Archives of Pediatrics and Neonatology
ISSN: 2638-5155
Volume 2, Issue 2, 2019, PP: 70-79

Respiratory Distress Syndrom of the Newborn in the Neonatology Unit of the Bouaké University Hospital (Côte D'ivoire)

Akaffou AE[1]*, Yeboua YKR[2], Avi C[2], Aka-Tanoh KAH[2], Yao KC[2], Kone TM[2], Akanji IA[2], Adou LR[2], Sahi GJL[2], Karidioula JM[2], Sanogo SC[2], Coulibaly D[2], Plo KJ[2], Asse KV[2]

[1]*Paediatrics Department Mother and Child Hospital of Bingerville (Côte d'Ivoire).
[2]Medical Paediatrics Department of the Bouaké University Hospital (Côte d'Ivoire).
eakaf@yahoo.fr

***Corresponding Author:** Dr. AKAFFOU Adja Evelyne, Associate Senior Lecturer in Pediatrics, Côte d'Ivoire.*

Abstract

***Background:** Neonatal respiratory distress syndrome (RDS) is a frequent and poorly studied cause of morbidity and mortality in Bouaké (Côte d'Ivoire). The objective of the study was to describe the epidemiological, diagnostic, therapeutic and evolutionary aspects of this condition for the improvement of prognosis.*

***Methods:** This was a retrospective, descriptive and analytical study conducted in neonatology at the Bouaké University Hospital from January to December 2018. This included newborn admitted for RDS based on clinical arguments and with an exploitable medical record. The variables studied were socio-demographic, diagnostic, therapeutic and progressive. The data analysis was descriptive and analytical. The comparison of quantitative variables was made at the significance threshold p≤0,05.*

***Results:** 1920 newborns were admitted, 232 of whom were for DRs (146 boys and 86 girls), representing a prevalence of 12%. The age was less than 3 days in 87%. The newborn was full term (78%), premature (19%), post-term (3%). The four causes accounting for 97% of etiologies are infection (50%), inhalation of amniotic fluid (23%), hyaline membrane disease (15%) and delayed resorption of pulmonary fluid (9%). The evolution was favourable in 69%. Lethality was 22%. Factors associated with death were maternal age <20 years (p=0.009), SARNAT II and III score (p=0.02), infection (p=0.001) and amniotic fluid inhalation (p=0.02) and hyaline membrane disease (p=0.001).*

***Conclusion:** Neonatal RDS is common at Bouaké University Hospital. The main etiologies are infection, inhalation of amniotic fluid and hyaline membrane disease. Lethality remains high. Improving prognosis requires increased resources and collaboration between the gynaecologist/obstetrician and the paediatrician.*

Keywords: *Respiratory distress, newborn, etiology, prognosis, Côte d'Ivoire.*

Introduction

Respiratory distress syndrom (RDS) in the newborn is defined as a change in respiratory rate associated with one or more signs of respiratory control with or without cyanosis in the ambient air in children aged 0 to 28 days of life [1]. It is a common syndrome in the neonatal period with a prevalence ranging from 3.5% to 23.4% according to studies [2, 3]. It multiplies the risk of death by four [4, 5, 6, 7] and is a common clinical manifestation of the major causes of neonatal morbidity and mortality, including prematurity, perinatal asphyxia and infections [8]. Positive diagnosis of neonatal RDS is easy and based on the detection of clinical symptoms [1]. However, the etiologies are varied [9] and their identification requires a high-performance technical platform that is not always available in low- and middle-income countries, including Côte d'Ivoire. The management of RDS requires a good organization of perinatal care in the form of integrated networks, involving a minimal technical platform and skills in intensive care,

especially in respiratory assistance techniques which are not always available [10, 11, 12]. In Abidjan the RDS was the fourth disease or symptom in hospitalized newborn at Yopougon University hospital with a frequency ranging from 15,6% to 23,4% [13,14]. The study by Yenan and al. [15] on neonatal morbidity and mortality conducted in 2013 in the neonatal unit of the paediatric ward of Bouaké University Hospital reported that respiratory distress syndrom accounted for 6.67% of hospitalization reasons and 10.6% of deceased newborns had this syndrome [15]. It seemed appropriate to us to characterize the respiratory distress of the newborn at the Bouaké University Hospital for the improvement of the prognosis. The objective of the study was to describe the main epidemiological, clinical, therapeutic and evolutionary aspects.

Methods

This was a retrospective descriptive and analytical study conducted in the neonatology unit of the Bouaké University Hospital from January to December 2018. The neonatal unit is the only tertiary level unit located about 350 km from Abidjan, the economic capital in the South. This unit has a sanitary area that covers about 60% of the national territory. The unit has three cradles, eight incubators, three radiant tables, two phototherapy devices, a vacuum cleaner, four oxygen cylinders each equipped with a pressure gauge, three oxygen concentrators, a pulse oximeter and two nursing chairs. The medical and paramedical team of this unit includes a paediatrician assistant head of clinic, a hospital intern, four doctors enrolled in the Diploma of Special Studies in Paediatrics, two doctoral students, two medical students, fourteen midwives, five health assistants and two hospital workers. The reception and visit of the newborns were daily and provided by two doctors and two PhD students assisted in their task by two midwives, two nursing assistants and a hospital services officer. Duty and on-call duty were also provided by two physicians, two medical students, two midwives, a health care assistant and a hospital services officer. The study population consists of all newborns admitted to the neonatology unit during the study period. Included in the study were all admitted newborns with respiratory distress as the main reason for admission at any stage of severity with an exploitable medical record. Any newborn with respiratory distress that occurred during hospitalization or died on arrival without a medical record or an unusable medical record were not included in the study. The sampling was exhaustive and the sample consisted of all cases that met the inclusion criteria during the study period. At admission, newborns in respiratory distress were received urgently on a radiant table and given a complete clinical examination after rhinopharyngeal clearance, oxygen therapy (if SaO2 < 94%) and stabilization of major vital functions if necessary. The paraclinical assessment included, depending on the etiological orientation, a thoraco-abdominal radiograph, a blood count, C Reactive Protein, blood culture, blood glucose, blood calcium, blood group. Management was based on support for vital functions and treatment of the cause of respiratory distress. Treatment monitoring was clinical and paraclinical. All information about the child and his or her family, the care provided and the progress under treatment was recorded in a medical file. For data collection, we have developed a standardized, anonymous and structured survey form. It provided information on: (i) the socio-demographic characteristics of the newborn (sex, age, place of residence) and mother (age, level of education, occupation, medical history), (ii) diagnostic characteristics: reasons and signs of physical examination, paraclinical examinations performed and their results, causes of respiratory distress, (iii) therapeutic and progressive characteristics: symptomatic and etiological means, discharge modalities, duration of hospital stay, factors associated with death. Regarding ethical considerations, a prior investigation authorization had been obtained from the Scientific Medical Directorate of the University Hospital with amplification to the Head of the Paediatrics Department. The information collected was made anonymous by a coding system. The data were entered and analyzed using the Epi-Info 7 computer software. The quantitative variables were expressed as means with the standard deviation. Qualitative variables were expressed as proportions. The comparison of the qualitative variables was made with the Chi 2 or Chi 2 test with Yates correction or the Fischer test when the conditions for applying Chi 2 were not met. The significance threshold is set for a value $p<0.05$.

Results

Epidemiological Aspects

During the study period, 1920 newborns were hospitalized, including 232 for respiratory distress,

representing a hospital prevalence of 12%. The newborn was male in 62% and female in 38%, for a sex ratio of 1.61. The newborn's age at admission was 0-3 days in 87% with an average age of 2 +/- 5.2 days [extremes 0 and 28 days]. When the mother's age was specified in the medical record, 57% of the mothers were 20-35 years old. The mother had an average age of 27 years +/- 7.6[extreme 14 and 50 years], out of school in 67% and housewife in 53% of cases. The main socio-demographic characteristics of the newborn and mother are shown in Table I. The newborn's pre-, peri- and postnatal history is shown in Table II.

Table I. *Main socio-demographic characteristics of the mother-child relationship*

Socio-demographic characteristics	Number	Percentage
Gender (n=260)		
Male	146	62
Female	86	38
Age		
≤ 3 jours	201	87
>3jours	59	23
Place of residence (n=125)		
Bouaké	102	82
Out of Bouaké	23	18
Mother's age (n=185)		
< 20 ans	46	25
20 – 35 ans	106	57
36 – 51ans	33	18
Mother's level education (n=12)		
Not in school	8	67
Primary school	1	8
Secondary school	3	25
Mother's occupation (n=146)		
Housewife	78	53
Trader	30	21
Student	20	14
Seamstress & hairdesser	12	8
Civil servant	5	3

Table II. *Pre, per and postnatal history*

Characteristics	Number	Percentage
Number of prenatal visits (n=197)		
< 4	130	66
≥ 4	67	34
Pregnancy disorders (n=28)		
Malaria	16	57
High blood pressure	4	14
Pelvialgia	3	11
Vulvovaginitis	2	7
Diabetes	1	4
Hydramnios	1	4
Retroplacental hematoma	1	4
Positive serology		

Rétroviral (n=85)	9	11
Rubella (n=21)	7	33
Toxoplasmosis (n=29)	12	41
Syphilis (n=28)	3	11
Blood count results (n=38)		
Anemia	23	61
Normale	15	39
Electrophoresis hemoglobin results (n=33)		
Hemoglobin A1A2	32	97
Hemoglobin AS	1	3
Place of delivery (n=181)		4,4
Peripheral maternity	104	57
Maternity at hospital Bouaké	72	40
Residence	5	3
Gestational age (n=232)		
< 37 SA	44	19
37 – 41	182	78
≥ 42 SA	6	3
APGAR (n=204)		
1 - 3	8	4
4 - 7	80	39
8 - 10	116	57
Weight (=195)		
< 2500 g	59	29
2500- 3999 g	129	67
≥ 4000 g	7	4
Newborn resuscitation (n=232)		
Yes	75	32
No	157	68
Infectious score of Houenou (n=93)		
0 (no infection)	25	27
I (possible infection)	49	53
II (probable infection)	19	20

Diagnostic Aspects

The main reasons for consulting the newborn were respiratory difficulty (92,4%) and fever (4.8%) (Table III). The physical signs were tachypnea, apnea and bronchial rales in 48%, 17% and 11% respectively (Table IV). Respiratory distress was mild according to Silverman's score in 55% of cases and moderate to severe in 45%. The neurological condition of the newborn in respiratory distress was normal in 43% of cases. The causes of neonatal respiratory distress identified are shown in Table V.

Table III. *Main reasons for consultation*

Reasons for consultation	Number	Percentage
Respiratory difficulty	232	92.4
Fever	12	4.8
Pale	2	0.8
Bleeding	2	0.8
Vomiting	1	0.4
Trembling	1	0.4
Apnea	1	0.4
Total	251	100

Table IV. *Main physical signs*

Signs of examinations	Number	Percentage
Tachypnea	124	48
Apnea	44	17
Bronchial rails	28	11
Cyanosis	14	5
Convulsions	12	5
Bradycardia	8	3
Breathing break	8	3
Crackling rails	7	3
Coma	6	2
Pale	5	2
Tachycardia	4	2
Total	**260**	**100**

Table V. *Main etiologies of neonatal respiratory distress*

Etiologies	Number	Percentage
Neonatal infections	93	50
Inhalation of amniotic fluid	42	22.5
Hyaline membranes disease	28	15
Delays in the resorption of pulmonary fluid	16	9
Metabolic disorders	2	1
Hemorrhagic disease of the newborn (anemia)	1	0.5
Congenital heart disease	1	0.5
Tracheomalacia	1	0.5
Omphalocele	1	0.5
Diaphragmatic hernia	1	0.5
Total	**186**	**100**

Therapeutic and Evolutionary Aspects

Treatment included infusion of electrolyte-enriched 5% glucose serum in 94%, oxygen therapy in 74%, antibiotic therapy in 63% and bolus glucose serum in 10% in 56% (Table VI). The duration of the stay was less than or equal to 7 days in 91% of cases. The newborn's evolution was marked by healing in 69% of cases, discharge against medical advice in 9% of cases and death in 22%. The death occurred during the early neonatal period in 92% of cases. Significant factors associated with death were maternal age less than 20 years (p=0.009), SARNAT II and III score (p=0.02), neonatal infection (p=0.001), amniotic fluid inhalation (p=0.02) and hyaline membrane disease (p=0.001) (Table VII).

Table VI. *Main treatments undertaken*

Traitements	Effectifs n/N	Pourcentage
Serum glucose infusion 10% and 5%	218/232	94
Oxygen	172/232	74
Antibiotics	145/232	63
Bolus serum glucose 10%	131/232	56
Resuscitation measures	84/232	36
Caffeine citrate	29/232	13
Blood transfusion	19/232	8
Phototherapy	6/232	3

Table VII. *Varied uni analysis of risk factors for death by respiratory distress syndrom*

Variables	Evolution		Khi 2	P
	Healing n	Death n		
Gender				
Male	112	34	0.005	0.93
Female	68	18		
Mother's age				
< 20 ans	28	16	8.85	0.002*
≥ 20 ans	119	22		
Severity of respiratory distress syndrom				
Score Silverman 1 – 3	84	20	4.83	0.08
Score Silverman 4 - 5	48	9		
Score de Silverman ≥ 6	18	10		
Neurological impact of the RD				
Score SARNAT 0 et I	96	18	4.93	0.02*
Score SARNAT II et III	84	34		
Neonatal infections				
Yes	86	7	9.90	0.001*
No	69	24		
Inhalation of amniotic fluid				
Yes	29	13	5.37	0.02*
No	124	20		
hyaline membranes disease				
Yes	16	12	10.68	0.001*
No	135	23		
Resuscitation				
Yes	62	13	1.025	0.31
No	119	38		

** Significant P at the threshold <5%*

Discussion

The objective of the study is to describe the main epidemiological, diagnostic, therapeutic and progressive aspects of neonatal respiratory distress for improving prognosis. The work results in a hospital prevalence of 12% and a male predominance (62%). The mother is mainly young, illiterate, housewife with insufficient prenatal consultation in almost two thirds of cases. Respiratory distress, according to Silverman's score, is mild in 55% and intense to severe in 45% of cases. The four causes accounting for 97% of etiologies are infection (50%), inhalation of amniotic fluid (23%), hyaline membrane disease (15%) and delayed resorption of pulmonary fluid (9%). The evolution is favourable in 69% and lethality in 22%. Factors associated with death were maternal age <20 years (p=0.009), SARNAT II and III score (p=0.02), infection (p=0.001) and amniotic fluid inhalation (p=0.02) and hyaline membrane disease (p=0.001). Due to the retrospective and monocentric nature of the study, not all variables could be included in the files. This is a bias that may underestimate or overestimate the results of the study. Despite the methodological limitation, the study provides a basis for relevant information on respiratory distress and could be used for further in-depth work. The results of this work give rise to the following points of discussion in terms of epidemiological, diagnostic, therapeutic and evolutionary aspects.

At the Epidemiological Level

The study reveals a prevalence of respiratory distress of 12%. Diakité [14] in Mali, Chalecon and al. [17] in France and Mampangula [18] in the Democratic Republic of Congo, reported a prevalence of respiratory distress of 27.8%, 47.5% and 58.4% respectively. Despite this high variability, probably due to methodological differences, all these studies show that neonatal respiratory distress is frequent and a worrying health problem. The newborn in

respiratory distress is male in 62% of cases. There is also a report in the literature of male predominance [12, 18, 19, 20]. This male predominance could be explained by the presence of cortisol levels, which play an important role in pulmonary maturation, which are lower in the amniotic fluid of the male newborn [21]. The mother of the newborn in respiratory distress is in the majority of cases young, with an average age of 27 years. This maternal characteristic has also been reported in the literature by Faye and al. [11] in Senegal in 2016, Sangaré [22] in Mali in 2017. Mampangula [18] in the Democratic Republic of Congo in 2013, Dick-Amon-Tanoh and al. [23] in Côte d'Ivoire also reported a young mother with an average age of 26.9 years. Pregnancies in a young mother increase the risks for both mother and child. According to WHO, in low- and middle-income countries, there are 50% more stillbirths and neonatal deaths among children born to mothers under 20 years of age. The younger the mother, the greater the risk of the child having a low birth weight, being premature, experiencing acute fetal suffering and respiratory distress [24]. Mothers are illiterate in 67% of cases and housewives in 53% of cases. The same observation was made by Diakité [16] and Siakam [25] in Mali and Maunga [26] in Senegal, but in different proportions. Low enrolment rates are a limiting factor in the demand for medical and antenatal care services, which contributes to worsening the early neonatal prognosis. Poor pregnancy follow-up increases the risk of premature delivery, neonatal suffering, respiratory distress and death [26, 27]. Ekounzola [28] in Brazzaville reported that for financial and proximity reasons, disadvantaged or poor women preferentially give birth in peripheral hospitals at lower cost. It appears from this work that only 34% of mothers carry out more than four prenatal consultations. This rate is close to the 38.4% reported in 2015 by the Ministry of Health and Public Hygiene of Côte d'Ivoire. However, it remains below the 70% target set by the National Health Development Plan 2016-2020 in accordance with WHO recommendations [29,30]. In the study, 12% of pregnant women presented a pathology during pregnancy. These were mainly malaria (57.5%), high blood pressure (14%) and pelvic pain (11%). In the study of Diakaridia [31] in Mali, the pathologies reported were high blood pressure associated with pregnancy toxemia (38%), retroplacental hematoma (30%), anemia in pregnancy (22%), and intrauterine growth restriction. When pregnancy follow-up is insufficient, the fetus may experience birth distress. In the study, 57% of newborns had cerebral pain at birth in addition to respiratory distress. This result is comparable to that of Dick-Amon Tanoh and al. [11, 23] who reported a rate of 52.2% of newborns in respiratory distress in the same country with an Apgar score below 7. This high rate of brain suffering could be explained by difficulties during childbirth. Indeed, parturient women are evacuated late after poor management of the pathology associated with pregnancy and/or work in peripheral maternity wards [32]. The high frequency of intrauterine growth retardation cases, 29%, among neonates in respiratory distress in the study has already been reported by other authors [2, 18, 19,33] in the literature. The hypotrophic fetus's susceptibility to hypoxia during labour probably explains this high rate of hypotrophy among newborns suffering from respiratory distress.

At the Diagnostic Level

In the study, respiratory distress was mild in 55%, moderate in 30% and severe in 15%. In the same country, Dick-Amon and al. [23] reported 31.7% cases of mild respiratory distress, 41.5% moderate and 26.8% severe respiratory distress in Abidjan. Faye and al. [11] in Senegal and Mampangula [18] in the Democratic Republic of Congo reported 47.6% and 71% of cases of severe respiratory distress respectively. Signs associated with respiratory distress in the study are tachypnea (48%), apnea (17%) and bronchial rales (11%). For Faye and al. [11], the main signs associated with respiratory distress were hypotonia (41.1%), pulmonary condensation syndrome (31.3%) and seizures (20.1%). In our series the etiologies of respiratory distress are dominated by neonatal infections (50%), inhalation of amniotic fluid (23%), hyaline membrane disease (15%) and delayed resorption of alveolar fluid (9%). In the same country, Dick-Amon and al. [23] reported in 2011 that maternal-fetal bacterial infection and perinatal asphyxia were the main causes of respiratory distress in the newborn. In the study by Faye et al. [11] in Senegal in 2016, the reported etiologies were neonatal infection (55.1%), inhalation of amniotic fluid (14%) and perinatal asphyxia (24.8%). Other authors such as Mampangula [18] in the Democratic Republic of Congo, Boussettine [34] in Algeria, Kisito [35] in Burkina Faso have also reported these main medical

etiologies but in different proportions. In the study, no surgical causes were reported. In Dick-Amon and al. [23] study, esophageal atresia and congenital heart disease were the reported surgical causes.

On the Therapeutic and Evolutionary Level

Serum glucose infusion 10% and 5%, oxygen, antibiotic and serum glucose bolus 10% are the main treatments administered respectively in 94%, 74%, 63% and 56%. According to Mampangula [18] in the Democratic Republic of Congo, 100% of newborns received IV fluids for treatment and received oxygen therapy, 80% aspiration and 40% warming. In addition, of the 15% of newborns who suffered from respiratory distress due to hyaline membrane disease, only 13% received caffeine citrate as treatment. Indeed, given the parents' modest socio-economic level, it is difficult for them to comply with all prescribed prescriptions. Also, there is sometimes a drug shortage in the university hospital pharmacy. We also note that antibiotic therapy is used in 63% of cases while the reported infection rate is 50% in our study, 63% This 13% surplus is related to the systematic use of antibiotics in response to the poor clinical condition of the child, the time it takes to receive the results of the requested paraclinical check-ups. The evolution of the newborn is marked by healing (69%), death (22%) and discharge against medical advice (9%). Factors significantly associated with lethality are maternal age less than 20 years (p=0.009), SARNAT II/III score (p=0.02), amniotic fluid inhalation (p=0.02) and hyaline membrane disease (p=0.001). This lethality was also high in other countries ranging from 19 to 52% [2, 11, 24, 36, 37]. Improving the prognosis of newborns in respiratory distress requires a comprehensive perinatal management approach, involving antenatal interventions (corticosteroids, antibiotic prophylaxis), improving the quality of neonatal transfer and raising the technical plateau in neonatal intensive care units [38]. Thus the introduction of new neonatal techniques in the United States had made it possible to reduce the lethality of distress from 26% to 4% in 20 years [39].

Conclusion

Respiratory distress is frequent in newborns at Bouaké University Hospital. It mainly concerns newborns of the male sex, young mothers, illiterate and housewives. The causes are numerous and dominated by infections, inhalation of amniotic fluid, hyaline membrane disease and delayed resorption of alveolar fluid. It is a serious syndrome with high lethality. Factors significantly associated with lethality are maternal age below 20 years, SARNAT II and III score, infection and prematurity. Hence the actions to be taken to improve prognosis as announced in the objective: better monitoring of pregnancies in pregnant women under 20 years of age, better labour and delivery surveillance to reduce SARNAT II and III anoxo-ischemic encephalopathy, reduction of risk factors for preterm delivery and neonatal infection.

Acknowledgements

The staff of the paediatrics department of the Bouaké University Hospital.

References

[1] Assé KV. Respiratory distress syndrom of the newborn baby In The Essential in Tropical Pediatrics. 2nd ed. Abidjan 2016: p 59-66

[2] Lasme E, Amon-Tanoh Dick F, Akaffou E; Ehua-Amangoua E, Koffi O.; Kangah Diekouadio F. Risk factors for neonatal respiratory distress in hospitals in Abidjan. Ann. Pediatr. 1997,44 (9) : 635-9

[3] Nagalo K, Dao F, Tall FH, Yé Diarra. Morbidity and mortality of newborns hospitalized over 10 years at Clinique El Fateh-Suka (Ouagadougou, Burkina Faso). Pan Afr Med J 2013; 14 : 153 DOI : 10.11604/pamj.2013.14.153.2022

[4] American Academy of Pediatrics and American Heart Association. Textbook of neonatal resuscitation. 6th ed. USA; 2011: p2

[5] Edwards MO, Kotecha SJ, Kotecha S. Respiratory distress of the term newborn infant. Paediatr Respir Rev 2013; 14(1):29-36; Swarnkar K, Swarnkar M. Neonatal respiratory distress in early neonatal period and its outcome. Int J Biomed Adv Res 2015;6(9):643-7

[6] Parkash A, Haider N, Khoso ZA, Shaikh AS. Frequency, causes and outcome of neonates with respiratory distress admitted to Neonatal Intensive Care Unit, National Institute of Child Health, Karachi. JPMA 2015; 65:771-5

[7] Swarnkar K, Swarnkar M. Neonatal respiratory distress in early neonatal period and its outcome. Int J Biomed Adv Res 2015;6(9):643-7

[8] WHO. Newborns: reduce mortality. Available on: URL. https://www.who.int/fr/news-room/fact-sheets/detail/newborns-reducing-mortality Accessed 24/07/2019

[9] Bourrillon A, Benoist G, Delacourt C. Campus of Paediatrics - Collège National des Pédiatres Universitaires (CNPU). Available on: URL http://campus.cerimes.fr/media/campus/deploiement/pediatrie/enseignement/nouveau_ne/site/html/4_8.html Accessed 26/07/2019

[10] Chabernaud JL. Management of a newborn baby in distress in the birth room and its transport. Journal of Paediatrics and Childcare 2004; 17: 101-11

[11] Faye PM, Ba ID, Diagne-Gueye NR, Dieng YJ, Gueye M, Ba A et al Respiratory distress of the term newborn in the neonatal department of the Albert Royer Children's Hospital in Dakar, Senegal. Black African Medicine 2016; 63(1): 35-43

[12] Tochie JN, Choukem S-P, Langmia RN; Barla E; Koki-Ndombo P. Neonatal respiratory distress in a reference neonatal unit in Cameroon: an analysis of prevalence, predictors, etiologies and outcomes. Pan Afr Med D 2016;24:152 doi: 10.11604 / pamj.2016.24.152.7066

[13] Akaffou AE, Karama-Tapé K, Kangah D, N'Guessan R, Dick-Amon Tanoh F. Neonatal morbidity and mortality in Yopougon University hospital by the ten first years. Med Afr Noire 2009;56(8-9):429-34

[14] Lasme E, Amon-Tanoh Dick F, Akaffou E, Ehua-Amangoua E, Koffi O, Kangah Diekouadio F. Risk factors for neonatal respiratory distress in hospitals in Abidjan. Ann. Pediatr. 1997,44 (9): 635-9

[15] Yenan JP, Plo KJ, Asse KV. Neonatal morbidity and mortality at the paediatric ward of the Bouaké University Hospital. RAMUR 2013; 18(2). Available on: URL https://saranf.net/Morbidite-et-mortalite-neonatales.html

[16] Diakité S. Contribution to the study of neonatal respiratory distress in the paediatric ward of the Gabriel Touré University Hospital (October 15, 2006 to January 15, 2007. Thesis Med 2009. Univ de Bamako. Available at URL: http://www.keneya.net/fmpos/theses/2009/med/pdf/09M155.pdf accessed 23/07/2019

[17] Chalacon M, Debillon T, Plantaz D, Ego A. Risk factors for respiratory distress in moderate premature infants (32 to 34 weeks of amenorrhoea). Thesis Med. 2012 Univ Joseph Fourrier

[18] Mampangula T. Clinical, etiological and therapeutic profile of neonatal respiratory distress. Democratic Republic of Congo. Thesis Med 2013 univ kongo. Available at URL: https://www.memoireonline.com/10/13/7457/Profil-clinique-etiologique-et-therapeutique-de-la-detresse-respiratoire-neonatale.html accessed 23/07/19

[19] Condò V, Cipriani S, Colnaghi M, Bellù R, Rinaldo, Zanini R and Neonatal respiratory distress syndrome : are risk factors the same in preterm and term infants? The Journal of Maternal-Fetal & Neonatal Medicine. Available at URL: https://www.tandfonline.com/doi/abs/10.1080/14767058.2016.1210597 accessed 26/07/19

[20] Zahari K. Respiratory distress in term newborns in the neonatal department of the Albert Royer National Children's Hospital of Dakar thesis 26 March2005.AvailableatURL:http://196.1.97.20/viewer.php?c=thm&d=thm%5f2016%5f0230 accessed 28/07/19

[21] Papageorgiou AN, Coile E, Farri-Kostopoulos E, Gelfand MM. Incidence of respiratory distress syndrome following antenatal betamethasone: role of sex, type of delivery, and prolonged rupture of membranes. Pediatrics 1981; 67(5):614-6

[22] Sangaré D. Immediately become premature babies in the paediatric ward of Sikasso Hospital in Mali. Thesis Med. 2017. Univ Bamako Available at URL: http:// www.keneya.net/ fmpos/ theses/1990/17M111.pdf consulted on 27/07/19

[23] Dick-Amon-Tanoh F, Lasme-Guillao BE, Cardenat M, Tanoh Kouakou O, Akaffou AE, Nguessan R. Epidemiological profile of respiratory distress in neonatology at the Yopougon University Hospital Centre in Abidjan. Rev Pneumol Trop 2011; 15 : 46-52

[24] Le Figaro. Prematurity: What are the causes and risk factors of prematurity? Available at URL: http:// sante.lefigaro.fr / sante / bebe / prematurite/quels-sont-causes-facteurs-risque-prematurite consulted the 26/07/19

[25] Siakam Y. Respiratory distress of the newborn and infant from 0 to 60 days of life in the paediatric intensive care unit of the HGT Thesis of Med 2003, University of Bamako.M33

[26] Maunga A. Diseases of hyaline membranes about 54 cases collected at the neonatology department of the Albert Royer Children's Hospital in Dakar DES thesis in paediatrics 2018 univ Cheikh Anta Diop in Dakar

[27] Mian DB, Koffi S, Oko R, Kouakou F, Nguessan KLP, Abauleth YR et al Early neonatal outcomes of pregnancies insufficiently monitored at the maternity unit of the Cocody-Abidjan University Hospital. RAMUR 2014; 19(2) Available at: URL https://saranf.net/issues-neonatales-precoces-des.html accessed on 26/07/2019

[28] Ekounzola JR, Buambo SF, Nkihouabonga. About 204 parturient women referred to the Brazzaville Hospital and University Centre. J SAGO, 2003; 4 : 1-5

[29] MSHP. National Health Development Plan 2016-2020. Available on: URL http://www.nationalplanningcycles.org/sites/default/files/planning_cycle_repository/cote_divoire/pnds_2016-2020.pdf

[30] Villar J. WHO Randomized Prenatal Care Trial for Prenatal Care, Implementation Guide for the New Model. Geneva: World Health Organization; 2002. p. 42

[31] Diakaridja D. Relationship between prenatal consultation, pregnancy outcome and childbirth: study of 1296 cases. Thesis Med 2009 Univ de Bamako. Available at URL: http://www.keneya.net/fmpos/theses/2009/med/pdf/09M518.pdf accessed 28/07/19

[32] Cissé CT, Yacoubou Y, Ndiaye O, Diop-Mbengue R, Moreau JC. Evolution of early neonatal mortality between 1994 and 2003 in Dakar. J Gynecol Obstet Biol Reprod 2006; 35 : 46-52

[33] Tochie JN, Choukem S-P, Langmia RN; Barla E; Koki-Ndombo P. Neonatal respiratory distress in a reference neonatal unit in Cameroon: an analysis of prevalence, predictors, etiologies and outcomes. Pan Afr Med D 2016; 24 : 152. doi: 10.11604 / pamj.2016.24.152.7066

[34] Compass S. Respiratory distress in the newborn these Med 2016/2017 univ Abu Bekr Belcaid Tlemcen]

[35] Kisito N. Mortality and morbidity of newborns hospitalized over 10 years at the El Fateh-Suka clinic (Ouagadougou) Pan African Medical Journal year 2013. Available at URL: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3683511 accessed on 28/07/19

[36] Mlay GS, Manji KP. Respiratory distress syndrome among neonates admitted at Muhimbili Medical Centre, Dar Es Salaam, Tanzania. J Too Pediatr 200 ; 46(5) : 303-7

[37] Kumar A, Bhat BV. Epidemiology of respiratory distress of newborns. Indian J Pediatr 1996; 63(1) : 93-8

[38] Patry C, Hien S, Demirakca S, Reinhard J, Majorek M, Brade J et al Adjunctive therapies for treatment of severe respiratory failure in newborns. Klin Padiatr 2015; 227(1) : 28-32

[39] Kamath BD, Macguin ER, Mclure EM, Goldenbag RL, Jobe HA. Neonatal mortality from respiratory distress syndrom: lesson for low-resource countries. Pediatrics 2011; 127(6) : 1939-44

Citation: **Akaffou AE, Yeboua YKR, Avi C, Aka-Tanoh KAH, Yao KC, et al.** *Epidemiological Profile of 260 Rural Home Births in Ahaly canton of Brobo (Côte D'ivoire). Archives of Pediatrics and Neonatology. 2019; 2(2): 70-79.*