

PROFILE OF MORBIDITY AND MORTALITY IN AT-RISK NEWBORNS

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ABSTRACT: This descriptive study analyzed the profile of morbidity and mortality in the first six months of life among at-risk neonates in Cuiabá in the state of Mato Grosso, in January 2011. The data sources were the Certificate of Live Birth and home interviews held six months after the birth. The study was approved by the Research Ethics Committee and the families signed the Terms of Free and Informed Consent. 113 newborns were studied, of whom 70.8% presented morbidity in the first six months of life, mainly involving respiratory and diarrheal diseases; morbidity was greater among newborns whose mothers did not work outside the home, who were adolescents, or who breast-fed for little time; 5.3% of the children died, of whom 83.3% died in the neonatal period; the deaths occurred more among newborns with low birth weights, or who were premature, or whose mothers did not work outside the home. It is hoped that the results may support specific policies for care to the group composed of live at-risk newborns.

DESCRIPTORS: Newborn; Risk groups; Child morbidity; Child mortality.

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INTRODUCTION

The indicators for morbidity and mortality among children are fundamental for evaluating the quality of mother and child health care, as well as for the promotion of the population's health and for the prevention of diseases⁽¹⁻²⁾. In this regard, Brazil has progressed in reducing child mortality, most significantly through the reduction of post-neonatal mortality (27 to 364 days of life)⁽³⁻⁴⁾. This fact is attributed to low-cost, highly efficacious actions such as, for example, the use of Oral Rehydration Therapy (in particular, in cases of diarrhea), control of acute respiratory infections, encouragement of breastfeeding, improvements in sanitation, increase in vaccine coverage, and expansion of the basic health services, among others⁽⁵⁾.

Even so, the rates of child mortality are high in Brazil, principally in the first days of life (0 to 27 days of life), which causes neonates to deserve special attention, principally those born in conditions considered 'at risk'^(4,6).

The Ministry of Health classifies a newborn as being at-risk if at least one of the following criteria apply to it: low birth weight (less than 2,500 g); a gestational age below 37 weeks; serious asphyxia (an Apgar score below seven at the 5th minute of life); if the mother is an adolescent (below 18 years old); if the newborn is hospitalized or if a complication occurs involving the newborn in the maternity unit or neonatal care unit; if there is a need for special guidance upon discharge from the maternity unit; if the newborn's mother received less than 8 years of education; and if the child lives in an area considered to be of risk or if there is a history of the death of a child aged under five years old in the family⁽⁴⁾.

Besides mortality, it is of fundamental importance also to analyze the determinants of morbidity in this group, as the early recognition and prevention of diseases contribute to reducing deaths. In this regard, the epidemiological profile indicates that the respiratory illnesses are the main reason for consultations in child outpatient and emergency services, pneumonia and diarrhea being the principal illnesses in children under one year old⁽⁴⁾. It is worth emphasizing that premature newborns are more vulnerable to developing morbidities than full-term newborns⁽⁷⁻⁸⁾. Authors also point to the socio-economic conditions, such as low levels of family income and maternal education, as factors directly related to child health conditions⁽⁹⁾.

Recognizing these indicators' importance, principally among at-risk newborns, the present study aimed

to analyze the morbidity and mortality profile, in the first six months of life, of the at-risk newborns born in the city of Cuiabá in the Brazilian state of Mato Grosso.

METHOD

The population of this descriptive, quantitative study was made up of at-risk neonates born in Cuiabá in the State of Mato Grosso (MT), in January 2011. The first data source was the Certificate of Live Birth, used to identify and include the newborns in the research, in accordance with the classification criteria defined by the Ministry of Health for at-risk newborns. Out of the total of births in January 2011 (1,107), 113 at-risk newborns who met the inclusion criteria were selected.

Six months after the child was born, a survey was undertaken using a closed instrument, the mothers being invited to participate in the research, signing the Terms of Free and Informed Consent.

In the interview, which took place in the participant's home, the following variables were collected: the newborn's birth weight and sex; maternal obstetric history (number of prenatal check-ups, duration of the pregnancy of the newborn under study); history of morbidity (occurrence of illnesses until the sixth month of life, which illnesses, whether inpatient treatment was necessary because of illness and length of hospitalization); and mortality of the newborn (occurrence of death in the first six months of life, whether the family sought the health service up to 24 hours prior to the death, if the newborn was hospitalized before death, the length of hospitalization before death, the place, age, and cause of death, based on the ICD-10 code found in the Death Certificate); with whom the newborn lived; the mother's variables (occupation, education, age); monitoring of growth and development by the Health Center (whether undertaken or not); the child's vaccine situation (whether the child was up-to-date or behind); the frequency with which the mother sought the health service (sporadically, monthly, fortnightly, weekly, does not seek it, does not know); and duration of exclusive breastfeeding for the newborn under study.

The data were analyzed using the EpiInfo program, version 3.5.2., and the Chi-squared test was applied, considering the value of $p < 0.05$ for statistically significant association.

The study is part of the research project "evaluation of care for the child in the Primary Care Network of Cuiabá – Mato Grosso (MT), with the emphasis on its organization and care, and on the nursing practices",

approved by the Research Ethics Committee of the Júlio Muller University Hospital, of the Federal University of Mato Grosso, under Protocol 882/CEP-HUJM/2010.

RESULTS

Of the 113 at-risk newborns researched, 70.8% had had an illness by six months of age, with the respiratory illnesses (43.3%) (flu, inflammation of the throat, bronchitis, bronchiolitis, infection of the respiratory tract, and colds) and diarrheal illnesses with 29.2% (Table 1) standing out. Among those who presented a morbidity, 12.5%(10) needed inpatient treatment. Among these, 60.0%(6) needed to remain in the hospital for between 1 and 3 days, 30%(3) for 10 days or over, and 10%(1) were hospitalized for between 4 and 6 days.

Associations were sought between morbidity up to 6 months of age and the mother's occupational situation, educational level and age, with whom the child lived, monitoring of growth and development, immunization, the frequency with which the mother sought attendance in the Primary Care Center (UBS) and breastfeeding. The highest percentage of morbidity occurred among children whose mothers were not in the job market (73.8%), followed by those whose mothers work informally (16.3%) and formally (7.5%) ($p=0.4987$).

It was the children who lived with the father and the mother who presented the highest percentage of illnesses up to 6 months of age (56.3%), followed by those who lived with the mother (28.8%), with other persons (11.3%), a relative (2.5%), and with the mother and the stepfather (1.3%) ($p=0.0000$).

Morbidity among the children increased in line with the educational level of the mother, with a higher percentage of ill children among the mothers with 8 to 11 years of education (52.5%), followed by those with 4 to 7 years of education (43.8%), 1 to 3 years (2.5%) and length of study unknown (1.3%) ($p=0.9381$). There was a higher percentage of morbidity among the children whose mothers were aged below 18 years old (41.3%), followed by the mothers aged from 18 to 27 years old (31.3%), 28 to 37 years old (25.0%) and 38 to 47 years old (2.5%) ($p=0.3159$).

Children who are monitored in the UBS, as in other institutions, presented high percentages of morbidity (74.7% and 71.4% respectively) ($p=0.0000$). The majority of the children, both those who became ill and those who did not, were up to date with immunization (63.8% and 64.3% respectively) ($p=0.0000$). The highest proportion of children who became ill occurred among

those whose mothers sought attendance in the health service sporadically (38.8%), followed by those who sought it monthly (32.5%), who did not seek it (21.3%), who sought it fortnightly (2.5%), weekly (1.3%) and with an unknown frequency (3.6%) ($p=0.0000$).

The percentage of morbidity was shown to reduce in proportion to the increase in months of exclusive breastfeeding (Table 2). Among those who received exclusive breastfeeding up to 6 months of age, morbidity reduced significantly to 2.5% ($p=0.0000$).

Of the study population, 5.3%(6) died, 83.3%(5) in the neonatal period and 16.7% (1) in the post-neonatal period. Of these, 66.7%(4) were male ($p=0.5339$). 33.3%(2) of the responsible persons did not seek the health service until 24 hours prior to the death and 66.6%(4) of the newborns (NB) were not discharged after their birth, with the deaths occurring in the hospital. In relation to the causes of death, 50.0%(3) of the mothers did not state what it was and did not have the Death Certificate with them at the time of the home interview; 16.7%(1) occurred due to anencephaly; 16.7%(1) due to septicemia and Down's Syndrome; and 16.7%(1) due to septicemia, acute respiratory failure and prematurity.

Associations were sought between the death of the NB up to six months of age and: mother's occupational situation, educational level and age; the number of prenatal check-ups; and the NB's gestational age, birth weight and sex. The highest percentage of deaths occurred among those children whose mothers were not in the job market (50%), followed by those whose mothers worked informally (33.3%) and formally (16.7%) ($p=0.5553$). Among the children who died, 50% of the mothers had between 4 and 7 years of study, and 50% between eight and 11 years of study ($p=0.9731$).

Among the newborns who died, 50% were the children of mothers aged between 28 and 37 years old; 33.3%, of mothers aged between 18 and 27 years old; and 16.7% of mothers younger than 18 years old ($p=0.5128$). The highest percentage of deaths occurred among the mothers who had six or more pre-natal check-ups (50%), followed by those who had less than six check-ups (33.3%). In the case of 16.7%, it was not possible to find out the number of prenatal check-ups ($p=0.3648$). Premature babies had the highest percentage of death (66.7%) ($p=0.0603$) (Table 3).

The lower the birth weight, the higher the percentage of death among 66.7% who were born weighing less than 2,500 g and 33.3% weighing between 2,500 g and 3,500 g (Table 4) ($p=0.0142$).

Table 1 – Distribution of at-risk neonates, born in January 2011, by morbidity up to 6 months of age. Cuiabá-MT-Brazil, 2011

Illnesses up to six months of age	Yes		no		Could not say		Total	
	n	%	n	%	n	%	n	%
Respiratory illnesses	49	43,3	59	52,2	5	4,4	113	100
Diarrheal disease	33	29,2	75	66,3	5	4,4	113	100
Conjunctivitis	13	11,5	95	84,0	5	4,4	113	100
Pneumonia	12	10,6	96	84,9	5	4,4	113	100
Anemia	11	9,7	97	85,8	5	4,4	113	100
Jaundice	11	9,7	97	85,8	5	4,4	113	100
Infectious/contagious illnesses	7	6,1	101	89,3	5	4,4	113	100
Allergy	3	2,6	110	97,3	-	-	113	100
Malnutrition	2	1,7	106	93,8	5	4,4	113	100
Dehydration	2	1,7	106	93,8	5	4,4	113	100
Otitis	2	1,7	111	98,2	-	-	113	100
Measles	1	0,8	112	99,1	-	-	113	100
Chickenpox	1	0,8	112	99,1	-	-	113	100
Gastric reflux	1	0,8	102	90,2	-	-	113	100
Others	1	0,8	102	90,2	-	-	113	100

Table 2 - Distribution of at-risk neonates, born in January 2011, by prevalence of breastfeeding and the incidence of illnesses up to six months of age. Cuiabá-MT-Brazil, 2011

Age to which child received exclusive breastfeeding	Occurrence of illnesses in the first six months of life			
	Yes		No	
	n	%	n	%
Not exclusively breastfed	20	25,0	4	14,3
Less than 15 days	16	20,0	2	7,1
15 to 29 days	2	2,5	-	-
1 month	13	16,3	-	-
2 months	8	10,0	4	14,3
3 months	8	10,0	7	25,0
4 months	7	8,8	5	17,9
5 months	3	3,8	2	7,1
6 months	2	2,5	4	14,3
Unknown	1	1,3	5	-
Total	80	100	33	100

Table 3 - Distribution of at-risk neonates, born in January 2011, by gestational age and mortality up to 6 months of age. Cuiabá-MT-Brazil, 2011

Gestational age	Death			
	Yes		no	
	n	%	n	%
< 37 weeks	4	66,7	28	26,2
37 to 42 weeks	-	-	59	55,1
42 weeks and over	-	-	1	0,9
Unknown	2	33,3	19	17,8
Total	6	100	107	100

Table 4 - Distribution of at-risk neonates, born in January 2011, by birth weight and mortality up to 6 months of age. Cuiabá-MT-Brazil, 2011

Birth weight	Death			
	Yes		No	
	n	%	n	%
< 2.500g	4	66,7	16	15,0
2.500 a 3.500g	2	33,3	77	72,0
> 3.500g	-	-	13	12,1
Unknown	-	-	1	0,9
Total	6	100	107	100

DISCUSSION

Studies indicate the occurrence of many respiratory illnesses in children up to one year of age⁽¹⁰⁾, this representing 36.23% of inpatient treatment in hospital under the Unified Health System in Brazil⁽¹¹⁾. The occurrence of diarrheal disease also corroborates research, in which this health issue was the second most common cause of child death in the ages from 4 to 9 months⁽¹²⁾. Considering that respiratory and diarrheal illnesses continue to be serious problems for child health, sectorial actions which aim for general life improvements – with emphasis on employment and income, sanitation^(4,9). And urban cleanliness, as well as paving roads and care with the environment – become essential, so as to minimize the occurrence of respiratory illnesses at times in which air humidity is low.

It is worth emphasizing the importance of the primary care centers in undertaking the appropriate diagnosis and treatment, so as to avoid hospitalizations and deaths. This is the objective of the current health policies directed at children, such as the Integrated Management of Childhood Illness⁽¹³⁾ strategy. Set up in order to alter the profile of child morbidity and mortality in Brazil, this strategy is characterized by recommended conducts relating to publicising, preventing and treating the more frequent childhood problems, such as those related to breastfeeding, healthy food, growth and development and immunization, thus keeping under control the health threats which are more common in childhood, such as malnutrition, the diarrheal diseases, acute respiratory infections and malaria⁽¹³⁾.

Attention is drawn to the fact that, among the children who became ill, the majority of the mothers were not working and were aged under 18 years old, data which give rise to two reflections: firstly, that the simple presence of the mother at home, due to not

working elsewhere, does not avoid the occurrence of illnesses for the child. In this regard, improvement in socio-economic and general living conditions, such as education and access to health services with resolute capacity, stands out as essential. The second reflection is that it is necessary for there to be more specific monitoring of health for the mother-child binomial when the mother is an adolescent, as immaturity and lack of experience are determinant factors for the care of the child^(9,14).

Although the children's growth and development was monitored in the health centers, this, on its own, did not avoid the episodes of illness, which may be related to the inadequacy of the biomedical model of health care. This fact, allied with the sporadic frequency with which the mother sought the health service for attending the child, calls attention to the need for more frequent monitoring by the primary care services, because the children are considered to be at-risk at birth. One possibility for attaining excellence is monitoring by the Family Health Strategy, set up in 1994 to provide comprehensive, good quality and continuous care with resolute capacity, in the health center and home alike⁽¹⁵⁾, in particular when dealing with at-risk newborns.

A longer period of exclusive breastfeeding as a protective factor for reducing morbidity in childhood is corroborated by the literature, as consistent evidence suggests that the practice of breastfeeding, above all if exclusive, protects the newborn against diseases such as diarrhoea, gastrointestinal infections, and other symptoms of child morbidity, providing a series of other benefits to the child's health, both in the short and long term⁽¹⁶⁾.

The occurrence of deaths in the early neonatal and postnatal period matches the tendency of child mortality in Brazil. A study undertaken in Fortaleza in the State of Ceará ascertained that of the neonatal

deaths in 2009, 79.5% occurred in the early neonatal period⁽¹⁷⁾. In Cuiabá, State of Mato Grosso, in 2010, 77 neonatal deaths occurred, of which 72.8% occurred in the early neonatal period⁽¹⁸⁾.

Authors indicate that early neonatal mortality is associated principally with shortcomings in the care given to the pregnant woman during the prenatal period and the birth, as well as the lack of appropriate care for the newborns at the time of birth in neonatal intensive care units⁽¹⁷⁾. Child mortality, as it constitutes a serious public health problem, requires investments in the general improvement of the population's conditions of life including the restructuring of the care given to the pregnant woman and newborn, with articulation between the primary care services and those providing care in relation to birth; ensuring equal access to the quality of the prenatal care and the birth process, the birth, and hospitalization of the newborn⁽¹⁹⁾.

Although no association was found between the number of prenatal check-ups and deaths, authors emphasise that not doing the prenatal check-ups increases the risk of the occurrence of fetal losses, infant deaths and low birth weights⁽²⁰⁻²²⁾. Thus, emphasis is placed on the importance of the quality of the care for the early identification of at-risk pregnant women⁽²³⁾.

Although the present study has not evidenced any association between a death in the first six months of life and maternal education, authors point to this variable's relationship with the child's survival, as this association may be related to the mothers' low socio-economic standard, and, through this, to the possibility of the newborn's low weight, due to the mothers initiating the prenatal care late, and presenting a lower weight gain during the pregnancy⁽²⁰⁾. In this regard, it is understood that social investments, such as in Brazil's educational structure, may contribute directly to improving health care.

In spite of the non-association between death of the newborn and a low maternal age, authors indicate that children of adolescents have a higher risk of death in the first year of life⁽²¹⁾. In the light of this, it is necessary for health professionals to build effective links with adolescent mothers, including the families of these young people, in the care, promoting dialog and contributing in order to strengthen family support. In this way, in spite of her young age, the mother will be able to feel more supported in the care for herself and for her newborn.

Low birth weight associated with death was also found in Fortaleza – Ceará; among newborns who died,

6.4% weighed < 2,500g⁽¹⁷⁾. Low birth weight, whether resulting from insufficient intrauterine growth, a lower gestational age, or a combination of both, is a determinant for neonatal, perinatal and child mortality, often being linked with socio-economic conditions^(9,22).

The study found no association between death up to 6 months of age and the newborn's sex. However, the literature shows that male newborns have twice the risk of dying compared to females. This is thought to be the result of the earlier maturing of the fetal lungs in females, with a consequent reduction in respiratory problems, one of the main causes of neonatal death⁽²²⁾.

CONCLUSIONS

This study analyzed the profile of morbidity and mortality in the first six months of life among at-risk newborns in Cuiabá – Mato Grosso, seeking possible associations between the occurrence of diseases and deaths and maternal and socio-economic variables. Attention is drawn to the fact that the illnesses which most affect the children can be treated at primary care level, where they can be diagnosed early and appropriately treated, avoiding the progression and worsening of the situation.

Preventing the main illnesses in the first years of life is a challenge, especially in population groups with limited socio-economic conditions. In this regard the results allow one to reflect upon the need for investments in the restructuring of the health care given to the pregnant woman and newborn, with articulation between the different levels of health care, ensuring access to, and quality of, the prenatal care, labor, birth and hospitalization of the newborn. In conjunction with these measures, increased and better investments in the general improvement of the population's life are shown to be essential, in order to effectively reduce the high rates of child morbidity and mortality in Brazil.

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