm chest circumferencePTcm

7) Hospitalization

Date of admission: / / /

Age of newborns in days at admission: ………

Reason for hospitalization: ………..

8) Clinical data at entry

Temperature: …… degree Celsius Cardiac frequency: ……Beats/min Respiratory rate

Color: Pink: …… Cyanosis: …… Jaundice: ….. Pale:………

Respiratory distress: YES / /; NO / / If yes SILVERMANN Score: …………

Cardiac examination: normal / / breath/ /

Neurological state: Consciousness: normal / / Obtunded / / Coma / /

Archaic reflexes: Present / /; Weak / /; Absent

Congenital malformation: YES / /; NO / / Others …………………………

Congenital trauma: Yes / / No / / Specify if yes

9) Paraclinical examinations

Complete blood count: Leucocytes: … /ml Specify the predominance: …; Red Blood cells: …/ml; Hemoglobin level: … g/dl; Hematocrit: … %; MCV: … FL; MCHC: …; PLT: ……/ml

Blood group/ Rhesus: …

Tick drop: Positive / /; Negative: / /

Glycemia: …..mmol/l

Serum electrolytes: Kaliemia: …mmol/l; Natremia: …mmol /l; Calcemia: ….

CRP: …mg/l; Blood culture: Positive / /; Negative / / If positive, specify the germ isolated ……….

Transaminases: ASAT: …UI/L; ALAT: …UI/L

Free billirubin: …µmol/l; Bilirubine totale: …µmol/l

Uroculture: Positive / /; Negative / / If positive, specify the germ isolated ……

Transfontanellar ultrasound: Yes / / No / / Specify if anomly

Echocardiography: Yes / / No / /

Abdominal ultrasound: Yes/ / No/ / Specify if anomly

10) Diagnosis retained

/………………………………………………………………………………….

11) Treatments administered

- Antibiotic therapy: Yes / / No / / If yes specify: Ampi / / genta/ / ceftriaxone / / cefotaxime/ / Metronidazole / /
- Vitamin K1: Yes / / No / /
- Solutes: Yes / / No / /
- Eye care: Yes / / No / /

- Umbilical care: Yes/ / No / /
- Oxygen therapy: Yes / / No / /
- Phototherapy: Yes / / No/ /
- Caffeine citrate: Yes / / No / /
- Incubator: Yes/ / No/ /
- Cpap: Yes/ / No / /
- Maternal kangourou care Yes/ / No/ /

12) Evolution

Emission of meconium within 72 hours: Yes/ / No/ /

Emission of first urine within 24 hours: Yes / / No / /

Complication: Respiratory distress / / hypothermia/ / hypoglycemia/ / Jaundice / / hemorrhage/ / bowel obstruction / / dehydration / / hypertonia / / coma / /

Drying/ / anemia / /, metabolic disorders / /

13) Output mode

Output weight:

Healing: / / transfer to kangourou care/ / Exit againt medical advice: / /; Referred/ /; Death: / / Specify the cause if death: ………………

Release date: / / / /; Length of stay: ……………