Scientific Research Publishing

Open Journal of Pediatrics, 2025, 15(4), 621-629
https://www.scirp.org/journal/ojped
ISSN Online: 2160-8776
ISSN Print: 2160-8741

Care for Low-Birth-Weight Newborns in the Reference Hospitals of the City of Kara in 2023

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How to cite this paper: Talboussouma, S.M., Tchagbele, O.-B., Fiawoo, M., Segbedji, K.A.R., Folly, A., Kombieni, K., Dassaboute, L., Djeunda, N.B., Kounake, D.C., Boume, M.A., Douti, K.N. and Azoumah, K.D. (2025) Care for Low-Birth-Weight Newborns in the Reference Hospitals of the City of Kara in 2023. *Open Journal of Pediatrics*, **15**, 621-629.
https://doi.org/10.4236/ojped.2025.154059

Received: June 20, 2025
Accepted: July 27, 2025
Published: July 30, 2025

Abstract

Introduction: Low birth weight is a public health problem due to its prevalence and the resulting neonatal consequences. **Objective:** Evaluate the management of low birth weights in the three hospital centres in the town of Kara. **Methodology:** This was a retrospective, transversal and descriptive study based on documentary analysis. **Results:** Among these newborns, 91% were premature and 09% were hypotrophic. At admission, 47% of FPNs were in good clinical condition, while 983 were in fair clinical condition, and 4,7 were in poor clinical condition. The main complications observed were neonatal infection (75%), neonatal jaundice (52%), and respiratory distress (97%). Breastfeeding (93%) and KMC (70.94%) were the primary preventive care methods. The outcome was favorable in 54, 27% of cases, but lethal in 36, 61% after an average hospital stay of 6 days. The weight gain at discharge was 59, 52 g/kg of body weight. More than half of the hypotrophs had a weight gain greater than 15 g/kg/day. **Conclusion:** The prevalence of LBW remains high and linked to modifiable factors. It is crucial to continue to strengthen the capacities of health centres, improve mothers' education, and standardize care protocols.

Keywords

Low Birth Weight, Premature, Hypotrophs Management, SMK

1. Introduction

Low birth weight (LBW) is a public health problem because of its prevalence and

the resulting neonatal consequences. Around 45% of children under the age of five who die are newborns, 60% - 80% of whom are premature and/or small for their gestational age [1]. Each year, nearly 20 million newborns worldwide are born with low birth weight (LBW), with over 90% occurring in low- and middle-income countries [2]. In India, despite economic progress, states such as Maharashtra still report high rates of LBW. A study published in BMJ Global Health revealed that although the national LBW rate declined from 26% to 18% between 1993 and 2021, some regions continue to experience rates as high as one-third of all births [3]. In sub-Saharan Africa, these rates vary considerably from one country to another. In 2019-2021, LBW prevalence was 22.9% in Mauritania, 16.5% in Mali and 12.2% in Madagascar [4].

Despite substantial progress in health care over the last 10 years, the survival, health, growth and neurological development of preterm and low-birth-weight infants remain a cause for concern in many countries, and the pace of improvement has been slow [1]. With this in mind, the World Health Organization (WHO) has published new recommendations on the care of premature and low-birth-weight babies. These recommendations take into account new data showing that simple interventions can considerably reduce their mortality [1].

In Togo, several hospital studies have looked at various aspects of low birth weight in both Lomé [5]-[8] and Kara [9], with incidences varying from one region to another.

To update data and assess progress in the management of low-birth-weight newborns in the Kara region, which is characterized by poor availability of human and material resources, we undertook this study with the general objective of evaluating the management of low-birth-weight newborns in the three referral hospitals in the city of Kara.

2. Materials and Methods

The pediatric wards of the University Hospital (UH) Kara, the Regional Hospital Centre (RHC) Kara, and the *Hôpital Mère Enfant* "Save Our Soul" (HME SOS) in Kara served as the study setting**.** This was a retrospective, cross-sectional, descriptive study of the records of newborns hospitalized for LBW in the pediatric wards of these centers from January to December 2023.

All records of newborns hospitalized for low birth weight during the study period were included in this study. Records of newborns with low birth weight for which information was not available or was incomplete were excluded. Sampling was exhaustive of the records of low-weight newborns hospitalized during the study period.

The data collection tools consisted of the department's hospitalization register and the medical records of premature and/or hypotrophic newborns received in 2023. Low birth weight (LBW) is defined as a birth weight of less than 2500 grams, regardless of gestational age. Prematurity refers to birth before 37 weeks of gestation and is classified as follows: Extreme prematurity: <28 weeks, Very preterm:

28 to <32 weeks, Moderate preterm: 32 to <34 weeks, Late preterm: 34 to <37 weeks. Intrauterine growth restriction (IUGR) or hypotrophy refers to a weight that is insufficient for gestational age. A newborn is considered hypotrophic when the birth weight is below the 10th percentile for their gestational age. In our study, we defined hypotrophy as any newborn with a birth weight insufficient for gestational age.

The parameters studied were: the age of the mothers, their level of education, their obstetric history, pathologies during pregnancy and the parameters of the newborn, *i.e.*, weight, complications, and treatment.

The data collected was entered and analyzed using the kobocollect software. Tables and graphs were produced using Microsoft Office Excel 2019. Microsoft Office Word 2019 was used for word processing.

3. Results

3.1. Frequency of LBW

Out of a total of 1418 hospitalized newborns, we identified 314 LBWs. Two hundred and thirty-four (234) newborns with LBW were included in the study, including 146 at the University Hospital, 49 at the Regional Hospital, and 39 at the MCH SOS. The incidence of LBW was 22.14%. Eighty (80) LBWs were not included for lack of usable information. Of these LBW newborns, 82.91% were premature and 17.09% were hypotrophic born at term.

3.2. Socio-Demographic Characteristics

The average age of the mothers was 28.62, with extremes of 14 and 49. The most common age group was 18 to 29, with 42.74%. Almost half the mothers (44.02%) lived in rural areas, and 50.85% were housewives. 52.99% had at least primary school education, and 93.16% were married.

Concerning their obstetrical history, 44.87% of the mothers were primiparous and 29.91% were multiparous. They had had fewer than 4 antenatal contacts in 59.83% of cases. The mean age of onset of ANC was 18.44 weeks, with extremes of 4 weeks and 36 weeks. The mothers in 61.04% (n = 141) had received 2 to 3 doses of sulfadoxine-pyrimethamine. The most frequently diagnosed pathologies were malaria (7.79%) and vaginitis (6.93%). Premature rupture of membranes and anamnios were found in 14.1% and 1.71%, respectively. The women had not undergone any antenatal paraclinical examination in 32.47% of cases.

3.3. Clinical Data for LBW

Inborn babies accounted for 62.39%. In 3.85% of cases, newborns were delivered at home. Males predominated in 53.85% of cases. The average weight of the newborns was 1607.46 g, with extremes ranging from 800 to 2450 g (**Table 1**).

On admission, 60.68% of newborns had a normal temperature of between 36.5˚ and 37.5˚. Oxygen saturation was greater than 92% in 84.62% of cases. Cyanosis was noted in 8.5% of children.

Table 1. Breakdown of LBW by weight on admission.

	Premature babies	Hypotrophs	Total
<1000	13 (6.70%)	1 (2.5%)	14 (5.98%)
[1000 - 1500]	61 (31.44%)	8 (20%)	69 (29.49%)
>1500	120 (61.86%)	31 (77.5%)	151 (64.53%)
Total	194 (82.91%)	40 (17.09%)	234 (100%)

3.4. Paraclinical Data

Blood counts were performed in 143 newborns, 30.07% of whom were normal. The hemoglobin level (TH) was less than 14 g/dl in 9.8% (n = 14) of cases, and the white blood count was greater than 25,000/mm^3 in 60.14% (86). One hundred and twenty-two (122) newborns had CRP tests, of which 37.7% (46) were positive. Blood urea and creatinine levels were taken in 11 children, 80% of whom were normal.

Forty (40) children had blood glucose tests, 67.5% (n = 27) of whom had normal blood glucose levels. In 42.74% of cases, moderate prematurity (born between 32 and 34 weeks of amenorrhea) had been diagnosed (Table 2).

Table 2. Distribution of NPFs according to the diagnosis used.

	Workforce	Percentage
Extreme prematurity	34	14.53
Average prematurity	100	42.74
Early prematurity	38	16.24
Extreme prematurity	2	0.85
Hypotrophic premature babies	20	8.55
Hypotrophic at term	40	17.09
Total	234	100

The newborns had received breast milk in 93.59% of cases, and the age of initiation of breastfeeding (chronological age) was on average 1.43 days, with extremes of 0 and 14 days.

29.06% of the LBWs had not received kangaroo maternity care (KMC). The onset of KMC according to chronological age was 2.11 days on average, with extremes of 0 and 16 days.

Eighty-six (86) newborns (36.75%) had received antibiotic therapy, 22.22% oxygen and 20.52% phototherapy.

No complications occurred in 8.97% of LBW patients (Table 3).

Table 3. Distribution of LBW according to complications.

	Workforce	Percentage
Neonatal infections	86	36.75
Neonatal jaundice	48	20.52
Respiratory distress	28	11.97
Deaths	88	37.61
Anemia	14	5.98
Hypothermia	9	3.85
Hypoglycemia	2	0.85
Convulsive seizures	1	0.43
No	21	8.97

3.5. Development of LBW

The outcome was favourable in 54.27% of cases, with a mean discharge weight of 1769.24 g. The extremes were between 1050 g and 2600 g. We noted that 15.98% of premature babies and 20% of hypotrophic babies born at term gained more than 60g per day.

The case fatality rate was 37.61% (n = 88) of which 82.95% (n = 73) were premature and 17.05 (n = 15) were hypotrophic.

The average length of hospitalization was 6 days.

4. Discussion

4.1. Frequency of Low Birth Weight

The frequency of low birth weight in our series was 22.14%, lower than in the study by Azoumah *et al.* where low birth weight presented in 30.8% of hospitalized newborns [9]. This difference may be explained by the improvement in the health situation associated with the introduction of national health programs aimed at pregnant women (prevention and management of malaria, prevention and management of anemia). On the other hand, it is higher than the international average of 17% [2], which can be explained by our country's low social and health status.

The predominance of premature babies (82.91%) among LBW corroborates international data showing that a large proportion of LBW are premature [1]. This finding highlights the importance of focusing interventions on preventing prematurity and improving antenatal monitoring.

4.2. Socio-Demographic Aspects

The most represented age group is 18 to 29 years (42.74%), comparable to the results of Traore in Mali in 2011, where the most represented age group was 20 to 24 years [10]. We can try to explain this by the expansion of sexual activity in this

age group with a high frequency of pregnancies, sometimes unintentional. Most of the mothers had a primary school education (52.99%). According to Silvestrin et al, mothers with a high level of education had a 33% lower risk of having a child with an LBW than those with a low level of education. On the other hand, an average level of education did not show any significant protection [11]. These results underline the importance of maternal education in preventing LBW. In rural areas, housewives make up the majority of the population, and their incomes are lower. Mothers' low purchasing power means that they are unable to feed themselves properly during pregnancy and to provide an environment conducive to a healthy pregnancy.

A significant number of mothers lived in rural areas (44.02%). Housework and farming in rural communities are activities that require a great deal of time and effort. As a result, pregnant women are very tired and lack the rest necessary for the development of the fetus. Some women have no access to antenatal care because of the distance from health centres. The precarious living conditions in the villages are not conducive to a balanced diet. All these factors can lead to premature deliveries and intrauterine growth retardation.

4.3. Obstetrical History

In our study, nearly 60% of mothers had attended fewer than four antenatal clinics (ANC), and around a third had not had any paraclinical examinations, which is a well- documented risk factor for LBW [12]. The low uptake of quality antenatal care reflects the structural challenges faced by health facilities in semi-urban and rural areas, particularly in terms of human resources and equipment. These shortcomings are similar to those reported in other African contexts [5] [13], and justify the WHO's recommendations for an overall improvement in the quality of care for preterm and low-weight infants [1].

4.4. Clinical and Paraclinical Data

The high prevalence of neonatal infections (36.75%) in our series is also a cause for concern. These infections are known to be one of the leading causes of neonatal mortality in LBW, especially in the context of prematurity [5] [14]. The high proportion of newborns with a white blood cell count >25,000/mm^3 and positive CRP testifies to the immune vulnerability of these children. This highlights the need to reinforce hygiene practices, early detection and rapid management of infections, as recommended by WHO standards [14].

With regard to the care provided, breastfeeding (93.59%) and the use of kangaroo mother care (70.94%) are positive practices, although they are still insufficiently optimized. These results show the involvement of nursing staff in promoting breastfeeding and the mothers' adherence to this practice. Furthermore, it is recognized that exclusive breastfeeding and SMK play a crucial role in reducing neonatal mortality, improving thermoregulation, growth and mother-infant attachment [7] [8] [15]. Phototherapy and oxygen therapy were used in 20.52% and

22.22% of cases respectively. These figures illustrate the frequency of complications such as neonatal jaundice (20.52%) and respiratory distress (11.97%), which are common in premature babies, particularly those of very low birth weight [16] [17].

Despite these good practices, the case fatality rate in our study remains high (37.61%), higher than that reported by Adetola *et al.* in Nigeria and Getoneh *et al.* in Ethiopia [15] [16]. This rate could be explained by the delay in initiating care, the lack of equipment, the multiple complications, but also by the very low weight on admission (average weight of 1607 g, with cases at 800 g). It also emerges that in the centers studied, access to functional incubators, oxygen concentrators, or neonatal ventilation is limited. This technical deficit reduces the ability to adequately manage major LBW complications such as respiratory distress syndrome or hypothermia [18]. Additionally, the lack of neonatal monitoring (pulse oximeters, closed incubators with thermal and humidity regulation) also hinders early detection and treatment of signs of decompensation. Studies have shown that introducing simple yet effective equipment, such as neonatal resuscitation bags and low-cost CPAP devices, can significantly improve LBW infant survival [19]. The survival of very low-weight newborns is highly dependent on available resources and access to specialist care, as confirmed by several studies [14] [16]. Furthermore, the absence of systematic recording of vital signs and the lack of neonatology-trained personnel worsen the impact of under-equipment. In low-tech settings, healthcare workers are often forced to improvise suboptimal solutions. It is therefore imperative that health policies integrate not only staff training but also the provision of equipment suited to local conditions. Strategies such as the WHO's "Every Newborn Action Plan" recommend strengthening the technological capacity of peripheral health facilities to improve LBW care [20]. In addition, the weight growth observed at discharge (59.52 g/kg) is encouraging, particularly in the case of almost 47.5% of hypotrophic babies who achieved a gain of more than 15 g/kg/day. This growth is consistent with the recommendations for postnatal monitoring of very low birth weight babies, which stipulate that good weight gain is a positive indicator of recovery [16].

5. Conclusions

The birth of low-birth-weight babies poses a significant concern for mothers, their families, and medical staff due to the high prevalence and adverse consequences involved. This study highlights a concerning prevalence of low birth weight (LBW) newborns in the referral hospitals of Kara in 2023, with a rate of 22.14%, predominantly among preterm infants. The frequent occurrence of neonatal complications (particularly infections, jaundice, and respiratory distress) and a high mortality rate of 36.26% underscore the significant challenges in managing this vulnerable population.

Despite commendable efforts such as promoting breastfeeding and implementing Kangaroo Mother Care (KMC), outcomes remain suboptimal, with favorable

evolution observed in just over half of the cases. These findings point to the need for strengthening the technical and human capacities of neonatal care units, standardizing management protocols, and ensuring systematic monitoring of care quality indicators.

Moreover, upstream interventions are essential. These include enhancing the quality and accessibility of antenatal care, early identification of high-risk pregnancies, and raising maternal awareness on nutritional and health practices during pregnancy. A comprehensive and integrated approach is crucial to improving neonatal outcomes and achieving the Sustainable Development Goals (SDGs) related to neonatal mortality reduction.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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