


Research Article

Epidemio-Clinical Profile of Newborns Transferred to University Clinics of Kinshasa and Poor Prognosis Factors

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Abstract

Introduction: Neonatal mortality remains high in our environment and several factors contribute to this increase, notably transfer conditions. The objective was to study the conditions of transfer of newborns in Kinshasa in order to reveal the inadequacies and thus assess their impact on neonatal morbidity and mortality.

Method: This is a cross-sectional and analytical study which took place from April 1, 2022 to March 31, 2023 in the neonatology department of the University Clinics of Kinshasa (CUK) having included all newborns referred by a health structure.

Results: Of 180 newborns enrolled in this study, 46.1% were transferred the same day of birth, the most used means of transport was the motorcycle taxi (32.2%). The main reasons for transfer were prematurity (22.2%), respiratory distress (19.4%) and congenital malformations (17.2). The majority of newborns (91.1%) were accompanied by single parents. On admission, 40.6% of newborns had respiratory distress; 38.3% had presented desaturation; hypothermia was found in 17.8%. The lethality was 46.7%. The factors associated with mortality were age greater than 7 days at the time of transfer, use of a motorcycle taxi, extreme prematurity, congenital malformations, respiratory distress requiring emergency resuscitation.

Conclusion: Transfers of newborns take place in poor conditions in our environment, which contributes to the increase in neonatal morbidity and mortality. Improving the transfer system will contribute to reducing this mortality.

Keywords: Newborn; Transfer; Mortality; Kinshasa

Introduction

The neonatal period is characterized by a certain fragility, so that the boundary between benign and severe morbid states is not clear, thus a banal condition can quickly become complicated and lead to death [1]; hence the need for recognition and early identification of danger signs in order to guide appropriate care [2].

Worldwide, more than 4 million children under one month die each year, approximately 40% of them during the first week of life [3,4]. Neonatal mortality remains high in sub-Saharan Africa compared to the rest of the world [5]; In the Democratic Republic of Congo (DRC), it was estimated at 28 per thousand live births according to the report of the Demographic and

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Health Survey (EDS) of 2013 – 2014 [6]. The main causes of neonatal mortality are represented in the DRC as throughout the world by complications of prematurity, perpartal asphyxia and infections [3]. These different situations of neonatal distress very often require a transfer from birthing structures that are often poorly equipped with qualified personnel and suitable technical platforms to reference neonatology services [4].

The transfer constitutes a moment of great instability for the newborn; it leads to stimulation with increased stress that can aggravate the precarious state of the newborn [7]. Due to the non-existence of an organized transport system for newborns in the city province of Kinshasa, most of these referrals are made in inadequate conditions, without respecting the basic rules of a medical transfer which can thus increase the risk of neonatal morbidity and mortality.

The objective of this work was to evaluate the conditions of transfer of newborns in Kinshasa in order to reveal the inadequacies and thus assess their impact on neonatal morbidity and mortality.

Methods

The study is transversal and analytical carried out over a period of twelve months going from April 1, 2022 to March 31, 2023. It targets all newborns transferred from the different health facilities in Kinshasa to the neonatology department of the University Clinics of Kinshasa during the study period. Any newborn transferred from a health facility in Kinshasa to the neonatology department of the University Clinics of Kinshasa and having been taken care of until discharge, whatever the outcome, was included in our study. Any newborn transferred but with missing information was excluded from the study. The selection of cases was done systematically (exhaustively).

For each newborn recruited, we collected information relating to sociodemographic aspects (term of birth and postnatal age of the newborn, sex, age of the mother, parity, marital status, level of education); information on the transfer (the reason for transfer, the means of transport, the accompanying person, the number of hospitals visited before admission to the CUK, the duration of the transfer); the condition of the newborn on arrival; the treatment received and the progress.

Data analysis was carried out with SPSS 21 software, the value of $p < 0.05$ was considered statistically significant.

Results

During the study period, 356 newborns were admitted to the neonatology department of the University Clinics of Kinshasa; among them, 180 were transferred from a health structure, i.e. a frequency of 50.6%.

Characteristics of Mothers of Newborns

The majority of mothers were aged between 20 and 29 years (52.8%), married were predominant (57.7%), the majority were primiparous (41.1%) and had a secondary education level (53.9%).

Characteristics of Newborns

Sex, Term of Birth and Post-Natal Age of Newborns

The male gender was predominant with 57.6% of cases, term newborns represented 70.7% and premature babies 27.7% as presented in Table 1. The majority of newborns were less than 24 hours old upon their admission to the CUK and 8.9% were more than 7 days old.

Data on Newborn Transfer

The majority of newborns were transferred using a handwritten letter (96.7%), the most used means of transport was motorcycle taxi (32.2%) followed by private taxi (23.9%). There was no recourse to a medical ambulance, prematurity was the most common reason for transfer with 27.7% of cases, followed by respiratory distress (19.4%) and congenital malformations (17.6%). The majority were accompanied by single parents, i.e. 91.1% (Table 2).

Clinical Table of Newborns on Arrival at CUK

Table 3 shows the clinical picture of newborns on admission to the CUK. On admission to CUK, 17.2% of newborns had hypothermia; 52.8% were lethargic; 32.8% were tachycardic; 40.6% were polypneic; 61.7% had feeding difficulty and 12.2% had pallor.

Therapeutic management of newborns on admission to CUK

Therapeutic management of newborns upon their admission to the CUK is shown in Table 4. It consisted of a glucose infusion in 96.1%; antibiotic therapy in 91.1%;

Table 1: Distribution of newborns by age, sex and term.

		Effective	%
Sex	Male	102	56,7
	Female	78	43,3
Term	Full-term Newborn	127	70,6
	Premature	50	27,7
	Post term	3	1,7
Postnatal Age	< 24Hrs	83	46,1
Term	24 – 48Hrs	38	21,1
	> 48H à 7days	43	23,9
	>7 days	16	8,9

Table 2: Distribution of newborns according to transfer data.

		Effective	%
Document	Letter	174	96,7
	Obst. Neonatal file	1	0,6
	None	5	2,7
Means of transport	Motorbike	58	32,2
	Private taxi	43	23,9
	Public transport	37	20,6
	Personal transport	30	16,7
	Non-medical ambulance	13	7,2
	Medical ambulance	0	0
	Reason for transfer	Prematurity	50
	Breathing distress	35	19,4
	Malformation	32	17,6
	Digestive trouble	20	11
	Jaundice	20	11
	Fever	10	5,5
	Neurological distress	9	5
	Hemorrhagic Syndrome	5	2,8
Accompanying	Single Parents	164	91,1
	Nurse	14	7,8
	Doctor	2	1,1
Duration of journey	<1H	33	18
	1H – 2H Excluded	115	64
	2H – 3 H Excluded	25	14
	3 H - ≥ 24 H	8	4
Number of structures visited	1	113	62,8
	2	54	30
	3	13	7,2

Table 3: Distribution of newborns according to the clinical table on arrival.

		Effective	%
Thermoregulation	Hypothermia	32	17,8
Neurological	Fever	32	17,8
	Lethargy	95	52,8
Cardiovascular		16	8,9
	Coma	3	1,7
	Tachycardia	59	32,8
	Bradycardia	21	11,7
	Cardiac arrest	1	0,6
Respiratory	Collapse	2	1,1
	Polypnea	73	40,6
	Bradypnea	15	8,3
	Respiratory arrest	5	2,8
	Signs of struggle	57	31,7
Digestive	Desaturation	69	38,3
	Eating difficulty	111	61,7
	Vomiting	13	7,2
	Abdominal distension	13	7,2
Skin Coloring	Digestive hemorrhage	6	3,3
	Jaundice	32	17,8
	Pallor	22	12,2
	Cyanosis	18	10
	Marbled	5	2,8

Table 4: Distribution of Newborns According to Care on Arrival.

	Effective	%
Oxygen	65	35
Resuscitation	19	10,6
Fight against hypothermia	36	20
Antipyretic	32	17,8
Antiseizure	16	8,9
Glucose infusion	173	96,1
Antibiotic	164	91,1
Adrenaline	10	5,6
Caffeine	20	11,1
Phototherapy	23	44,4
Transfusion	4	2,2
Wet bandage	17	9,4
Laparotomy	3	1,7

Table 5: Factors associated with mortality.

Variable	Death	Survival	P	OR (IC à 95%)
	n=84	n=96		
Age > 7 jours	12 (14,3)	4 (4,2)	0,017	3,833 (1,186 – 12,386)
Transfer by motorbike	47(56,0)	11(11,5)	0,000	9,816(4,583-21,024)
Extremely premature	10(11,9)	0(0,0)	0,002	3(1,852-4,860)
Congenital malformation	26(31,0)	6(6,3)	0,000	6,724(2,608-17,335)
Hypothermia	30(35,7)	2(2,1)	0,000	26,111(6,004-113,554)
Tachycardia	41(48,8)	18(18,8)	0,000	4,132(2,119-8,055)
Bradycardia	17(20,2)	4(4,2)	0,001	5,836(1,878-18,134)
Polypnea	45(53,6)	28(29,2)	0,001	2,802(1,516-5,180)
Bradypnea	12(14,3)	3(3,1)	0,007	5,167(1,405-18,496)
Signs of struggle	37(44,0)	20(20,8)	0,000	5,320(2,760-10,255)
Desaturation	49(58,3)	20(20,8)	0,000	5,320(2,760-10,255)
Pallor	19(22,6)	3(3,1)	0,000	9,062(2,575-31,880)
Disturbed neurological examination	78(92,9)	73(76)	0,02	4,096(1,579-10,628)
Need to resuscitate on arrival	16(19,0)	3(3,1)	0,001	7,299(2,044-26,023)

oxygen therapy in 35% of cases; measures to combat hypothermia in 20% of cases and 10.6% of newborns were resuscitated upon admission to clinics.

Factors associated with Mortality of transferred newborns

The mortality of transferred newborns was high with 46.7% of cases or 84 deaths. Table 5 summarizes factors associated with mortality of transferred newborns. These factors included age greater than 7 days at the time of transfer, transport by motorcycle taxi, extreme prematurity, congenital malformations, hypothermia, need for resuscitation at birth.

Discussion

The results of our study allowed us to identify the numerous gaps in the newborn transfer system in Kinshasa; these gaps can be explained by the lack of organization around neonatal transfer.

The majority of newborns transferred (52.8%) were from mothers aged between 20 and 29 ; in the Senegalese series, 57% of newborns came from mothers aged between 20 and less than 30 years [8] ; 53.9% of mothers had a secondary level of education while in the Malian study, almost 80% of mothers had a low level of education [9]. Parental education affects newborn health because neonatal mortality is highest in countries with low maternal education [3].

Regarding the age of newborns at the time of transfer, we found that 46.1% were transferred on the day of birth while 8.9% were transferred after 7 days of life, the male gender was predominant with 56.7% ; the majority of newborns were full term with 70.6% and there were 24.4% premature babies. The term was evaluated using morphological criteria according to FINNSTROM because in our settings, mothers generally do not know the date of the last period and rarely does early ultrasounds. In Senegal, Faye et al. [8] found a male predominance and 52.3% were transferred before 48 hours of life [8]. Late transfer may be linked to the failure to recognize danger signs (respiratory distress, neurological distress, etc.) by healthcare providers at the peripheral level and thus increase the risk of newborn deaths [2].

Regarding the transfer of newborns, the reasons for transfer found in our study were prematurity (22.2%), respiratory distress (19.4%) and congenital malformations (17.2%). Prematurity was the most common reason for transfer also found in other studies, notably in Mali by Dicko Traoré F et al. [9] with 33.6%. In Senegal, PM Faye et al. [8] reported that respiratory distress was the second reason for transfer with 33.8% after neonatal infection. Due to the lack of an adequate transfer system in our environment, the transfer of premature newborns is very delicate due to the risk of hypothermia and hypoglycemia that these premature babies run [10,11]. We should therefore encourage the in

utero transfer of these premature newborns in order to care for them immediately after birth with a view to minimizing the risks relating to movement which is not always done under optimal conditions in our low-income countries [12]. In no case was a medical ambulance used as a means of transport; the motorcycle taxi was the most used means (32.2%); our results are close to those of Senegal where the urban taxi was used in 45.1%. For Katamea et al. [13] in Lubumbashi (DRC), public transport was used in 26.7%. In Mali and India, a non-medical ambulance was used in 17.4% and 29% respectively [9,14]. These non-medical transfers would explain the high rate of hypothermia on arrival because in most cases newborns are not well covered and considerably reduce the chances of survival of newborns [15].

The majority of newborns were accompanied by their parents alone (91.1%); the same observation was made in Senegal (72.3%). The support rate was low in Mali (17.4%) and India (15%) [9,14]. In Brazil, Araujo BF et al. [10] found that 33% of transfers were accompanied by a pediatrician [10]. The absence of support means the absence of care during the transfer, which contributes to the worsening of the clinical condition of newborns [16].

The sometimes high number of health facilities visited before landing at CUK can be explained on the one hand by the absence of a regulatory body between health facilities, the limited number of neonatology services in the city and on the other hand by the restriction of certain neonatology services to receive children born outside their maternity ward.

The clinical condition of newborns on arrival was often very worrying due to the lack of care during the transfer; 52.8% of newborns were lethargic, 38.9% had desaturation and 17.8% of newborns were hypothermic. Hypothermia was reported in almost all newborns in the study by Dicko Traoré F et al. [9] in Mali, in 47% of newborns in India by Narang M et al. [14] and in 38% of newborns in Senegal (8,9,14) ; this is justified by the unsuitable transfer conditions with the use of public transport.

Of the 180 newborns transferred in our series, 84 died, representing a mortality of 46.7%. This rate is higher than the rates reported by some African authors. Indeed, Katamea et al. [13], Faye et al. [8], Dicko Traoré et al. [9] respectively reported a rate of 27% in Lubumbashi (DRC), 22.3% in Senegal and 32% in Mali [8,9,13].

The factors associated with mortality were age greater than 7 days at the time of transfer, use of a motorcycle taxi as a means of transport, extreme prematurity, congenital malformations, respiratory distress, disturbed neurological examination, hypothermia and the need for resuscitation on admission. Some of these factors have been found by certain authors, notably in Senegal (hypothermia, respiratory distress, neurological distress, low gestational age); in Lubumbashi in the DRC (prematurity); in Mali (use of public

transport). Transfer by public transport does not respect any principle of medical transfer, which exposes newborns, especially premature ones, to hypothermia [17]; hypothermia leads to intracranial hemorrhage but also to the worsening of the clinical condition of the newborn, which increases the probability of death [18-20].

Conclusion

The transfer of newborns takes place in precarious conditions in our environment, which contributes to the increase in neonatal morbidity and mortality. Better organization of perinatal care and improvement of the transfer system will contribute to the reduction of neonatal mortality in our settings.

Acknowledgments

Authors Contribution:

Thérèse BISELELE BAKABUMVUA: conceived and directed the work. Onésime KAMOLO MBAKALANGA: Collected the data and wrote the work. Francine MASSAY: contributed to the development of the work protocol.

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Conflicts of interest:

The authors declare that they have no conflicts of interest.

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