

Prematurity in Southern Morocco: Epidemiological and Evolutionary Profile of Newborns Hospitalized in the Neonatology Department of the Laâyoune Regional Hospital

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Abstract

Original Research Article

Introduction: Prematurity is a major public health problem and remains the leading cause of neonatal mortality worldwide. **Objective:** To study the epidemiological, maternal and developmental profile of premature newborns hospitalized in neonatology at the CHR of Laâyoune. **Materials and Methods:** This is a retrospective descriptive and analytical study conducted in the neonatology department of the Moulay Hassan Ben El Mehdi Regional Hospital in Laâyoune, over a period from January 2023 to January 2026. All premature newborns hospitalized during this period were included. **Results:** Of the hospitalized premature newborns, 80% came from the maternity ward and 20% were referred from other facilities. The average maternal age was 32 years. The majority of mothers lived in urban areas (75%), and 93% were married. A middle socioeconomic level was found in 41.7% of cases, and 20% of mothers had a secondary education. First-time mothers represented 64.4% of cases. Pregnancies were singleton in 85% of cases and multiple in 15%. Regarding prenatal care, 15% of pregnancies were not monitored; 48.3% of mothers had three prenatal consultations, while 5.3% had only one. The main maternal pathologies were premature rupture of membranes (12.1%), maternal infections (8.6%), and hypertension/preeclampsia (6.9%). Parental consanguinity was noted in 12.1% of cases, and a history of prematurity in 3.4%. In the neonatal period, 64.9% of newborns were born before 32 weeks of gestation. Vaginal delivery occurred in 72.7% of cases. A male predominance was observed (58.6%). Respiratory distress was the most frequent complication (76.7%). Several newborns received antibiotic therapy for a duration ranging from one day to two weeks. The outcome was favorable in 69.5% of cases. Neonatal mortality was 25.9%, and 6.9% of newborns were transferred to other facilities. **Conclusion:** Prematurity in southern Morocco remains associated with high morbidity and mortality. Improving prenatal care, preventing maternal risk factors, and optimizing neonatal care are essential to improving prognosis.

Keywords: Prematurity, Newborn, Neonatal Mortality, Risk Factors, Morocco.

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1. INTRODUCTION

Prematurity, defined as birth before 37 weeks of gestation, is a major public health issue worldwide. According to the World Health Organization, it affects approximately 15 million births each year and represents nearly 11% of live births. Despite advances in neonatology, prematurity remains the leading cause of neonatal mortality and a significant cause of death in children under five years of age [1]. Premature newborns are at high risk of morbidity due to the immaturity of their organ systems, particularly the respiratory, neurological, and immune systems. The most frequently observed complications include respiratory distress,

neonatal infections, and neurological disorders. Furthermore, recent data suggest that prematurity is associated with an increased risk of mortality not only in the short term but also in the long term, potentially persisting into adulthood [2]. The global burden of prematurity remains considerable, with significant disparities between high-income and low- or middle-income countries. Recent analyses of the Global Burden of Disease have shown that, despite an overall improvement in neonatal survival, prematurity continues to account for a significant proportion of infant morbidity and mortality [3]. Moreover, recent meta-analyses confirm that neonatal mortality among preterm infants

remains high, particularly in resource-limited settings [4]. Prematurity is a multifactorial condition involving maternal, obstetric, environmental, and sometimes genetic determinants. Among the most frequently identified risk factors are maternal infections, gestational hypertension, premature rupture of membranes, multiple pregnancies, and inadequate prenatal care [5]. These factors are often exacerbated in developing countries by adverse socioeconomic conditions and limited access to healthcare.

In Morocco, although significant progress has been made in reducing maternal and neonatal mortality, prematurity remains a serious concern, with notable regional variations. The southern regions, particularly Laâyoune, have specific geographical and socioeconomic characteristics that may influence the epidemiological and developmental profile of premature newborns. However, local data remains insufficient.

In this context, our study aims to analyze the epidemiological, maternal and developmental profile of premature newborns hospitalized in the neonatology department of the Laâyoune regional hospital center, in order to identify the main associated factors and improve prevention and management strategies.

2. MATERIALS AND METHODS

The medical records of premature newborns admitted to the neonatology department of the Moulay Hassan Ben El Mehdi Regional Hospital Center in Laâyoune, with a diagnosis of prematurity, between January 2023 and January 2026, were subjected to a retrospective descriptive and analytical analysis.

This study included all newborns born before 37 weeks of gestation and hospitalized during the study period. Incomplete or unusable records were excluded.

The following variables were examined: gestational age, mode of delivery, sex, and neonatal complications, including respiratory distress, infections, and other associated pathologies. Outcomes were analyzed based on hospitalization results (favorable outcome, death, or transfer).

In the mother, sociodemographic data (age, place of residence, marital status, socioeconomic level and level of education), obstetric characteristics (parity, type of pregnancy), prenatal follow-up (number of prenatal consultations) as well as the history and pathologies that occurred during the pregnancy (premature rupture of membranes, maternal infections,

arterial hypertension/preeclampsia, consanguinity and history of prematurity) were studied.

The data were collected from medical records and hospitalization registers, then analyzed descriptively in terms of frequencies and percentages.

3. RESULTS

In our retrospective descriptive and analytical study, we collected 60 records of premature newborns over a three-year period. During this period, 325 newborns were hospitalized in neonatology, representing a prematurity rate of 18.4%.

The majority of premature newborns came from the maternity ward (80%), while 20% were referred from other health facilities. (Figure 1).

The average maternal age was 32 years (Figure 2). The majority of mothers resided in urban areas (75%) and 93% were married (Figures 3, 4).

An average socio-economic level was found in 41.7% of families. (Figure 5).

First-time mothers accounted for 64.4% of cases (Figure 6). Parental consanguinity was found in 12.1% of cases, and a history of prematurity was noted in 3.4% of mothers.

Pregnancies were singleton in 85% of cases (Figure 7), and prenatal care was insufficient in a significant proportion of cases: 15% of pregnancies received no prenatal care. Furthermore, 48.3% of mothers had three prenatal consultations, while 5.3% had only one consultation during their pregnancy.

Regarding maternal pathologies, premature rupture of membranes was observed in 12.1% of cases, maternal infections in 8.6%, and hypertension and/or pre-eclampsia complicated 6.9% of pregnancies (Figure 8). Antenatal corticosteroid therapy was administered to 15 patients (37.5%). The distribution by sex showed a male predominance (58.6%) (Figure 9). Extreme prematurity was found in 64.9% of cases (Figure 10). Vaginal delivery occurred in 72.7% of cases (Figure 11). The main reason for hospitalization was respiratory distress related to prematurity, observed in 76.7% of newborns (Figure 12). During their hospitalization, 57 newborns received antibiotic and oxygen therapy, with treatment durations ranging from 1 day to 2 weeks. Breastfeeding was adopted in 37.5% of the newborns. The outcome was favorable in 69.5% of cases. (Figure 13).

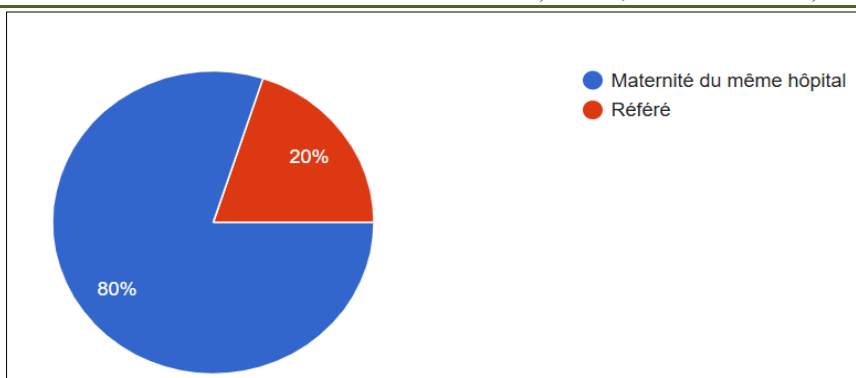


Figure 1: Distribution of new borns according to the mode of admission

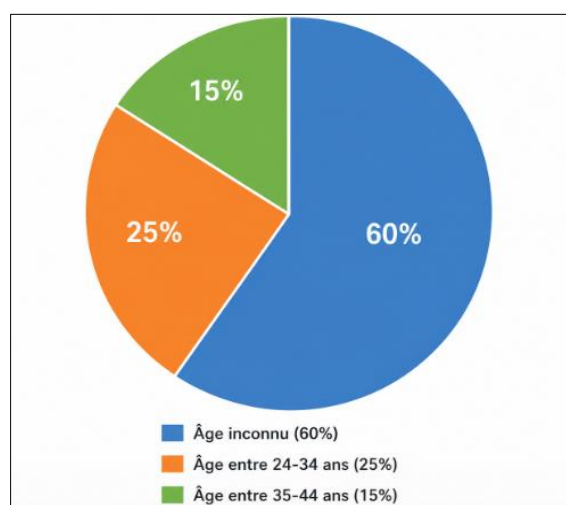


Figure 2: Distribution of mothers according to age

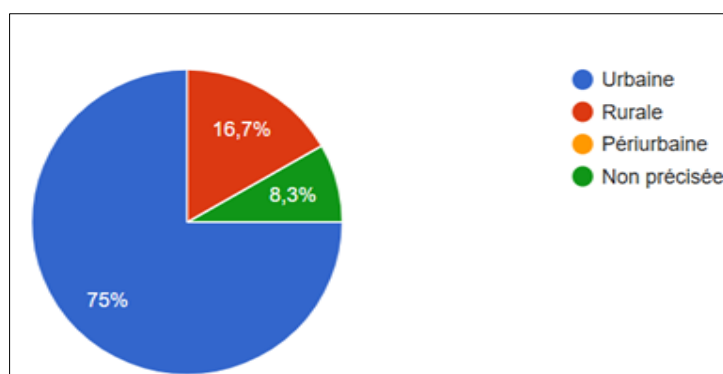


Figure 3: Distribution of hospitalized newborns according to their origin

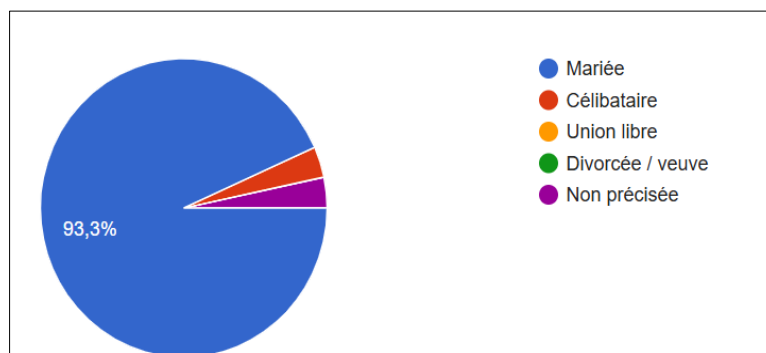


Figure 4: Distribution of women giving birth according to marital status

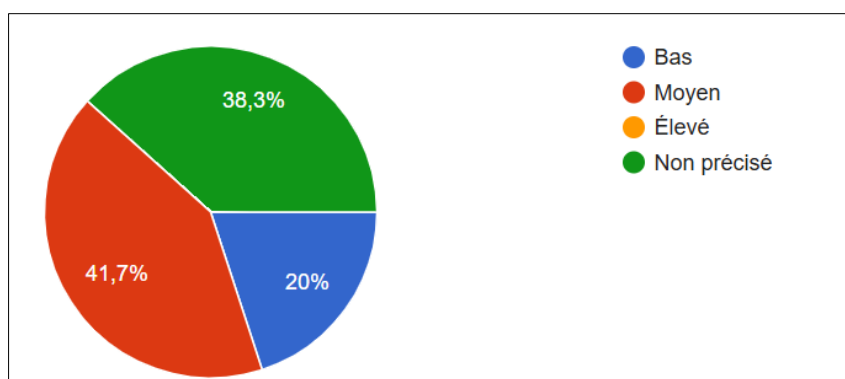


Figure 5: Distribution of women giving birth according to socio-economic level

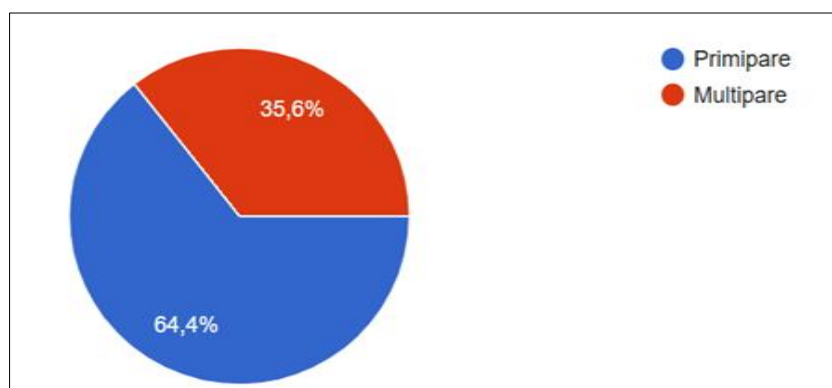


Figure 6: Distribution of mothers according to parity

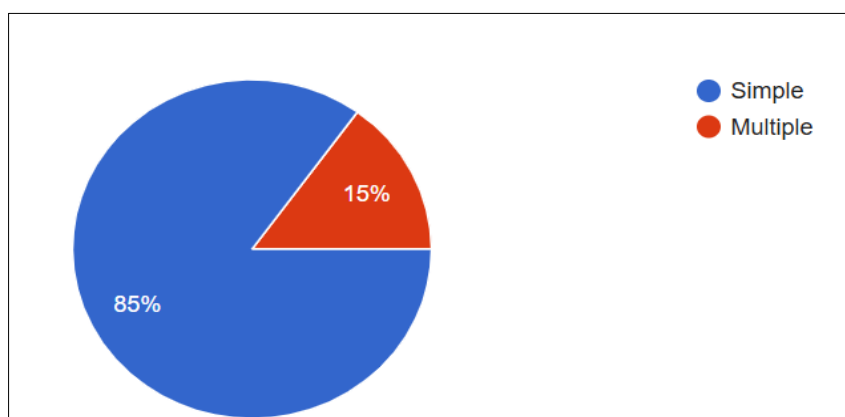


Figure 7: Distribution of pregnancies according to their type

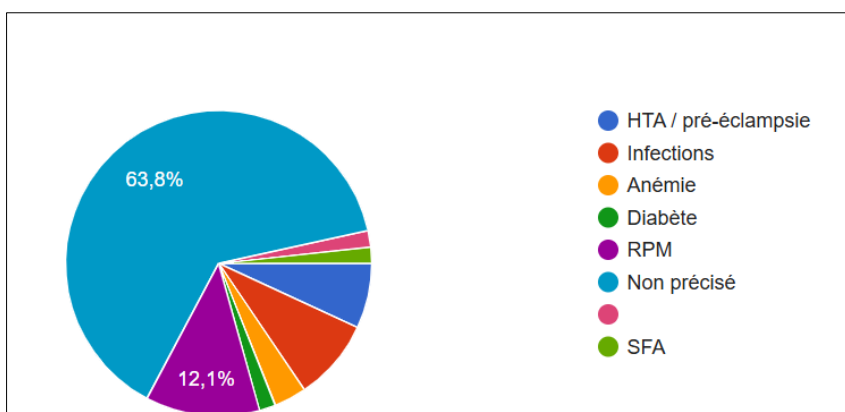


Figure 8: Maternal pathologies associated with premature births

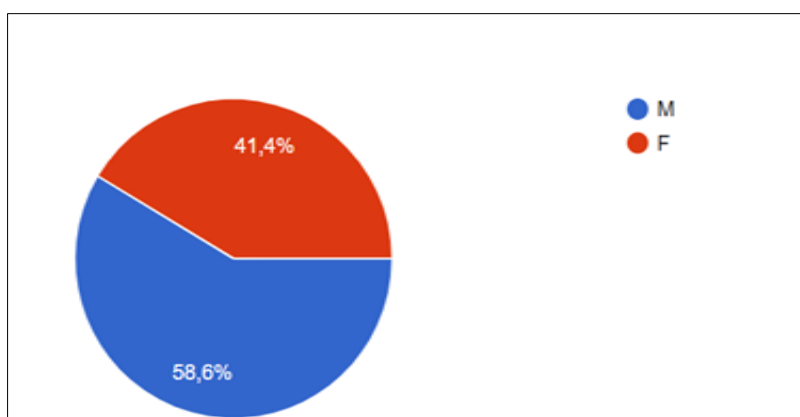


Figure 9: Distribution of newborns by sex

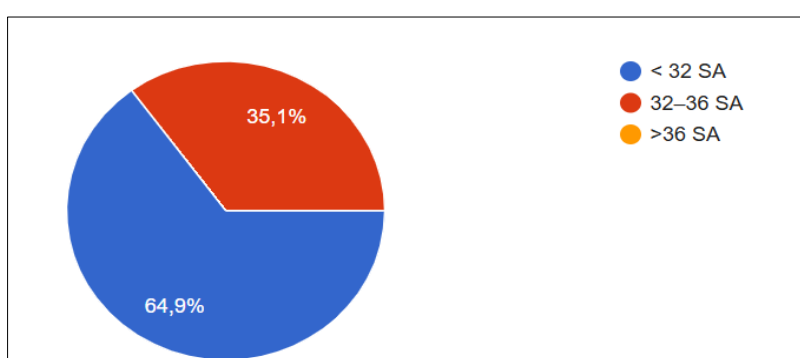


Figure 10: Distribution of newborns according to gestational age

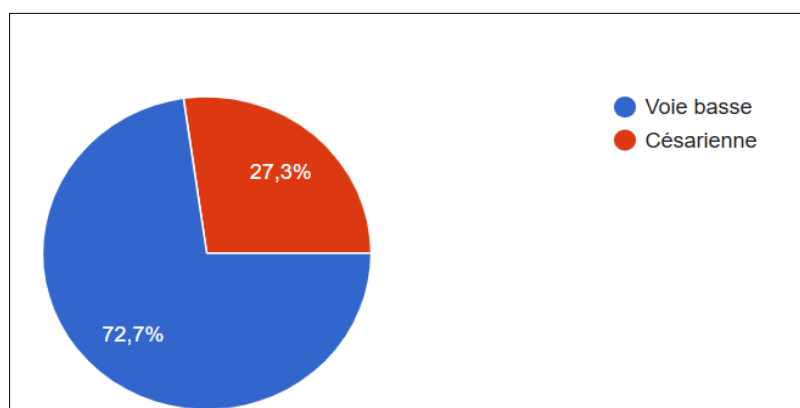


Figure 11: Distribution of modes of delivery

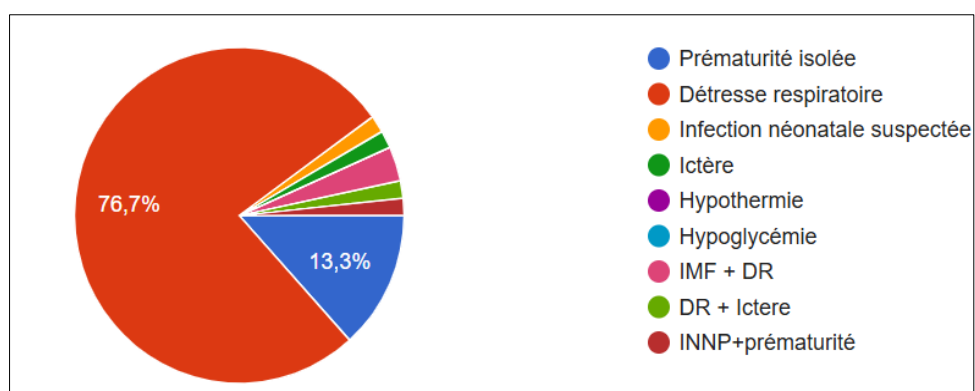


Figure 12: Distribution of premature infants according to the reason for hospitalization

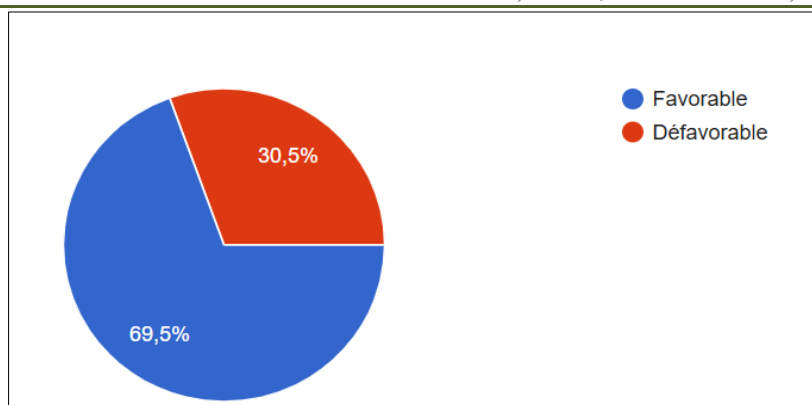


Figure 13: Distribution according to evolution

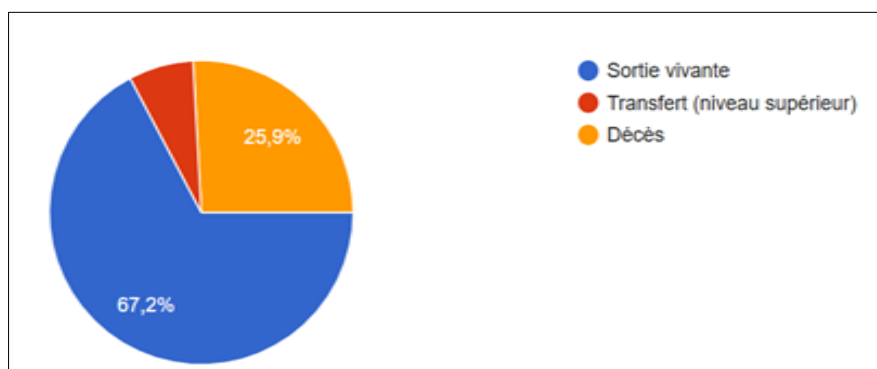


Figure 14: Distribution of newborns according to their hospital outcome

4. DISCUSSION

Prematurity remains a major public health problem, responsible for significant neonatal morbidity and mortality worldwide. In our study conducted at the Laâyoune Regional Hospital, the prematurity rate was 18.4%, which is higher than some data reported in the international literature (9% in high-income countries) but close to those observed in several low-resource countries, averaging 12% [6].

First-time motherhood was found in 64.4% of mothers, which is consistent with several studies that have identified first-time motherhood as a factor associated with prematurity. There is a correlation between first-time motherhood and prematurity; a French study on risk factors for prematurity demonstrated that first-time motherhood is a risk factor significantly linked to prematurity [7].

There is a correlation between primiparity and prematurity; a French study on risk factors for prematurity demonstrated that primiparity is a risk factor significantly linked to prematurity [7].

Prenatal care was inadequate in 15% of cases, constituting a major risk factor for prematurity. Several studies have demonstrated that inadequate prenatal care is associated with a significantly increased risk of premature birth as well as maternal and fetal complications.

Indeed, a cohort study of over 30,000 adolescent girls showed that the absence of prenatal care increased the risk of prematurity by more than 7 times (aOR = 7.4) [8].

Similarly, other studies have confirmed that women receiving adequate prenatal care have a significantly reduced risk of prematurity and low birth weight, independent of sociodemographic factors [9].

Furthermore, more recent studies have shown that not only the quantity but also the quality and content of prenatal care influence the risk of prematurity, with inadequate care being associated with an increased risk of premature birth [10].

Finally, several observational studies have identified inadequate prenatal care as an independent factor associated with prematurity, with significant odds ratios even after adjusting for maternal and obstetric factors [11].

Furthermore, the main maternal pathologies identified in our study were premature rupture of membranes (12.1%), maternal infections (8.6%), and hypertensive disorders of pregnancy, including hypertension and pre-eclampsia (6.9%). These results are consistent with data from the literature, which identify

these obstetric complications as major determinants of prematurity [12,13].

Premature rupture of membranes is recognized as one of the most frequent causes of preterm birth, being involved in a significant proportion of preterm deliveries, particularly due to the risk of ascending infection and early activation of labor [14].

Similarly, maternal infections, particularly genitourinary and intra-amniotic infections, play a key role in the pathophysiology of prematurity via inflammatory mechanisms involving the production of cytokines and prostaglandins that promote the onset of preterm labor [13-15].

Furthermore, hypertensive disorders of pregnancy, particularly pre-eclampsia, are strongly associated with prematurity, often of iatrogenic origin, due to the need to terminate the pregnancy to prevent maternal and fetal complications [16].

These observations are consistent with those of large epidemiological studies and reports from the World Health Organization, which identify infections, premature rupture of membranes and hypertensive disorders as the main medical causes of preterm birth worldwide [12].

Antenatal corticosteroid therapy was administered to 37.5% of patients in our study. This rate remains relatively low compared to international recommendations, which advocate systematic use in any woman presenting with a threat of preterm labor between 24 and 34 weeks of amenorrhea, and in some cases up to 36 weeks of gestation depending on the clinical context [19, 20].

Numerous studies have demonstrated the major benefit of antenatal corticosteroid therapy on neonatal morbidity and mortality. Corticosteroids, by accelerating fetal lung maturation, significantly reduce respiratory distress syndrome, intraventricular hemorrhage, and necrotizing enterocolitis. A Cochrane Collaboration meta-analysis showed a significant decrease in neonatal mortality among newborns exposed to antenatal corticosteroid therapy [19-21]. Similarly, the World Health Organization guidelines emphasize the importance of this intervention, particularly in resource-limited countries, where it is a simple, inexpensive, and highly effective measure [20].

The low rate observed in our study could be explained by several factors, including delayed diagnosis of threatened preterm labor, limited access to prenatal care, and organizational constraints within healthcare facilities. This finding underscores the need to strengthen early detection strategies and improve adherence to obstetric care protocols.

Optimizing the use of antenatal corticosteroid therapy thus represents a major lever for improving neonatal prognosis in our context, particularly by reducing the incidence of respiratory complications, which were the main cause of hospitalization in our series.

Extreme prematurity accounted for 64.9% of cases, reflecting the severity of the newborns treated in our unit. A male predominance was observed (58.6%), which is also reported in several studies suggesting a greater vulnerability of males to prematurity and its complications [22]. The cause of the male predominance is not yet fully understood [23].

Respiratory distress was the main indication for hospitalization (76.7%). This result is consistent with the pulmonary immaturity of premature newborns and confirms the central role of respiratory distress syndrome in neonatal morbidity [12-17].

Several studies have shown that respiratory distress is one of the main causes of admission to neonatal intensive care units, particularly in very premature infants, with an incidence inversely proportional to gestational age [17, 18].

These data are also consistent with reports from the World Health Organization, which highlight that respiratory complications, including respiratory distress syndrome, are a major cause of morbidity and mortality in premature newborns worldwide [12].

Antibiotic therapy was administered to several newborns for a duration ranging from 1 day to 2 weeks, reflecting the frequency of suspected or confirmed neonatal infections in this context of prematurity [24, 25]. Indeed, premature newborns have an increased risk of infection due to the immaturity of their immune system and the frequency of associated perinatal risk factors, often justifying early empirical antibiotic therapy.

The outcome was favorable in 69.5% of cases, which remains encouraging given the context of prematurity. However, the observed neonatal mortality rate was 25.9%, reflecting the potential severity of this high-risk population [26]. This rate, although high, remains comparable to that reported in some hospital series in resource-limited countries, where access to specialized care and neonatal resuscitation technologies may be restricted.

Furthermore, 6.9% of newborns were transferred to other facilities, likely due to the need for more specialized care, particularly in cases of severe respiratory distress or major complications. This recourse to transfer underscores the importance of organizing perinatal care networks in improving the prognosis of premature infants [27].

Overall, these results confirm that, despite progress in neonatology, prematurity remains associated with significant morbidity and mortality, particularly in resource-limited settings, requiring the strengthening of prevention strategies, early intervention and optimization of neonatal care [26-28].

In terms of outcomes, the situation was favorable in 69.5% of cases. However, neonatal mortality remained high (25.9%), highlighting the seriousness of prematurity in our context. This rate appears significantly higher than that reported in high-income countries, where advances in neonatal intensive care have led to a significant reduction in mortality.

However, our results remain comparable to those observed in several African studies. Indeed, sub-Saharan Africa has the highest neonatal mortality rates in the world, estimated at approximately 26–27 deaths per 1,000 live births according to recent data from the World Health Organization and UNICEF [29, 30]. Furthermore, a systematic review confirmed that prematurity is a major factor in neonatal mortality in this region, often associated with complications such as respiratory distress, infections, and low birth weight [31].

Furthermore, a recent meta-analysis of low birth weight newborns in Africa reports high mortality rates, with a strong association between prematurity and neonatal death [32]. These data confirm that, in resource-limited settings, prematurity remains a major determinant of neonatal prognosis.

Thus, the mortality rate observed in our study, although high, is consistent with regional trends. The differences observed compared to high-income countries can be explained by variations in access to specialized care, the availability of neonatal intensive care units, prenatal monitoring, and the implementation of preventive interventions such as antenatal corticosteroid therapy.

5. CONCLUSION

Prematurity in our context remains associated with significant morbidity and mortality. Improving prenatal care, preventing maternal risk factors, and strengthening neonatal care are essential to improving the prognosis of premature newborns.

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