

Neonatal Diseases Managed in the Peripheral Hospital: a study at the sidi Mohamed ben Abdellah; Morocco

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Abstract:

Neonatal pathologies encompass a wide range of diseases and disorders affecting newborns (age ≤ 28 days). These conditions can have diverse origins, whether infectious, genetic, metabolic, hemodynamic, respiratory, digestive, neurological or other.

This is a retrospective analytical and descriptive study, carried out in the department of pediatrics the Peripheral Hospital Sidi Mohamed Ben Abdellah of Essaouira, Morocco; over a period of 6 months from June 11, 2023 to December 11, 2023

The total number of neonates hospitalized was 140 cases with a sex ratio of 1.15. The mean age was 4.68 ± 6.87 days, with extremes ranging from 1 to 28 days. The prematurity rate was (21.7%) and (31%) of newborns had a low birth weight.

More than half (61%) of pregnancies were poorly attended, with medical deliveries accounting for (94%), and in (66%) were by vaginal delivery versus (33%) by caesarean section. Infectious anamnesis was positive in (35%).

Prematurity was the main reason for hospitalization (21%). Hyperleukocytosis or leukopenia was observed in (29.53%) of cases. CRP was above 20 mg/l in (24.61%). Newborns receiving antibiotic treatment accounted for (83%).

The average hospital stay was 4.72 days. Prematurity was the primary diagnosis (40.7%). The mortality rate was (6%), while the outcome was favorable in (91%) of the newborns in the study.

Neonatal pathologies are frequent and remain associated with high mortality, hence the interest in creating an interconnected care system capable of managing them by guaranteeing regular monitoring of pregnancies, special attention during deliveries, and adequate equipment.

Keywords: morocco; neonatal; prematurity; peripheral hospital

Introduction

Neonatal pathologies encompass a range of diseases and disorders affecting newborns (age ≤ 28 days). These conditions can have diverse origins, whether infectious, genetic, metabolic, hemodynamic, respiratory, digestive, neurological or other. They account for a significant proportion of infant mortality and morbidity worldwide.

The first 28 days of a child's life are a high-risk period for various types of injury, which can lead to death or have a lasting effect on development and the rest of the child's life. Of the 130 million births worldwide each year, four million newborns die before one month of age, 99% of them in poor countries, from causes that are mostly known [1, 2] and largely preventable or accessible to treatment [3]. Thus, far more than a public health problem,

neonatal mortality is a genuine global development issue. Because newborns account for up to 40% of deaths of children under 5 years of age [2], accelerating the reduction of neonatal mortality is imperative if we are to achieve target 4 of the United Nations Millennium Development Goals [4].

The management of neonatal diseases requires a delicate approach, involving precise diagnoses, specialized medical interventions and close coordination between members of the medical team. Conditions such as neonatal infections, metabolic disorders and congenital anomalies require an individualized approach to ensure optimal care.

This study, carried out over a 6-month period in the pediatrics department of the Sidi Mohamed Ben Abdellah outpatient hospital and involving 240 cases of neonatal pathologies, had the following objectives :

- Evaluate the prevalence of neonatal diseases and their evolution.
- Evaluate the management of neonatal pathologies in peripheral hospitals.

Patients and methods

Our work is a retrospective analytical and descriptive study, carried out in the pediatrics department, Sidi Mohamed Ben Abdellah outpatient hospital in Essaouira, Morocco ; over a 6-month period from June 11, 2023 to December 11, 2023.

We included in this study all newborns aged from the 1st hour of life to 28 days, hospitalized for a neonatal pathology and having benefited from care within the pediatrics department.

An evaluation form was drawn up for each patient, enabling us to assess the various epidemiological, clinical, paraclinical (biological and radiological), etiological, therapeutic and evolutionary data.

Results

140 neonates were admitted to the neonatology department. The month of December was predominant with a rate of 21%, i.e. 30 newborns; the age of admission of patients varied between one and 21 days of life, with a mean age of 4.68 ± 6.87 days and a median corresponding to one day of life. Females predominated (54%), representing 75 newborns with a sex ratio of 0.86. More than two-thirds of newborns were at term (73%), while 29 were premature. 35% of cases had a positive infectious history (Table I).

Anamnestic factors	Number of cases	Percentage
Inexpliquée Unexplained perinatal asphyxia	5	3,56 %
Maternal fever 48h before and 6h after	5	3,57 %
Urogenital infections in the 3rd trimester	12	8,57 %
Tainted or foul-smelling fluid	19	13,57 %
Unexplained prematurity	6	4,28 %
Premature rupture of membranes >12hrs	6	4,28 %
Prolonged labor >12h	4	2,85 %

Table I: Distribution of anamnestic factors in positive infectious history.

The majority of deliveries were medicalized, with a percentage of 94%. Newborns born at home accounted for 6%. The majority of deliveries (66%) were performed vaginally, with 4% accomplished by episiotomy or instrumental delivery (vacuum, forceps). Weight averaged 2697.35 ± 921.87 g, with extremes of 1kg500 and 4kg600g. More than two-thirds of newborns (69%) had a normal birth weight.

The mean Apgar score at the first minute was 7.82 ± 2.49 . More than two-thirds of newborns had an immediate cry (94.4%). However, the latter was absent in 5.6% of cases. Only 16% of hospitalized newborns required resuscitation after birth.

Almost a third of newborns were hospitalized for prematurity (21.7%).(Table II)

Reason for hospitalization	Number of cases	Percentage
Prematurity	29	21%
Suspected neonatal infection (stained fluid)	21	15%
Mother in intensive care	2	1.4%
Moaning	12	8.6%
Diabetic mother	4	2.9%
Macrosomia	7	5%
Respiratory distress	20	14.14%
Hypotrophy	7	5%
Neonatal jaundice	14	10%
Cyanosis	5	3.6%
Fetal distress	11	7.9%
Forceps delivery	1	0.7%
Refusal to feed	6	4.3%
Suspicion of trisomy	1	0.7%

Table II: Distribution of newborns by reason for hospitalization

Half of the newborns were eupneic (50%); however, more than a third had polypnea (35%). The majority of neonates had a normal heart rate (86%).

More than half the neonates had normal O₂ saturation at the time of hospitalization (68%). The majority (85%) of neonates (119) had normal temperature. Mean blood glucose was 0.83 ± 0.45 , with extremes ranging from 0.4 to 2.53 g/l. Cardiovascular examination was normal in the majority

of neonates (87%). Pathological (13%): Heart murmur Tachycardia Bradycardia. Almost a third of newborns showed hypotonia (33%).

130 cases (92.85%) had a complete blood count (CBC), it was normal in 39 cases (30%), abnormal in 91 cases (70%) and absent in 35 cases (4.2%). Protein-C-reactive assay was performed in 130 cases (92.85%), and was positive (≥ 20 mg/l) in 32 newborns (24.61%) (Table III).

Biological examinations		Number of cases	Percentage %
Complete blood count (CBC)	Anemia	26	20
	hyperleukocytosis	46	28
	Leukopenia	2	1,53
	hrombocytopenia	20	15,38
Positive Protein-C-reactive		29	22,30

Table III : Breakdown by biological examination

Cytobacteriological examination of urine was carried out in 29 cases (20.71%). It revealed the presence of urinary tract infection in 9 newborns (31.03% of cases).

Bilirubinemia was performed in 10 newborns (7.1% of cases), and was found to be abnormal in 6 newborns (4.3%).

Chest X-rays were performed in 50 newborns (35.7% of cases), and were abnormal in 18 newborns (36%).

Abdominal ultrasound was performed in 5 newborns (3.57% of cases), and was abnormal in 2 newborns (40% of cases).

Cardiac ultrasound was performed in 9 newborns (6.42% of cases), and was abnormal in 2 newborns (22.22% of cases).

Trans-fontanelar ultrasound was performed in 10 newborns (7.14% of cases), and was abnormal in 2 newborns (20% of cases).

Main diagnoses (table IV)

Pathology	Number of cases	Percentage
Neonatal infection	33	23,5 %
Transient respiratory distress	14	10 %
Neonatal jaundice	6	4,3 %
Trisomy 21	1	0.71 %
Perinatal asphyxia	12	8,4 %
Heart disease	1	0.71 %
Macrosomia	16	11,42 %
Prematurity	57	40,7 %

Table IV : Distribution by etiology

Therapeutic data : The majority of neonates, 83% of cases in our series, were treated with antibiotics. Bi-antibiotic therapy was used in two-thirds of patients (65%).

The combination of C3G and gentamicin was used in half the neonates (49.62%), while the combination of Tienam and C3G was used in 8 neonates (5.85%). 90 patients (64.28%) received oxygen therapy

Pathology	Number of cases	Percentage
Perinatal asphyxia	2	1,42 %
Prematurity	2	1.42 %
Respiratory distress	1	0,71 %
Neonatal Infection	3	2.14 %

Table V : Breakdown by main etiologies of deaths in our series

- 10 neonates (7.14% of cases) received hemodynamic support with vasoactive drugs (adrenaline)
- 14 newborns (10%) were transfused with red blood cells, platelets or fresh frozen plasma.
- Diuretics were administered in 4 newborns (2.85% of cases).
- 3 neonates, i.e. 2.14% of cases, received intensive or conventional phototherapy.
- 8 neonates, or 5.71% of cases, received injectable vitamin K (Konakion).
- The average hospital stay was 4.72 ± 4.06 days, with extremes of one day and 23 days.

Outcome during hospitalization: The majority of neonates admitted for hospitalization (91%) had a favorable outcome. 8 neonates (6%) died during their hospital stay. 4 newborns were discharged against medical advice (3%).

Among the 130 diagnoses retained, the main etiologies of death were as follows:

Discussion

The neonatal period is a critical time in human life when a newborn must adapt to a new environment and make several physiological adjustments essential to life [5]. Neonatal mortality contributes significantly to under-five mortality [5]. According to 2018 estimates, more than 2.4 million children died before their second month of life [6]. Neonatal mortality rates differ between regions and nations. A third of neonatal deaths worldwide occur in sub-Saharan Africa, with around 34 deaths per 1,000 live births. The risk of neonatal death is around 55 times higher in the country with the highest mortality rate than in the country with the lowest mortality rate [7]. The neonatal mortality rate in Ethiopia is around 30 per 1,000 live births [7].

The main neonatal diseases are sepsis, respiratory distress syndrome, birth asphyxia and necrotizing enterocolitis, accounting for 26%, 23%, 19% and 7% respectively [8]. In Ethiopia, the most common diseases leading to neonatal death are sepsis, birth asphyxia, necrotizing colitis (NC) and respiratory distress syndrome (RDS) [9]. Factors contributing to neonatal death include shortage of neonatologists and pediatricians, inadequate

diagnostic tools, delayed diagnosis and lack of quality care and treatment for neonatal conditions [10]. In resource-constrained countries such as Ethiopia, neonatal diseases take a heavy toll on families, society and the healthcare system. Preventive and curative strategies exist to mitigate the impact. But improvements in outcomes are limited. Preventive approaches focus on maternal health before birth, such as maternal vaccination and efforts to ensure a healthy pregnancy [11, 12]. As for curative approaches, diagnostic tools are limited and diagnostic results take longer. Delayed results often lead to a rapid deterioration in the condition of the newborn [13]. This has serious repercussions, including chronic lung disease, neurodevelopmental abnormality and long-term disability requiring ongoing hospitalization [14]. There are also significant increases in expenses and burdens for survivors and carers. Therefore, early identification of neonatal disease with appropriate antibiotic therapy can be effective in reducing neonatal mortality, cutting costs and reducing antibiotic resistance in the community [15]. Detecting disease at an early stage with minimal cost is an area of interest for many researchers [16].

Conclusion

The management of neonatal pathologies in the periphery is a complex but essential challenge to ensure the health and well-being of newborns. Effective measures must be put in place to rapidly identify problems and provide adequate treatment, especially in cases of perinatal asphyxia where time is of the essence.

Adequate training of medical staff in the delivery room and appropriate equipment for emergency interventions are essential. This can help reduce the risk of complications and improve outcomes for newborns facing critical situations right from birth.

However, it is also important to recognize the limitations of the resources available in peripheral settings, and to work to improve access to specialist care where necessary. In addition, ongoing research into neuroprotective treatments could open up new avenues for improving long-term outcomes for newborns facing neonatal complications.

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