NEWBORN'S RESPIRATORY DISTRESS: THE EXPERIENCE OF THE NEONATALOGY AND NEONATAL INTENSIVE CARE WARD OF THE UNIVERSITY HOSPITAL OF LIBREVILLE – GABON

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Abstract:-

Introduction: Few studies on respiratory distress in neonates (RDN) have been conducted in Gabon. In order to improve the management of this condition, we propose to carry out this work.

Objectives: To determine the prevalence of DRNN, highlight the risk factors and evaluate the quality of the management of this pathology.

Material and methods: A retrospective and descriptive including all newborns with respiratory distress and admitted to the ward during a 3 years period.

Results: Of the 661 hospitalized patients, 201 were admitted for respiratory distress, ie a prevalence of 30.4%. Respiratory distress was severe in 22.1% of cases. The most common functional sign was polypnea (38.4%). The associated signs were hyperthermia (34.2%), jaundice (18.4%) and hypotonia (12.1%). Peri-natal asphyxia was diagnosed in 12.1% of cases. Treatment was dominated by oxygen therapy with goggles or Hood (95.3%); CPAP was used once and artificial ventilation 8 times (4.2%). The hospitalization delay was less than 12 hours (45.3%). The mortality rate was 41.6%. Factors related to death in case of respiratory distress were: prematurity, low birth weight, and severity of respiratory distress.

Conclusion: Neonatal respiratory distress remains a frequent pathology of the perinatal period, its high mortality requires an appropriate antenatal and postnatal care urgent to improve the vital prognosis of the newborns.

Keywords*: respiratory distress, newborns, prevalence, risk factors, Gabon.*

INTRODUCTION

Respiratory distress is often linked to difficulties in adapting to extra-uterine life; it occurs in the neonatal period and can cause vital distress (DV), which corresponds to all acute symptoms testifying to a situation that is life-threatening and / or carries a risk of neuro-sensory sequelae [1]. Respiratory distress of the newborn remains a major concern for the pediatric neonatologist. It constitutes one of the main reasons for consultation and hospitalization in neonatology units [2] and represents an important cause of morbidity and mortality [3,4,5]. Worldwide, neonatal mortality is one of the leading causes of death for children under 5 years of age [6]. In developed countries, the management of respiratory distress in newborns is codified with specific indications and appropriate prevention strategies. In those under development, this care is made difficult because of the insufficiency of the technical platform, the high cost of management [5] and the lack of training of the staff in the new techniques of respiratory assistance. In Africa, in low-income countries, few data are available on neonatal respiratory distress-related mortality. In Gabon, a middle-income country, few studies have been conducted on the epidemiological, clinical, evolutionary and therapeutic aspects of neonatal respiratory distress. In order to improve the prognosis, we conducted this study with the aim of determining the prevalence, analyzing the mortality factors associated with respiratory distress and evaluating the quality of ventilatory management in our service to guide the choice. for a better strategy.

METHODS

The study was conducted at the Neonatal Resuscitation and Neonatology Unit at the University Hospital Center Libreville (CHUL). This service located in a referral hospital, has a capacity of 19 places and receives all newborns aged 0 to 28 days. The source of newborns is either the birth room or the maternity ward, or the peripheral health structures; public or private. This was a retrospective, analytical and descriptive study that included all newborns hospitalized for respiratory distress between June 1, 2011 and June 1, 2014. The criteria for non-inclusion were the absence of respiratory distress and neonates with secondary respiratory distress during hospitalization and exclusion criteria were non-exploitable records for missing data. Data were collected from the maternal birth registry and the newborn medical record, based on a preestablished record card. The parameters concerning mothers focused on maternal and obstetric socio-demographic data: age, number of gestures, parity, pregnancy monitoring according to the number of prenatal consultations (ANC), the existence of intercurrent pathologies during pregnancy; the place and mode of delivery, the appearance of the amniotic fluid, the type of presentation. Pregnancy was considered followed from 4 ANC. Newborn data included the following parameters: sex, postnatal age in days, gestational age at birth in weeks of amenorrhea, birth weight in grams, adaptation to first-minute extra-uterine life according to the APGAR score, the notion of resuscitation in the birth room. The adaptation was considered good for a score greater than or equal to 7, mediocre between 4 and 6, and the apparent state of death retained for a rating less than or equal to 3. We defined as premature, a birth occurred before 37 weeks, a low birth weight a weight value less than 2500 grams, a normal weight between 2600 and 3500 grams and a macrosomia for a weight greater than 4000 grams. Clinical data included assessment of respiratory distress by Silverman score [7] and respiratory function signs; the other associated signs have been listed. The score was defined by the presence of three signs such as: an increase in respiratory rate greater than 60 cycles per minute, signs of withdrawal or control; generalized or localized cyanosis that disappeared under oxygen. Signs of retraction included thoracoabdominal synchronization, intercostal circulation, xiphoidal funnel, flutter of the nose and expiratory moaning. Each sign was next to 0 to 2 depending on its importance. A score of 0 meant no respiratory distress; and located between 1 and 10 it allowed to evaluate the severity of the respiratory distress. The data concerning the management was the time of hospitalization or transfer and the ventilatory support technique used. Evolving data included length of stay and lethality. The data was collected using the Exel 2013 software. The statistical analysis was done with SPSS 19.1. Qualitative and quantitative data were expressed as a percentage. The statistical test used for frequency comparison was Pearson's chi-square test. The threshold of significance of the tests was a value of $p < 0.05$.

RESULTS

Epidemiological data

During the 3-year study period, of 661 hospitalized newborns, 201 were admitted for respiratory distress, with a hospital prevalence of 30.4%. We excluded 11 incomplete files. The study involved 190 newborns hospitalized for respiratory distress.

Mother's socioeconomic and obstetrical data

Mothers were young with an average age of 26.4 years and extremes between 16 and 44 years; had been gestating on average 3.5 times with extremes between one and fourteen times, were pauciparous with an average parity of 2.4 deliveries for extremes ranging from 1 to 10 deliveries. The pregnancy was most often poorly followed with an average of 2.8 ANC for extremes between 0 and 7 CPN. Table I shows the obstetrical characteristics of mothers recruited according to intercurrent pathologies during pregnancy; the place and mode of delivery, the appearance of the amniotic fluid and the type of presentation.

Table I : obstetric characteristics of women whose newborns have been recruited

characteristics	numbers (n)	Percentage (%)
Pathologies during pregnancy		
Anemia	36 /76	47, 4
High blood pressure	23 /76	30.3
Documented infections	22 /76	29.0
Premature rupture of membranes	20 /76	26, 3
Place of birth		
CHUL	146	76.8
Public peripheral structures	17	8.9
Private peripheral structures	17	8.9
Home	10	5.3
Delivery method		
Low track	138	72.6
Cesarean	52	27.4
Type of presentation		
Cephalic	175	91.1
Seat	11	5.8
Transverse	4	2.1
Appearance of Amniotic Fluid		
Clear	153	80.5
Tinted	31	16.3
Pea puree	6	6.0

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Just over one-third (76/190, 40.0%) of women presented with intercurrent disease during pregnancy. During delivery, the amniotic fluid was most often clear, the lower lining predominated, and cephalic presentation was the most common.

Parameters and clinic data of newborns Table 2 summarizes the parameters of the newborn by sex, postnatal age at admission, gestational age at birth, birth weight, APGAR score at the first minute of life, and performing resuscitation maneuvers.

Table II : parameters of the newborn

	number (n)	Percentage (%)
Sex		
Male	105	55.3
Feminine	85	44.7
Gestational age		
Prematurity	120	63.2
Ultimately	61	32.1
Post-mature	9	4.7
Age at admission (days)		
D0	157	82.6
D1	14	7.4
$\geq$ D2	19	10.0
Birth weight		
Low	123	64.7
Normal	62	32.6
Macrosome	5	2.6
APGAR score at 1mn		
$\leq$ 3	18	9.5
4-6	51	26.8
$\geq$ 7	121	63.7
Resuscitation maneuvers	69	61.9

 Among the study population, the sex ratio was 1.23 in favor of male newborns, with a predominance of preterm infants with an average age of 32 weeks. Newborns of low birth weight, were the most represented with an average weight of 1600 grams. The majority of newborns were hospitalized on the day of their birth. Most had a good adaptation to ectopic life and among those who had a poor adaptation, more than half benefited from resuscitation maneuvers from the birth room consisting mainly of aspiration, ventilation and mask ventilation. from oxygenation to nasal goggles. Table 3 shows

the clinical data of the neonate according to the severity of respiratory distress, respiratory signs and other associated signs.

Table III : clinical data of the newborn

Clinical data	number (n)	Percentage (%)
Severity of respiratory distress Light	76	40.0
Moderate	78	41.1
Severe	36	18.9
Polypnea	73	38.4
Cyanosis	27	14.2
Other associated signs Hyperthermia	65	34.2
Jaundice	35	18.4
Hypotonia	23	12.1
Perinatal asphyxia	23	12.1
Pallor	21	11.0
Malformations	14	7, 4

The symptomatology of respiratory distress was dominated by polypnea; according to the Silverman score, it was most often mild or moderate, and the main sign associated with respiratory distress was hyperthermia.

Care and evolution
Table 4 shows the modalities of management of newborns according to the delay before hospitalization, ventilatory techniques associated with oxygen therapy.

Table IV : hospitalization time, ventilation techniques

care data	Workforce (n)	Percentage (%)
Time (hours)		
<12	86	45.3
12-24	40	21.0
> 24	64	33.7
Ventilation techniques		
L nasal glasses / Hood	181	95.3
Mechanical ventilation	8	4.2
VS-PEP	1	0.5

VS-PEP : spontaneous ventilation in Positive Expiratory Pressure

he most used technique was oxygen therapy with nasal goggles or a bell (Hood). More than a third of the transfer times were less than 12 hours. The same proportion was noted for a delay greater than 24 hours.The evolution was characterized by an average hospital stay of 13.9 days with extremes ranging from 1 to 78 days. The mortality associated with respiratory distress was 41.6% (79/190).

Table 5 summarizes maternal and neonatal factors associated with death in respiratory distress. *Table V : factors associated with death*

Factors		numbers (N = 79)	Percentage (%)	p
Intercurrent pathologies	Yes	21	26.6	0.001
	No	58	73.4	
Place of birth	CHUL	58	73.4	0.72
	Private	9	11.4	
	Other public	8	10.1	
	Home	4	5.1	
Age at admission (days)	D0	66	83.4	0.548
	D1	7	8.9	
	≥J2	6	7.6	
Gestational age	Premature	58	62.0	0.03
	Term	17	44.0	
	Post-term	4	5.0	
Birth weight	Low	62	78.5	0.002
	Normal	17	21.5	
APGAR score	≤3	10	12.7	0.138
	4-6	25	31.6	
	≥7	44	55.7	
Severity of respiratory distress	Light	22	27.8	0.002
	Moderate	22	27.8	
	Severe	35	44.4	

Prematurity, low birth weight, and severe respiratory distress were related to death. Deaths in case of respiratory distress occurred even in the absence of intercurrent pathologies during pregnancy.

DISCUSSION

Respiratory distress is a common reason for admission to neonatal resuscitation. Our incidence is close to that of Faye in Senegal which is 34.8% [8], it is lower than that found by Lasme-Guillao in Côte d'Ivoire [9] with 44.0% of cases and higher than that found by Arafa [10], in Saudi Arabia with 27.0%. The hospital context that regulates the working conditions in these structures as well as the national health policies can explain the different values. The influence of intercurrent pathologies that occurred during pregnancy, on the appearance of respiratory distress is found in our series. In his study, Chnayna in Tunis [4] finds as main factors premature rupture of membranes, maternal uro-genital infection and toxemia of pregnancy. We did not find the association between the risk of respiratory distress and the birth context with meconial amniotic fluid. The caesarean section rate was comparable to that obtained by Kam in Burkina Faso [11] at 32.1% and higher than in the Lasme-Guillao et al study in Côte d'Ivoire [9], which found 11.6%. %. Numerous studies have shown that respiratory morbidity was higher following caesarean section compared to vaginal births [12]. Moreover, in our structure, the obstetric emergency context in which these cesarean sections are often performed is a prognosis for the newborn, which can explain the relationship with the occurrence of respiratory distress. The majority vaginal delivery mode is comparable to that of Lubala [13] who found 81.6%. The relationship between this pathway and the onset of respiratory distress is explained by the fact that a significant proportion of respiratory distress usually occurs in a context of neonatal infection including a higher risk of maternal-fetal transmission in the genital delivery. Male predominance has been found as by other authors [14, 15]. This respiratory susceptibility is explained by lower levels of cortisol in the amniotic fluid of boys compared to rates measured in girls; a molecule that plays a key role in lung maturation and respiratory adaptation [16]. The preferential involvement of neonates born prematurely or those born with a low birth weight is found as in the literature. Lubala, Democratic Republic of Congo [13] found that infants under 32 AS have developed respiratory distress, as well as those with a birth weight of less than 2000 grams. Flidel-Rimon [17] demonstrated that the morbidity associated with respiratory distress was higher in term infants with birth weights below the 3rd percentile on the Lubchenko curve. Mc Intire [18] found that the risk of respiratory distress is inversely related to birth weight in premature infants. The rate of neonates macrosomes was low compared to that of Faye [8] who found 11.0%. The link between macrosomia and respiratory distress has been established, especially in cases of poorly balanced maternal diabetes [14]. The rate of newborns having difficulty of adaptation to the birth is comparable to that of Faye [8] which finds in 40,2% of the cases a score of APGAR <7 and lower than Kam water Burkina Faso [11] who found an APGAR score <3 in 63.3% of cases. Pathologies of adaptation are manifested by an early onset of respiratory distress. The high rate of newborns with no difficulty in adaptation in our series may suggest the later onset of respiratory distress related to a pathology other than respiratory, such as congenital heart disease, posing the problem of the systematic search for etiology . The transfer delay was shorter than in the Faye study [8], in which it was 48 hours for half of the newborns and in poor transfer conditions. The respect of the conditions of transfer which takes into account the capacity of reception of the service explains the speed of our delays. Transport is organized and medicalized despite the absence of a national system of perinatal network for the organization of care. The rate of neonates with severe respiratory distress was low compared to Faye [8], in whom the majority of newborns had the same symptomatology. The frequency of the polypnea

is found identical to the Kam study [11] in which is noted in 90.0% of cases. Hyperthermia was associated with respiratory distress; confirming that neonatal infection usually manifests as respiratory distress [19]. Several techniques of ventilatory support have been practiced in the therapeutic management. The use of artificial ventilation was low compared to Chnayna in Tunisia [4] and Tsapis in France [15], as was the use of the non-invasive CPAP (Continuous Positive Airway Pressure) technique, which showed its effectiveness [20]. The use of other therapeutic means such as exogenous surfactant, conventional high-frequency oscillation in high-income countries is not usual in our environment, because of the high cost of this technology [4]. Mortality attributable to respiratory distress remains high as in Libya [21] and Tanzania [22] where it is 40.0% and 52.0% respectively. For Ben Hamida Nouali in Tunisia [23], the presence of respiratory distress was associated with a higher risk of death with a OR of 16 (p <0.003). The factors associated with death in the event of neonatal respiratory distress were identical to those of Lasme-Guillao et al [9] who found prematurity, low birth weight and severe respiratory distress. In our series, the occurrence of death was not related to the presence of intercurrent pathologies during pregnancy. This suggests that improving the prognosis of respiratory distress requires special involvement in strengthening therapeutic and diagnostic means by raising the technical plateau.

CONCLUSION
Respiratory distress is common in neonates and is an important cause of neonatal mortality, especially in preterm infants with low birth weight and severe respiratory distress. The prediction of potential risks must determine the modalities of pre- and post-natal care that requires rapid diagnosis, and the initiation of an emergency treatment adapted according to the etiology that improves the prognosis. Morbidity reduction requires better monitoring of pregnancies, prevention of maternal-fetal neonatal infections, pre-natal pulmonary maturation by corticosteroid therapy in the event of expected premature birth, and the dissemination of new noninvasive ventilation techniques in the elderly.
neonatal intensive care units.

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