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ORIGINAL ARTICLE

CAUSES OF READMISSION AMONG PREMATURE INFANTS DURING THEIR FIRST THREE MONTHS OF LIFE IN CAMEROON

Daniel Armand Kago-Tague[1,2], Lynda Miaffo Sonkeng[1], Claude Ginette Kalla[1], Dominique Enyama[3], Jeannette Epee Ngoue[1], Evelyn Mungyeh Mah[1,2].

[1]Department of Pediatrics, Faculty of Medicine and Biomedical Sciences, University of Yaoundé, Yaounde, Cameroon,

[2]Department of Pediatrics, Faculty of Medicine and Biomedical Sciences, Yaoundé Gynaeco-Obstetrics and Pediatrics Hospital, Yaounde, Cameroon,

[3]Faculty of Medicine and Pharmaceutical Sciences, University of Dschang, Dschang, Cameroon.

ABSTRACT

Introduction: Premature neonates are at greater risk of readmission after discharge from neonatology. The aim of our study was to determine the causes of these readmissions during the first three months of life.

Methodology: We conducted a retrospective descriptive study of the records of prematurely born children who had stayed in the neonatology department of the Yaoundé Gynaecological-Obstetric and Paediatric Hospital over a period of 5 years. The data collected were summarised in the form of mean ± standard deviation, frequencies and percentages.

Results: Of the 1485 premature babies admitted at birth, 82 had been readmitted during the first three months of life, i.e. an incidence of 5.5%. The mean birth weight was 1348 ± 392 g and the sex ratio was 1.4. Seventy-two preterm infants had been readmitted seven days after their first hospital discharge (87.8%) and two infants (2.4%) were readmitted more than once during the first three months of life. The main causes of readmission were acute respiratory infections (30.5%), severe anaemia (23.2%), severe malaria (11%) and undernutrition (4.9%). The mortality rate was 10.9%.

Conclusion: In urban Cameroon, premature infants are frequently readmitted during the first three months of life. The main causes of readmission were severe anaemia and respiratory infections. Close monitoring must be stepped up in the post-natal period.

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Introduction

According to the World Health Organisation (WHO), premature babies are those born before 37 completed weeks of amenorrhoea (SA).[1] They are at risk of multiple early and late complications.[2,3] Their survival rate remains low in countries with limited resources compared with developed countries, due to the lack of adequate equipment.[4] Premature babies who survive need close monitoring after discharge from hospital because of the risk of motor, sensory, respiratory or digestive sequelae (feeding and growth disorders) that can be identified in the first year of life.[5] These children require long-term monitoring, as they are at risk of later deficits and disabilities that need to be detected and treated as early as possible.[3,5]

What's more, premature newborns who are discharged from hospital are often subject to re-hospitalisation.[6] Escobar et al and other authors reported that the frequency of readmission of premature babies was 1.5 to 3 times higher than that of full-term babies.[6] In Cameroon, this rate of readmission was 32.7% according to the study by Mah et al.[7] The frequent causes of readmission of premature babies mentioned by most authors were respiratory disorders, jaundice and feeding and growth problems.[9,10,11,12] Early and appropriate care could prevent the onset of these conditions and improve their living conditions. To achieve this, it is important to identify the causes of readmission of premature babies. For this reason, we set out to study the causes of readmission during the first three months of life of premature newborns who had stayed at the Yaoundé Gynaecological-Obstetric and Paediatric Hospital.

Methods

This was a retrospective study covering the period from 1 January 2014 to 31 December 2018, i.e. 5 years. The study took place at the Yaoundé Gynaecological-Obstetric and Paediatric Hospital. Preterm newborns

Address for Correspondance: : Daniel Armand Kago Tague, Gynaeco-Obstetrics and Pediatric Hospital, 4362 Route de Ngousso Yaounde–Cameroon.
Email: kagog2@yahoo.fr

who had already spent at least 24 h in the neonatology department and who were readmitted before reaching 3 months postnatal age were included. Criteria for non-inclusion included discharge against medical advice, congenital malformations, those who had undergone surgery and medical records that could not be analysed. Readmission was defined as a hospital stay of more than 24 hours. The data were collected using a survey form which sought to identify: the characteristics of the premature baby (sex, term of birth, birth weight, notion of resuscitation); the post-hospital follow-up and re-hospitalisation (mode of feeding, number of consultations, time to readmission, age at readmission, diagnosis of readmission, outcome).

Data were entered and analysed using SPSS version 23 software. Quantitative data were summarised as mean ± standard deviation, while qualitative data were presented as frequencies and percentages. Patients were recruited after obtaining parental consent. Research authorisation was obtained from the Yaoundé Gynaeco-Obstetric and Paediatric Hospital. Ethical clearance was obtained from the Institutional Research Ethics Committee of the Faculty of Medicine and Biomedical Sciences of the University of Yaoundé I. Confidentiality was respected.

Results

During the study period, 1485 premature babies were discharged alive from the neonatal unit. Of these, 82 had been readmitted during the first three months of life, i.e. an incidence of 5.5%. Of these, 48 were male (58.5%), i.e. a sex ratio of 1.41. The mean gestational age at birth was 33.4 ± 2.2 SA. The mean birth weight was 1348 ± 392g with extremes ranging from 800-2400g. Twenty-two newborns had been resuscitated at birth (26.8%). (Table 1)

Table 1. Clinical characteristics of newborns at birth.

Variables	Frequency (N=82)	Percentage (%)
Sex		
Male	48	58,5
Female	34	41,5
Gestationnel Age (WA)		
<28	5	6,1
[28-32]	33	40,2
>32	44	53,7
Birth weight (g)		
<1500	36	43,9
[1500-2000]	30	36,6
>2000	16	19,5
Birth resuscitation	22	26,8

At the time of readmission, 38 of the former premature babies were exclusively breastfed (46.3%) and 70 had received at least one consultation before readmission (85.4%). The median time to readmission was 30 days, with extremes of 15-42 days. Seventy-two very premature babies (87.8%) had been readmitted seven days after their first discharge from hospital and two children (2.4%) had been readmitted more than once during the first three months of life. Nine old premature babies (10.9%) died during readmission. (Table 2)

Table 2. Characteristics of postnatal follow-up.

Variables	Frequency	Percentage (%)
Feeding method		
Exclusive breastfeeding	38	46,3
Artificial feeding	13	15,9
Mix feeding	31	37,8
Number of systematic visits		
0	12	14,6
1	36	43,9
2	32	39,1
3	2	2,4
Time to rehospitalisation		
Early (<7 days)	10	12,2
Late (=7 days)	72	87,8
Number of re-admissions		
1	80	97,6
>1	2	2,4
Deaths	9	10,9

The most frequent reasons for consultation at readmission were, in descending order, fever (37; 45.1%), difficulty breathing (20; 24.4%) and paleness (12; 14.6%). The pathologies leading to readmission were acute respiratory infections, in particular pneumonia (20; 24.4%) and bronchiolitis (5; 6.1%), followed by severe anaemia (19; 23.1%), sepsis (18; 22%), severe malaria (9; 11%) and malnutrition (4; 4.9%). We recorded one case of surgical pathology, in particular a strangulated inguino-scrotal hernia (1.2%) (Table 3).

Discussion

In this review of the medical records of former premature infants at the Yaoundé Gynaeco-Obstetric and Paediatric Hospital in Cameroon, the main causes of readmission were severe anaemia and infections, mainly respiratory infections.

We found an incidence of readmission of 5.5% during the first three months of life. This incidence was similar to that described by other authors who carried out an evaluation over shorter periods not very different from ours, ranging from 2 weeks, 30 days and two months.[6,8,10,12] However, this proportion was low compared with studies extending over periods that took into account those rehospitalised during the first and second years of life, with rehospitalisation rates varying

Table 3. Causes of readmission.

Causes de readmission	Frequency	Percentage (%)
Pneumonia	20	24,4
Bronchiolitis	5	6,1
Sepsis	18	21,9
Meningitis	5	6,1
Urinary tract Infection	5	6,1
Endocarditis	1	1,2
Ostéoarthritis	1	1,2
Severe anemia	19	23,2
Severe malaria	9	10,9
Malnutrition	4	4,9
Surgical Pathology	1	1,2

between 30 and 40%.[14,15,16] The rate we found in our study was very probably underestimated since we only took into account newborns readmitted to our hospital, some of whom had undoubtedly been hospitalised in other health facilities.[17] In addition, we do not have a system for locating and alerting patients who have been lost to follow-up, which was high in our context, up to 72% according to Mah et al[8,17]

In our study, infections were the most frequent cause of rehospitalisation. These recurrent infections could be explained by the sometimes prolonged use of antibiotics during their first stay in neonatology, which would favour the occurrence of late neonatal infections by altering the commensal digestive flora.[19] Among these infections, acute respiratory infections were the leading cause of readmission, as described by some authors [8,10,16,20], while other studies reported digestive disorders as the leading cause.[6,15] Given this high rate of readmission for respiratory infections and the frequency of respiratory syncithial virus (RSV) infections in older preterm infants, prophylaxis against RSV infections should be applied systematically, as recommended by various learned societies.[21,22,23] Severe anaemia was the second most common reason for readmission. Studies by Mah and Dainguy showed that anaemia in premature babies was significantly associated with birth weight and gestational age, so that low birth weight and very premature babies were more likely to present with severe anaemia.[8,15,24] This is all the more true as we are not yet systematically using erythropoietin in this high-risk population[4], as is strongly recommended in conjunction with iron supplementation.[25]

Conclusion

Readmissions of premature infants during the first three months of life were frequent. The main causes of readmission were severe anaemia and respiratory infections. Close monitoring of these infants during their post-natal period will need to be stepped up. Cohort studies will help to determine the factors associated with their readmission.

Compliance with Ethical Standards
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Conflict of Interest None

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