



Study of mortality and morbidities of premature under 1500 g: NCHU of Rabat Experience

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Abstract

Background: Prematurity remains a major public health problem in developing countries and its reduction remains a crucial challenge for improving children's health. This study aimed to describe the risk factors for mortality and morbidity in premature whose birth weight is less than 1500 g.

Methods: This was a retrospective, descriptive, analytical study carried out over a period of 12 month (January to December 2015) in the neonatology department of the National Reference and Nutrition Center of the Rabat Children's Hospital. Included were all preterm infants under 1500g. Excluded from the study were newborns with hypotrophy and cases of malformation. The main socio-demographic data, maternal obstetric and neonatal data were collected from records of the National Center of Reference in Neonatology and Nutrition.

Results: One hundred and thirty-one preterm infants were included. 50.80% was female and 49.20% were male. Associated morbidity factors were rural origin 1[0.75-0.82] $p < 0.05$, no antenatal corticotherapy 1.02[0.75-0.82] $p < 0.05$ and multiple pregnancy ($p < 0.05$). Mortality factors were related to very low birth weight 1.39[2.1-3.59]

$p < 0.05$, neonatal distress 1.2[0.03-0.19] $p < 0.05$, and hemostasis disorders ($p < 0.05$).

Conclusion: The reduction of the mortality of the very premature infants requires a multidisciplinary care of the pregnant woman and a good follow-up in our context. . In parallel it is more than urgent to develop a national program for the prevention and care of premature babies in Morocco.

Keywords: Mortality, Morbidity, Preterm, birth weights, 1500 g.

Introduction

According to the World Health Organization (WHO) (1961), a birth is premature if it takes place before the 259th days following the first day of the last menstruation, That is to say before 37 weeks of Amenorrhea (WA) past. The gestational age (GA) expressed in WA is chronologically defined from the first day of the last rules to birth [1].

The late prematurity is usually distinguished (births entre 34 and 36 its past), moderate prematurity (32 to 33 WA), high prematurity (28 to 31 WA) and very high prematurity (< 28 WA) [2] Therefore, prematurity is a major problem of public health. Indeed according to WHO estimates 15 million newborns are born prematurely each

year, which represents more than one newborn in 10. However, about one million children die each year due to prematurity complications. Many survivors suffer from lifelong disability, including learning, visual and hearing impairments. [3] Premature infants under 1500g are likely to present multiple complications, ranging from metabolic disorders to neurological and sensory disturbances, sometimes irreversible [4] The main objective of this study is to analyze the Risk factors for mortality in premature birth weights lower than 1500g in our context.

Patients and Methods

1. Type and period of study: This is a retrospective cross-sectional study with descriptive and analytical aim, carried out over a period of one year, from January to December 2015.
2. Place of study: The study took place at the National Reference Centre for neonatology and Nutrition, which is a center located on the ground floor of the Rabat Child Hospital. Our Centre's current hospital capacity is estimated at 55 beds divided into three units:
 - A 12-bed medico-surgical Neonatal resuscitation unit, providing assisted ventilation and the various acts of resuscitation essential for life-saving.
 - An intensive care and post-resuscitation unit with 11 beds providing the various urgent care and monitoring outside the mechanical ventilation.
 - A standard care and rearing unit of 32 beds equipped with a room to receive the mothers who are breastfeeding their baby, recently arranged.There are two units in the delivery room of Souissi maternity. In addition to its units, the center provides a day-hospital activity and has an emergency, functional area 7 d/7 and 24h/24.

Study population

➤ **Inclusion criteria**

Included in the study were all premature birth weights lower than 1500g and

➤ **Exclusion criteria**

➤ All term newborns with a intrauterine growth retardation of less than 1500g were excluded from our study, all premature infants whose birth weight was greater than or equal to 1500g, those whose gestational age was not specified in the record

Methods and instruments

For data collection, the collection of information has been done in two stages.

A first database collected through the hospitalization records for newborns in the year 2015; was used to extract information on the workforce, sex, gestational age and some evolutionary data, namely the survival or death of premature infants.

A second compendium was completed for each newborn with sociodemographic, obstetric, maternal, pregnancy monitoring and surveillance data, and clinical admission data in the service.

The variables studied in premature patients were: gender, gestational age, anthropometric data, admission temperature, various changes during hospitalization, including respiratory, hemodynamic, Metabolic, infectious, neurodevelopmental, length of hospitalization.

The variables studied in the mother were: maternal age, occupation, marital status, inbreeding, home environment mode and place of delivery, surveillance of pregnancy (number of prenatal consultations), and taking during pregnancy, the history of gynecologist-obstetrics and Medical Surgical.

Definitions of terms

The gestational age was selected using one or more criteria: a theoretical term determined from the 1st day of the date of the last rules, the term ultrasound before 12 WA, or the morphological score of Farr.

Premature is any newborn born before 37 weeks of Amenorrhea (WA) (196 days gone but less than 259 days gone). The classification of the prematurity adopted is as follows:

- The very large prematurity 22 GA-26 GA + 6 days (less than 196 dayspast)
- The great prematurity between 27 GA -31 + 6days
- The simple prematurity la 32 GA -36 GA + 6 days[5]

Birth weight is the weight obtained by weighing the newborn right after birth.

Low birth weight is a birth weight lower than 2500g regardless of gestational age. we distinguish: The very low birth weight, which is a birth weight less than 1500g and the extremely small birth weight, which is a birth weight less than 1000 g [6]

Intrauterine growth retardation is a slowing of fetal growth resulting in a weight lower than the 10th percentile for gestational age. It can be harmonious (identical impairment of weight, size and possibly of the cranial perimeter) or disharmonious (predominant or exclusive impairment of weight) [5]

A healthy newborn has been defined by any birth with good adaptation to the ectopic Life (Apgar ≥ 7) and has no clinically detectable malformations with no associated morbidity.

Asphyxiation is assessed by the Apgar score, which is calculated from birth in the first minute, fifth and tenth minute of life. In a normal newborn it is greater than or equal to 7, when it is less than 7 it bears witness to anoxic suffering, if it is less than 3, it is said that it is a state of apparent death

A pregnancy is said to be followed if there have been at least three antenatal consultations.

Multiple pregnancies: It is a twin pregnancy, triplet; Quadruple or more [5]

Primiparous: Woman with only one pregnancy

Pauci-pare: Woman who had two to three pregnancies

Multiparous: Woman with more than four pregnancies up to 6 pregnancies

Large multiparous: Woman with 7 or more pregnanciesThe history was positive in the face of all clinically apparent symptoms in women and negative in the absence of symptom.

The woman was considered non-illiterate when she did not know how to write or read French Monthly income. According to a study carried out in 2007 by the High Planning Commission (CHP) of Morocco, it is estimated that the salary received is lower than 3000 dirhams, the socio-economic level is low and if the salary received is higher than 3000 dirhams, the socio-economic level is average. Other elements have been used such as the type of housing, the occupancy of the dwelling, the ground floor material, the drinking water, the type of lighting in the house, the type of sanitary facilities, the storage of household waste and the goods of Sustainable consumption [7].

Statistical analysis: The data entry was done on Microsoft Excel 2011 version 14.7.1 and the analysis of the results was done using the SPSS software (statistical Package for the Social Sciences) version 13.0. The quantitative variables were expressed on average and standard deviation, the qualitative variables were expressed as numbers and percentages. The quantitative variables were compared by the student test and the qualitative variables by the CHI2 or the exact Fisher test. The method used in multivariate analysis is logistic regression. The degree of statistical significance was retained for $P < 0.05$.

Results

During the study period we identified 205 premature birth weight 1500g, but only data of 120 meeting the inclusion criteria were analyzed (twin pregnancies and triplets included) the average maternal age was 28.53 ± 6.9 years. The primiparous accounted for 47.62% of the total

number against 34.29% of Pauciparous, 14.29% of multiparous and 3.80% (4) of large multiparous with an average of 2.08 children per woman. The majority of women gave birth by caesarian (70.48%) mainly for hypertension gestational in 23.80% of cases; 11.43% had a history of abortion, 7.62% still birth and 16.19% for preterm delivery. (Table1).

The study of the categories showed that of the 120 premature, 12 had a birth weight > 1000 g (10%), 108 (90%) had a birth weight between 1000 and 1499 g with extremes of 800 grams and 1480grams, the average was 12370 +/-179g.

The very large prematurity of 22 to 26GA + 6days represented 3% of the population, while the high prematurity, 27 to 31GA + 6days was 48% compared to 49% of single prematurity, 32 to 36GA + 6days. The associated pathologies were neonatal respiratory distress (42.50%), infection (20.83%) and neonatal asphyxia (13.33%). The majority had complications, the most frequent of which were the apnea (23.7%), jaundice (18.1%) and hemostasis disorders (9.6%).

In our series, there is no data on the time limit for the exact support in relation to the request. The minimum, depending on the actual age was one hour and the maximum of 120 hours. The delay in taking care of the service was mainly due to a problem of non-availability of space. The period of care, after birth, was, in 72.3% less than or equal to 12 hours and more than 48hrs in 1.6% of cases.

Table 1: sociodemographic and obstetric characteristics of moms.

characteristics	variables
Maternal Age ^a	28,53±,9
Martial Status	

Married	99(94.29)
Single	6(5.71)
Parity ^b	
Primiparous	50(47.62)
Paucipares	36(34.29)
Multiparous	15(14.29)
Lage Multiparous	4(3.80)
Living environment ^b	
Urban	79(65.83)
Rural	41(34.17)
consanguinity ^b	
1st degree	24(22.86)
2nd degree	11(10.48)
No	70(66.66)
Pregnancy Type ^b	
single	89(84.76)
twin	12(11.43)
Triple	4(3.81)
Delivery ^b	
Normal delivery	31(29.52)
caesarian	74(70.48)
Place of Birth ^b	
inborn	52(49.52)
outborn	34(32.38)

Corticotherapy ^b		Respiratory distress	51(42.50)
yes	40(38.10)		
No	65(61.90)	Infection	25(20.83)
PROM(>12h) ^b		MHD	11(9.17)
yes	41(34.17)	Jaundice	17(14.17)
No	64(60.95)	NA	16(13.33)
Maternal history ^b		Duration of hospitalization in NICU ^b	4d [2-7]
Still birth	8(7.62)	Duration of hospitalization in neonatology ^b	17d [3.5-29]
Abortion	12(11.43)	Total duration of hospitalization Evolution*	7.5d [3-21]
PROM	17(16.19)	Death	73(60.83)
GH	25(23.80)	Alive	47(39.17)
None	43(40.96)		
Pregnancy Monitoring ^b			
yes	82(70.10)		
no	23(21.90)		

^bStrength (%); a: medium ± standard deviation; >: Superior, GA: gestational age, GH: gestational hypertension.

Table 2 Neonatal characteristics

variables	Population of preterm infants N= 120	
Sex*		
Male	59 (49.20)	a:Mean ± standard deviation, *: effective (%), b:median [interquartile], GA: Gestational age, d: Days, MHD: membranes hyaline Disease ; NA: Neonatal Asphyxia. g:gram.
Female	61 (50.80)	
Birth Weight (g) a	1237.50±179	
GAa	31.20±3	
Size (cm) a	40±3.2	
CranialPerimeter (cm) a	27.37±2	
Associated Pathology*		

Table 3 :Factors related to morbidity-mortality

Independent Variables	Univariate Analysis			Multivariate Analysis		
	OR	IC à 95%	<i>p</i>	OR	IC à 95%	<i>P</i>
Age	0,99	0,97– 1.01	0,295	0.94	0.91-0.98	0.001
No antenatal	1.02	2 – 3.6	0.001	1.01	0.63-1.6	0.97
Corticotherapy						
Rural	1	0.75 –0.82	0.04	1.8	2.2 -3	0.001
Birth Weight						
1300-1500	1.17	0.60 – 2.3	0.654	0.86	0,38 –1.96	0.725
1000-1290	1.91	0.80 –0.96	0.009	0.39	0.53 –0.79	0.025
Less than 1000	3.24	2 –5.90	0.023	2.22	3.7 –8.15	0.002
Pregnancy						
Follow up	1.17	0.55 –2.52	0.676	1.01	0.40 –2.56	0.99
Not followed	0.85	0.43 -1.71	0.653	0.53	0.28 –1.32	0.173
Multiple	0.14	0.06 –0.34	<0.001	0.09	0.03 –0.29	<0.001
General causes						
NA	1.5	0.05 –0.42	< 0.001	1.2	0.03-0.19	< 0.001
RD	0.72	0.31-0.96	< 0.001	0.71	0.32-1.85	0.62

MHD	0.75	0.42-0.95	< 0.001	0.52	0.32-1.45	0.92
HD	0.65	0.51-0.78	< 0.001	0.42	0.02-0.55	<0.001

OR (odds ratio): adjusted by logistic regression; CI confidence interval. NA: Neonatal asphyxia. MHD: membrane hyaline disease, HD: hemostasis disorders, RD: respiratory distress

The morbidity factors associated with neonatal death in univariate analysis were rural origin, absence of antenatal corticotherapy and multiple pregnancies. Mortality factors in multivariate analysis were related to very low birth weight, neonatal asphyxia and hemostasis disorders

Discussion

Analysis of the results of our study identified the maternal-fetal risk factors for premature births, as well as the mortality factors. In Morocco, the main morbidities were prematurity, neonatal infections and perinatal asphyxia and the main causes of death were the small gestational age, the small birth weight, neurological and hemodynamic disorders.

In our series, we recorded 120 cases of very low birth weight infants representing 25% of all premature infants in the center against 37.5% in Tunisia [8] and 39.5% in Burkina Faso by Ouedraogo S et al [9].

The prevalence of small birth weight is very high in developing countries, where it is one of the leading causes of morbidity and mortality in newborns. This is a real public health problem [10]

The mortality rate observed in our study is comparable to those observed in several developing countries, notably in Tunisia and Cameroon . Raja R et al [11], and Naseem A et al, Neri E [12, 13] found respectively 54.3% and 73.5% .Efforts still need to be made as to the adequacy between the place of delivery and the obstetric risk and in the conditions of transfer.

In our series, marital status was not statistically related to mortality, these data are comparable to those obtained in Brazil and Cameroon [14, 15]. Many case-control studies had shown that the extreme ages of the mother were favourable or even predisposing factors to the occurrence of low birth weight [16,17]. Others had identified it as a risk factor for prematurity [16, 18].

Pregnant women in precarious social situations, whatever their reasons and often complex, are experiencing difficulties in accessing rights and care. [19, 20]. In our study the rural origin is linked to a bad prognosis of premature. Many studies have found similar results [21] .

The main factors of morbidity were early gestational age, very small birth weight, absence of antenatal corticotherapy and PROM. According to several authors, the main statistically related causes of mortality were [8,14, 15, 21, 22, 23, 24]: GA, birth weight, number of prenatal consultation, perinatal asphyxia and the severity of neonatal respiratory distress. In our study the preterms had at least another associated pathology and the most frequent were respiratory distress in 80% of cases, neonatal infection in 50% of cases and neonatal asphyxia in 35% of cases. The study of the evolution of our patients shows that 90% had complications during hospitalization; the most frequent were anemia with a rate of 87.2%, respiratory disorder in 68.3%. We have also shown the negative impact of the absence of antenatal corticotherapy. The transfer conditions were not studied in this work because the details were not on the files. Nevertheless we have raised 32% of out born focusing on the efforts to be made to detect the risks of premature delivery and to orient them in time to a higher level.

Conclusion

This work has identified the population of vulnerable women most at risk of premature birth. This population must be targeted by prevention and awareness-raising activities. In parallel it is more than urgent to develop a national program for the prevention and care of premature babies in Morocco. This program must integrate Community actions and involve the population in order to achieve.

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