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RESEARCH ARTICLE

Early Neonatal Mortality's Determinants in the Neonatology Department of Mohamed V Hospital in Tangier, Morocco

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ABSTRACT

Objective: This study aims to identify the determinants of early neonatal mortality in the neonatology department of Mohamed V hospital in Tangier.

Material and methods: This is a prospective study including all newborns hospitalized and deceased in the pediatric department of the hospital Mohammed V from June 1 to December 31, 2019. The recorded cases were processed and analyzed by SPSS software.

Results: 529 newborns were hospitalized in the pediatric department during the study period, of which 92 died (17.39%) between 0 and 7 days. Four leading causes justified this frequency: prematurity occupies first place (59%), followed by perinatal asphyxia (22%), neonatal infection (15%) in third place, congenital malformations (3%) in fourth place. Parturients aged between 20 and 35 years are the most affected (76%). The majority of women (71.4%) in our series had not undergone prenatal consultation (PNC) or had done so in insufficient numbers.

Conclusion: Neonatal mortality remains high. Improvement of this situation requires education of women, reinforcement of surveillance before, during pregnancy, during delivery, and the postpartum period, as well as effective management of premature newborns in the first week of life, should improve the neonatal prognosis by reducing the intra-hospital incidence of neonatal mortality in our setting.

KEYWORDS: Frequency - Causes - Early neonatal mortality.

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INTRODUCTION

Neonatal mortality is an indicator of the quality of obstetric and neonatal care, and it depends on the level of socio-economic development of a country. Although neonatal mortality has been observed to decrease in most parts of the world, it is still a significant problem in developing countries [1].

According to the World Health Organization (WHO), the number of newborns who died had decreased from 4.4 million in 1990 to 2.9 million in 2010. Several African authors were interested in this subject and showed 25.4% in the university hospital center of Blida, Algeria, 27.4% in Dakar, Senegal, and 25.9% in Ouagadougou, Burkina Faso [2].

Neonatal mortality is a significant public health problem in the world. Of the 130 million children born each year

worldwide, approximately 4 million die before their 28th day of life, 2 million of them in the first week of life. More than 5 million children died before reaching the age of 5, and almost half of these deaths were among newborns (from birth to 28 days) [3-5]. The factors associated with this neonatal mortality are not clearly identified.

The main objective of our study is to identify the determinants of early neonatal mortality in the neonatology department of the provincial hospital center (PHC) of Tangier.

MATERIAL AND METHODS

This prospective study includes all newborns hospitalized and who died in the pediatric department of Mohammed V hospital from June 1 to December 31, 2019. The recorded cases were processed and analyzed by SPSS software.

During the study period, 529 newborns were hospitalized in the pediatric department, of which 92 died (17.39%) between 0 and 7 days.

Inclusion and exclusion criteria

Neonatal mortality cases occurring between 0 and 7 days were included in this study. We excluded neonates admitted after seven days of life.

Study variables

Neonatal parameters: age (in days), weight, sex, ante- and post-natal history (place of delivery, Apgar score at the 5th minute, notion of resuscitation, Silverman score, as well as the presence of malformation), diagnosis of entry, and exit, period of death,

Sociodemographic and health parameters of the mother: age, obstetrical history, obstetrical index, follow-up and number of prenatal consultations (PNC), pathologies during pregnancy and labor, and delivery route.

Ethical considerations:

Our study was nonbinding. All information collected from the mother-child couple concerned was kept confidential.

RESULTS

The study collected 92 cases of early neonatal mortality out of a total of 529 newborns (born on-site or referred) admitted to the neonatology department, which gives an in-hospital frequency of 17.39% (Figure n°1). It also showed that 80% of deaths occurred within 24 hours of life, and 20% occurred after 24 hours.

The diagnosis of death was dominated by prematurity which is the first cause of neonatal mortality (59%), followed by perinatal asphyxia (22%), neonatal infection (15%) in the third position, congenital malformations (3%) in the fourth position, the last place is occupied by a postoperative cause (1%). (Figure n°2)

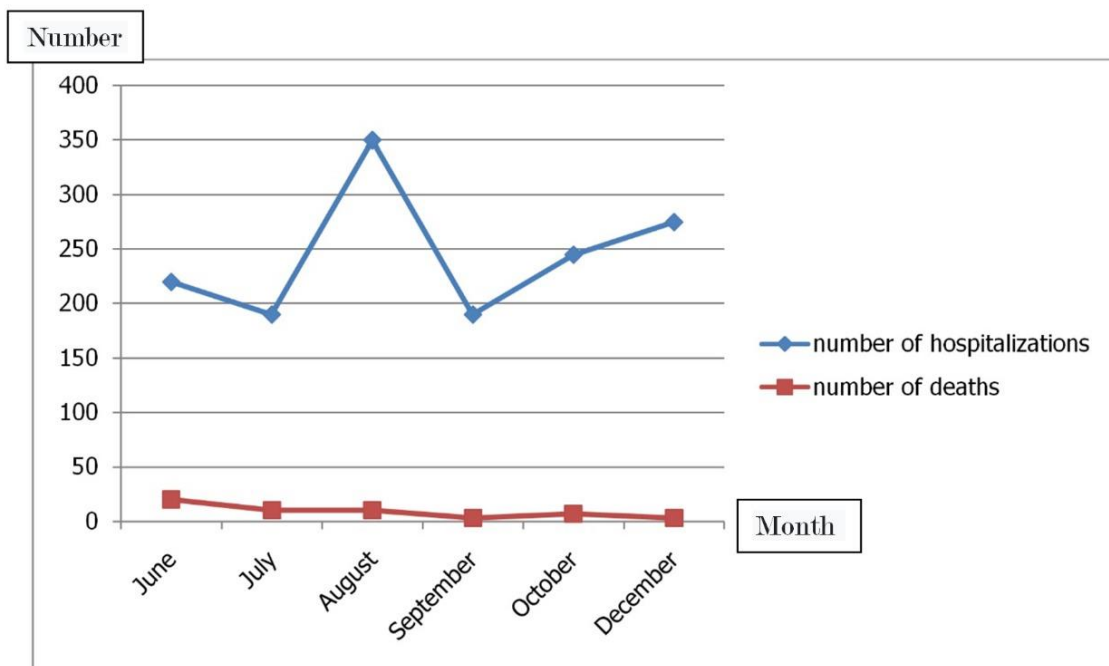


Figure n°1: Number of deaths compared to the number of neonatal hospitalizations.

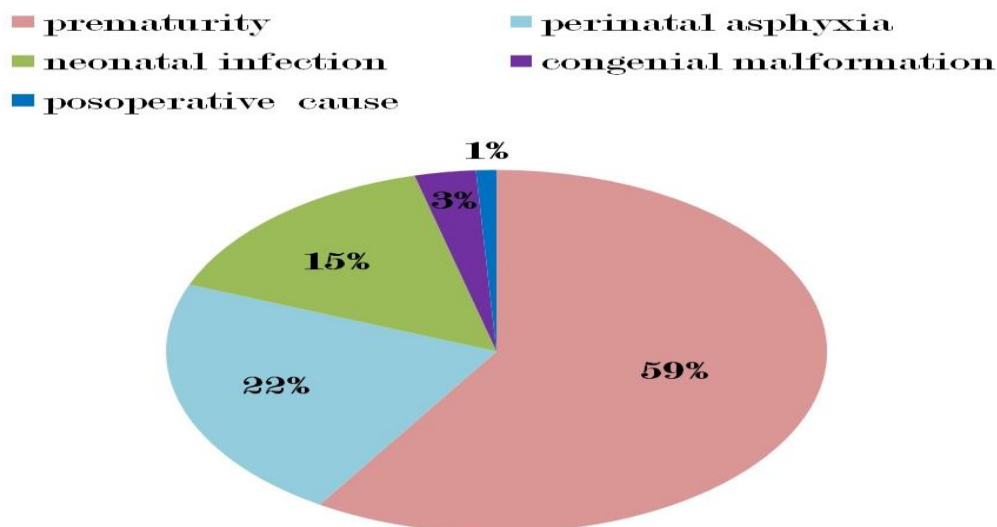


Figure n°2: Causes of death

Determinants related to the parents and the follow-up of the pregnancy:

Parturients aged between 20 and 35 years are the most affected (76%). Pregnancies are followed in 64% of cases. Urinary tract infection in 28.2%. (Table n° 1)

Table 1: Determinants related to parents and pregnancy follow-up

Variable	Number (n=92)	Percentage %
Maternal age		
<20 years	10	11
20à 35 years	70	76
> 35 years	12	13
Parity		
Primiparous	16	17
multiparous	76	83
Pathology during pregnancy		
Urinary tract infection	26	28,2 (p<0,005)
diabetes	8	8,6
Pregnancy toxicity	3	3,26
Genital infection	1	1,08
cardiopathies	1	1,08
number of prenatal visits		
0	9	10 (p<0,005)
1à3	24	26
>=4	59	64

Determinants related to delivery and the newborn:

Poor adaptation to extra uterine life was noted in 24% of cases, prematurity in 59% of newborns, low birth weight <1500g in 38%. (Table n°2)

DISCUSSION

Our study, despite its limitations, has allowed us to know some risk factors and causes of neonatal mortality in Tangier hospital center.

To prevent the occurrence of deaths of newborns at risk and to improve their survival, some authors [6] advocate the promotion of adequate nutrition to the mother, the prevention and management of infection during pregnancy, and the use of the kangaroo method in hypertrophic babies.

We found that newborns born to mothers with low levels of education were at least twice as likely to die. Several authors have shown that maternal illiteracy is a significant risk factor for neonatal mortality [6-8]. Indeed, educated mothers tend to have a good follow-up of the pregnancy, a good lifestyle, and diet, easy access to quality health care, and are more aware of the danger signs in the baby.

As we have found, several authors have cited a lack of pregnancy monitoring as a risk factor associated with neonatal mortality [6,9,10,11]. Indeed, good pregnancy monitoring allows for detecting and treating pregnancy complications that often lead to perinatal mortality [12].

A low Apgar score at the fifth minute, respiratory distress, and altered consciousness at birth were the most lethal risk factors in our study. These situations are primarily due to very dystocic deliveries [12,13] and expose the newborn to asphyxia and neonatal infection, which several authors consider as the main causes of neonatal death [6,9,7,14].

We did not find an association between maternal age and neonatal mortality. However, some authors [11, 12, 15]

have reported a strong association between maternal age and neonatal death, especially in the age range [15-20 years]. This age group is made up of adolescents and primiparous women who are prone to dystocic deliveries. About half (46%) of our patients had died within the first 24 hours. This is similar to the 53.3% of Tachiyeka et al. [14] and 56% of Adetola et al. in Nigeria [6].

Table 2: Determinants related to childbirth and the newborn

Variable	Number (n=92)	Percentage %
Way of delivery :		
vaginal delivery	48	48
cesarean section	44	52
Adaptation to extrauterine life:		
Apgar <7 (5th minute)	22	24(p<0,005)
Apgar >7 (5th minute)	52	56
Apgar unknown	18	20
Resuscitation in the birth room :		
yes	62	68(p<0,005)
no	30	32
Gestational age:		
22 WA à 28 WA	6	6(p<0,005)
28 WA à 34 WA	32	36(p<0,005)
34 WA à 37 WA	16	17
>= 37WA	38	41
Antepartum corticosteroid therapy not taken in preterm infants	66	71(p<0,005)
Birth weight		
<1500g	35	38(p<0,005)
1500g à 2499g	37	40
2500g à 3499g	17	19
>=3500g	3	3
Admission		
Direct	61	66
Referral	31	34

In our series, neonatal deaths were dominated by four leading causes, prematurity and its complications, neonatal infections, polymalformative syndrome, and neonatal asphyxia. These findings are almost in line with those of the World Health Organization (WHO), showing that prematurity and its complications are the first cause of neonatal mortality and those of the authors of many studies relating to Black Africa. Conversely, in other studies, neonatal infections, respiratory distress, or asphyxia have been shown to be the leading cause of neonatal mortality [16-19].

The majority of women (71.4%) in our series had not undergone prenatal consultation (PNC) or had done so in insufficient numbers. This has serious consequences, given that this consultation is an activity that leads to the prevention of several deplorable situations such as maternal infections (urogenital infections, malaria, etc.), as confirmed by our study, which can lead to neonatal infections, prematurity, abortion, stillbirths and low birth weight [1,20].

Referring to the birth weight of newborns, our study showed that 59.2% of cases had low birth weight. Similar

to those reported by Shrimton and Araujo in Brazil, these results are located between the low and high values reported in the literature [1].

According to the WHO, in terms of survival during the neonatal period, girls have a biological advantage such as faster lung maturation than male children and a lower risk of respiratory complications [1, 21].

A percentage of 58.3% of pregnancies were followed. Yet, according to WHO (2016) and worldwide, followed pregnancies represent 64%. According to WHO, two-thirds of deaths are from unattended pregnancies. Similarly, in Marrakech, Hanafi pointed out that the rate of unattended pregnancies reached 66% [2, 22, 23].

A slight predominance of the male sex (58.7%) in neonatal deaths is noted. Indeed, according to WHO (2006), girls have a well-described biological survival advantage during the neonatal period since the ratio of boys to girls in neonatal mortality in developed countries is 1.3. Compaore in 2009 and Harir in 2014 concluded that the male gender is more affected by neonatal mortality [23, 24]

A percentage of 57.14% of the deaths concerned birth weight between 500g and 2400g. These results are consistent with Compaore (2009), who reported that 75.3% of deaths in the early neonatal period occur in low birth weight infants. Also, Ongoiba (2010) noted that 57% weighted less than 2500 grams (g).

AUTHORS' CONTRIBUTIONS

All the authors have actively participated in the redaction, the revision of the manuscript, and provided approval for this final revised version.

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Infection was present in 25.8% of the deceased newborns. These results confirm Compaore (2009), who stated that 45.5% had moderate respiratory distress. [23]

Preterm death occurred in 61.9%, half of whom were born between 28 and 34 weeks of amenorrhea. In 2014, Blencowe related that prematurity had become the leading cause of death in children under five years old. Similarly, Harir (2014) and Compaore (2009) revealed a prematurity rate of 89% and 40.1% of cases, respectively [23].

The low birth route predominates with 82.14% of cases compared (2009), and Ongoiba (2010) states that vaginal delivery predominates in the cases of deaths with 75.6% and 74%, respectively. The results of Harir (2014) differ entirely, as a cesarean section was the most practiced for mothers of deceased newborns (65.83%) [23].

CONCLUSION

Neonatal mortality remains high. The improvement of this situation requires women's education, strengthening of monitoring before, during pregnancy, during delivery, and the postpartum period. As well as effective management of premature newborns in the first week of life should improve the neonatal prognosis by reducing the intra-hospital frequency of neonatal mortality in our environment.

CONFLICT OF INTEREST

Authors have no conflicts of interest to declare.

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