Mortality rates in children between birth and five years old in Uberlandia in the years of 2000, 2005, and 2009

Mortalidade de zero a cinco anos em Uberlândia nos anos de 2000, 2005 e 2009

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ABSTRACT

Introduction: the mortality rate in children between birth and five years old is an important social indicator that allows the development of various public policies. **Objectives:** to know and classify the deaths of children from birth to five years of age in Uberlândia, the main causes, and trends in mortality rates in the years of 2000, 2005, and 2009. Methods: data on deaths were collected in the Civil Registry Office of Uberlândia. The deaths were classified according to the following variables: age, gender, basic cause of death according to the CID-10 major chapters 1, origin, and month of death. **Results:** 476 deaths were reported in the cited years being 159 in 2000, 156 in 2005, and 161 in 2009. There was a predominance of mortality in the early neonatal age group (zero to six days), males, and causes of death related to diseases of the perinatal period (XVI chapter from the CID-10).[1] **Conclusions:** the mortality rate between birth and five years old, as well as that in infants (zero to one year old), was relatively stable, with a slight fall in the year of 2009. These mortality rates in Uberlândia are still lower than in most of the Brazilian States and in all five regions; they are also markedly inferior to those in the country in general.

Key words: Infant Mortality; Perinatal Mortality.

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RESUMO

Introdução: a mortalidade de crianças de zero a cinco anos é um importante indicador social e o conhecimento dessa taxa permite o desenvolvimento de diversas políticas públicas. Objetivos: conhecer e classificar as mortes de crianças de zero a cinco anos em Uberlândia, suas principais causas e a evolução das taxas de mortalidade nos anos de 2000, 2005 e 2009. Métodos: foram colhidos os dados relativos aos óbitos no Cartório de Registro Civil de Uberlândia, classificando as mortes de acordo com as seguintes variáveis: faixa etária, sexo, causa básica de morte conforme os grandes capítulos da CID-10,[1] procedência e mês em que ocorreu o óbito. Resultados: foram relatados 476 óbitos nos anos citados, sendo 159 em 2000, 156 em 2005 e 161 em 2009. Houve predomínio de mortalidade da faixa etária neonatal precoce (zero a seis dias), do sexo masculino e causas de morte relacionadas a afecções do período perinatal (capítulo XVI da CID-10).[1] Conclusões: a mortalidade de zero a cinco anos, assim como a infantil (zero a um ano), apresentou-se relativamente estável, com ligeira queda no ano de 2009, em Uberlândia. No entanto, os índices de mortalidade em Uberlândia ainda são mais baixos do que na maioria dos estados brasileiros e em todas as cinco regiões e muito inferior aos índices do país, de forma geral.

Palavras-chave: Mortalidade Infantil; Mortalidade Perinatal.

INTRODUCTION

The study of mortality of children from zero to five years old has great importance in the analysis of developmental indexes of a country because it widely express not only health-related parameters but also those of socioeconomic and infrastructure interests.[1]

Thus, indicators such as the infant mortality coefficient have great importance for regions and depend crucially on systematic information (annual) of good quality including the number of deaths and births.[1]

In Brazil, the numbers are still negative despite the improvement of infant mortality indicators in the recent years. Brazil currently occupies the 107th place in the ranking of mortality up to the age of five years old, with 22 deaths for every 1,000 children born alive.[2] Between 1980 and 2009, the Brazilian infant mortality reduced from 69.12 to 22.47 deaths per thousand live births,[3] which reflects important improvement, however, insufficient, because of the discrepancy in relation to developed countries. The majority of infant deaths is linked to preventable causes related to access and use of health services in addition to quality of prenatal, delivery, and newborn care,[4] which enhances the value of studies on infant mortality. These deaths have been treated as sentinel events for the quality of medical care and health systems given that the improvement in the possibility of intervention is increasingly focused on the performance of health services.[5]

A better understanding of the role of health care activities in the process of determining children's death is a necessity and an ethical commitment.[6] The coefficient of infant mortality is one of the most sensitive indicators for social transformations in any region. Thus, through this broad vision, this study aims to describe the historical evolution of mortality from zero to five years old in the city of Uberlandia, as well as its components (early neonatal, late neonatal, post-neonatal, and from one to five years old). To that extent, contributing to the debate about the transition processes in the mortality from zero to five years old, this study also aims to involve and sensitize health professionals and the civil society on the importance of identifying the circumstances in which these deaths occurred and thus promote measures to reduce this index. Their importance relates both to the design of intervention policies and monitoring, and as indicative of the effectiveness of health programs.

PATIENTS AND METHOD

The study population was formed by declared children deaths, aged from zero to five years old, in the municipality of Uberlândia-MG in the years 2000, 2005, and 2009. The total number of live births was obtained through a secondary source of information from the Live Births Information System (Sinasc)[7] and the information about deaths were obtained at the Civil Registry Office from Uberlândia by direct quantitative and qualitative evaluation of each declaration of death (DD).

The mortality coefficients from zero to five years old express the number of deaths per 1,000 children born alive within a specified interval of time. Declarations of death were divided into five groups according to ages: early neonatal, neonatal, post-neonatal or late infantile, and infant mortality. Besides the age factor, gender, the basic cause of death according to the CID-10,[1] origin, and the month of death were also considered.

This study was approved by the Committee of Ethics in Research with Humans from the Federal University of Uberlândia.

RESULTS

In Uberlandia, in 2000, the number of live births was 8,700 and the coefficients according to the age groups of early neonatal, neonatal, post-neonatal, and between one and five years old were 6.2; 2.7; 4.82; and 1.95, respectively for every thousand live births.[7] The coefficient of mortality for those less than five years old was 15.7, and the infant mortality rate was 13.7 per thousand live births. (Table 1).

The main cause of mortality is related to disorders originating in the perinatal period, chapter 16 of the CID-10.[1] Among the deaths caused by conditions originating in the perinatal period, 64.7% were recorded in the early neonatal period (Table 2).

In 2005, 8,650 were born alive in the city of Uberlandia.[7] The coefficients, according to the age groups of early neonatal, neonatal, post-neonatal, and between one and five years old were 8.21; 1.97; 3.7; and 1.97, respectively for every thousand live births. The mortality coefficient for those less than five years old was 15.84, and the infant mortality coefficient was 13.87 for each thousand live births.

In 2005, the highest number of deaths, 42.31%, refers to the grand chapter 16. Among the deaths by dis-

eases originating in the perinatal period, 80.3% were recorded in the early neonatal period.

Table 1 - Distribution of number of deaths according to age groups and grand chapters from CID-10 in Uberlãndia in 2000

Chapters/ Age groups	0-6 days	7-27 days	28 days- 1 year	1-5 years	Total
1	1	5	7	0	13
2	0	0	0	1	1
3	0	0	0	2	2
4	0	0	2	1	3
6	1	0	2	1	4
7	0	0	0	1	1
9	0	1	0	0	1
10	7	8	10	3	28
11	2	0	0	0	2
16	33	9	6	3	51
17	8	5	8	1	22
18	7	0	6	2	15
20	0	0	3	6	9
Total	59	28	48	23	158

Table 2 - Distribution of number of deaths according to age groups and grand chapters from CID-10 in Uberlãndia in 2005

Chapters/ Age groups	0-6 days	7-27 days	28 days- 1 year	1-5 years	Total
1	2	0	4	1	7
2	0	0	1	4	5
3	0	0	0	2	2
4	0	1	0	0	1
6	0	0	1	3	4
9	1	1	0	2	4
10	6	2	3	7	18
11	2	0	3	1	6
15	4	0	0	0	4
16	53	8	7	0	66
17	6	2	14	5	27
18	4	1	3	1	9
20	0	0	1	2	3
Total	75	18	37	26	156

In Uberlãndia, in 2009, the number of live births amounted to 8,391.[7] The coefficients, according to the age groups of early neonatal, neonatal, post-neonatal, and between one and five years old were 8.10; 1.91; 3.46; and 1.43, respectively for every thousand live births. The mortality coefficient for those less

than five years old was 14.9, and the infant mortality coefficient was 13.47 for every thousand live births.

Table 3 - Distribution of number of deaths according to age groups and grand chapters from CID-10 in Uberlãndia in 2009

Chapters/ Age groups	0-6 days	7-27 days	28 days- 1 year	1-5 years	Total
1	0	1	2	3	6
2	0	0	0	1	1
4	0	0	2	2	4
6	0	0	2	2	4
10	0	0	6	2	8
11	1	0	1	2	4
14	3	0	1	1	5
15	1	0	0	0	1
16	62	13	6	0	81
17	8	3	15	0	26
18	9	2	4	4	19
20	1	0	0	1	2
Total	85	19	39	18	161

It is observed that the main cause of mortality is related to disorders originating in the perinatal period, chapter 16 in CID-10.[1] In relation to deaths by conditions originating in the perinatal period, 76.54% were recorded in the early neonatal period (Table 4).

Table 4 - Distribution of number of deaths according to origins

Year/ Location	From Uberlãndia	From other localities	Total
2000	137	21	158
2005	137	19	156
2009	125	36	161

In 2000, among a total of 159 deaths, 13% came from other cities to die in Uberlãndia, and 87% were residents of the city itself. In 2005, out of the total of 156 registered deaths, 12.18% was from other localities and died in Uberlandia, as opposed to 87.82% residents from the city itself. In 2009, out of 161 recorded deaths, 22.4% came from other cities to die in Uberlãndia, and 77.6% were residents from the city itself.

DISCUSSION

The mortality rate from zero to five years old estimates the risk of death of live births before com-

pleting five years of life. It is an important indicator that reflects the social, environmental and political conditions of a certain region. According to data from SINASC[7], the coefficients of mortality under five years old reduced significantly between 2000 and 2009 throughout Brazil; in Minas Gerais, these numbers demonstrate that the rate of infant deaths in children less than one year old for every thousand live births fell from 17.55 in 2003, to 14.06 in 2009, which accounted for a 19.9% reduction.

In the context of Uberlândia, the coefficient of mortality in the age group from zero to five years old was lower than that for Brazil in 2000 and 2005. In 2000, the under-five years old mortality rate in Brazil was 32.0 and in Uberlândia 15.74. In 2005, the Brazilian coefficient declined to 25.4 and that from Uberlândia to 15.84. Such data indicate that the government from Uberlândia has been conducting a good investment in the area of health, sanitation, and quality of life for the population compared with many other localities in Brazil. These investments are held through prevention programs, both with regard to immunizations and support projects that, directly or indirectly, interfere in reducing mortality rates.
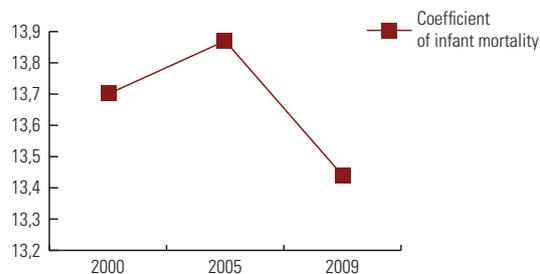

Figure 1 - Evolution of coefficients of infant mortality in Uberlândia in 2000, 2005, and 2009.

The study shows that there were no variations regarding the main causes of death in 2000, 2005, and 2009. Among them, disorders originating in the neonatal period, represented in chapter 16 of CID-10,[1] congenital malformations, deformities, and chromosomal abnormalities (chapter 17), and respiratory diseases (chapter 10) are observed. The first two are directly related to prenatal and maternal care of newborns. Studies highlight risk factors related to neonatal deaths such as lack of prenatal care, teenage mothers, and low birth weight.[8, 9] Therefore, in areas where the population receives proper assistance, from the prenatal period to childbirth and newborn care, the neonatal mortality is low. However, even in developed coun-

tries where neonatal mortality is very low, inevitable neonatal deaths occur, which, in general, are related to very serious and complex congenital anomalies and extreme prematurity. The goal of perinatal care is to make sure that every fetus who reaches maturity without malformation should survive. Currently, even the limits of viability have evolved, with an increased chance of survival of premature infants. Chapter 16, according to CID-10,[1] refers to disorders originating in the perinatal period and, in this regard, it was observed an increase in the number of deaths related to this fact in 2000, 2005, and 2009 (32%, 42.3%, and 50.3%, respectively). This reality clearly demonstrates the need for improvements in the quality of treatment, both for mothers prenatally and children in the neonatal period, in addition to increase in the number of Neonatal Intensive Care Units (NICUs) because over 65% of deaths occurred in the early neonatal stage every year.

Congenital malformations, deformations, and chromosomal abnormalities represented the second-leading cause of death from zero to five years old in Uberlandia in the studied years (13.8% in 2000, 17.3% in 2005, and 16.1% in 2009). It is observed that the deaths occurred mainly in children from zero to one-year-old (95.4%, 81.4%, and 100%, respectively in the studied years). This fact is understandable, since the vast majority of these disorders have complicated and serious outcomes, making it impossible for these children to live beyond one year of life for the vast majority. The improvement in pre- and perinatal care contributes to increased the prevalence of deaths caused by neonatal malformations because it decreases the number of deaths from preventable causes.

Mortality caused by congenital anomalies is little affected by socioeconomic conditions and technological advances. Two important points must be considered in the statistical analysis of mortality from congenital abnormalities: the first refers to countries where abortion is legalized and, consequently, there is interruption of pregnancies in most cases in which there is a prenatal diagnosis of congenital malformation decreasing the neonatal mortality coefficient;[10] and the second refers to insufficient diagnosis of early deaths leading to the false interpretation of low incidence of congenital anomalies.

Other causes of death had little expression in the data survey and remained practically constant in the analyzed years.

It also should be noted that there is a significant number of deaths by undetermined causes, being

9.4% in 2000, 5.8% in 2005, and 11.8% in 2009. Most of these cases are related to inadequate filling of death certificates by doctors, illegible handwriting, and use of acronyms that are unknown to professionals in the registries. Therefore, the need to alert doctors about this issue is observed in the light of the importance of these statistical data in the study of epidemiology and, consequently, in the improvement of health services.

The analysis of the evolution of the distribution of mortality in those less than five years old according to places of origin in the studied years, as shown in Figure 2, showed that the percentage of children who came and die in Uberlândia from other locations in 2009 (22%) is higher than that of previous years (13% in 2000 and 12.2% in 2005). This data shows that the number of children from other locations that are dying in the city is increasing, demonstrating the importance of the General Hospital from the Uberlândia University as a reference center for medium and high complexity medical issues. The Hospital provides care for a population of nearly three million people from 86 municipalities and attracts more people from all over the region with the expansion of its service.
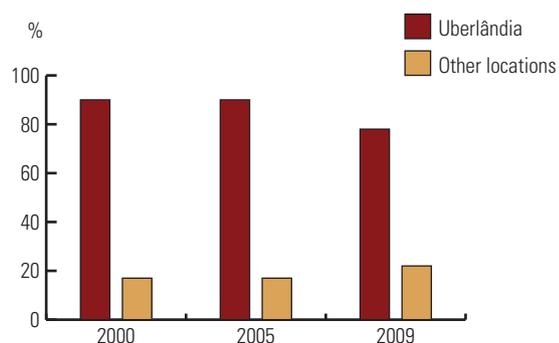

Figure 2 - Evolution of children's mortality distribution according to location of origin in 2000, 2005, and 2009.

CONCLUSION

It is concluded that the mortality rates in Uberlândia are smaller than most found in Brazilian states.

There was a relative stability of coefficients of mortality from zero to one-year-old and from zero to five years old in Uberlândia; the divisions by age group showed the same trend. The exception was in early neonatal mortality, which presented elevated coefficients during the decade. This fact can lead to different focuses in health policies considering that these data are evidence of deficiencies in prenatal, childbirth, and newborn care.

The predominant causes of deaths were disorders during the perinatal period (CID-10 chapter XVI),[1] which also implies in deficiencies in the mother and newborn care.

The coefficients of mortality from zero to five years old in children from locations outside Uberlândia increased indicating the growth of the city as a reference in medical care for the region.

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