



HEALTH SITUATION ANALYSIS: FETAL MORTALITY IN THE 10TH HEALTH REGION OF CEARÁ

Análise da situação em saúde: a mortalidade fetal na 10^a região de saúde do Ceará

Análisis de la situación de salud: la mortalidad fetal de la 10^a región de salud de Ceará

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ABSTRACT

Objective: To analyze the health situation, in the context of fetal mortality, in the 10th Health Region of Ceará. **Methods:** Cross-sectional, descriptive and retrospective study with information regarding 71 fetal deaths of mothers living in Limoeiro do Norte 10th Health Region of Ceará, which occurred in the period from 2012 to 2013. The study used data from the Brazilian Mortality Information System (SIM) and the Fetal Death Investigation Reports, which were analyzed in absolute and relative frequencies. **Results:** It was observed that 52.1% (n=37) of fetal deaths occurred in women aged under 30 years. Of the mothers, 35.2% (n=25) were in their first pregnancy; 49.3% (n=35) started prenatal care before 12 gestational weeks, and 64.7% (n=46) experienced complications during pregnancy. Of the deliveries, 36.6% (n=26) occurred between 37 and 41 weeks of gestation, and 67.6% (n=48) were vaginal delivery. Of the stillborns, 31% (n=22) had weight above 2,500g, and 38% (n=28) had intrauterine hypoxia as the underlying cause of death. **Conclusion:** The health situation regarding fetal mortality showed a high death rate in the year 2013 (14.5/1,000 births), whose mothers were young, in their first pregnancy and experiencing gestational complications, with deaths occurring before delivery, low birth weight and intrauterine hypoxia.

Descriptors: Fetal Death; Prenatal Care; Delivery of Health Care.

RESUMO

Objetivo: Analisar a situação de saúde, no contexto da mortalidade fetal, na 10^a Região de Saúde do Ceará. **Métodos:** Estudo transversal, descritivo, retrospectivo, com informações referentes a 71 óbitos fetais de mães residentes da 10^a Região de Saúde do Ceará, ocorridos no período de 2012 a 2013. Utilizaram-se dados do Sistema de Informação sobre Mortalidade e das Fichas de Investigação do Óbito Fetal, que foram analisados em frequências absolutas e relativas. **Resultados:** Observou-se que 52,1% (n=37) das mortes fetais ocorreram em mulheres com menos de 30 anos. Das mães, 35,2% (n=25) eram primigestas, 49,3% (n=35) iniciaram o pré-natal antes de 12 semanas gestacionais e 64,7% (n=46) tiveram complicação na gestação. Dos partos, 36,6% (n=26) deles ocorreram entre 37 e 41 semanas de gestação, e 67,6% (n=48) por via vaginal. Dos natimortos, 31% (n=22) tinham peso acima de 2.500g, e 38% (n=28) tiveram hipóxia intrauterina como causa básica da morte. **Conclusão:** A situação de saúde quanto à mortalidade fetal evidenciou alta taxa de óbitos no ano de 2013 (14,5/1.000 nascimentos), cujas mães eram jovens, primigestas e com complicações gestacionais, com mortes ocorridas antes do parto, baixo peso e hipóxia intrauterina.

Descritores: Morte fetal; Assistência Pré-Natal; Assistência à Saúde.



RESUMEN

Objetivo: Analizar la situación de salud en el contexto de la mortalidad fetal de la 10ª Región de Salud de Ceará. **Métodos:** Estudio transversal, descriptivo y retrospectivo con informaciones de 71 óbitos fetales de madres residentes de la 10ª Región de Salud de Ceará en el periodo entre 2012 y 2013. Se utilizaron los datos del Sistema de Información sobre Mortalidad y de las Fichas de Investigación del Óbito Fetal que fueron analizados en frecuencias absolutas y relativas. **Resultados:** Se observó que el 52,1% (n=37) de las muertes fetales se dieron en mujeres con menos de 30 años. Entre las madres, el 35,2% (n=25) eran primigestas, el 49,3% (n=35) iniciaron el prenatal antes de las 12 semanas de gestación y el 64,7% (n=46) tuvieron complicaciones en la gestación. Entre los partos, el 36,6% (n=26) se dieron entre 37 y 41 semanas de gestación y el 67,6% (n=48) por vía vaginal. Entre los natimortos, el 31% (n=22) tenían más de 2.500g de peso y el 38% (n=28) tuvieron hipoxia intrauterina como causa básica de muerte. **Conclusión:** La situación de salud respecto a la mortalidad fetal evidenció elevada tasa de óbitos en el año de 2013 (14,5/1.000 nacimientos) cuyas madres eran jóvenes, primigestas, con complicaciones en la gestación y con muertes antes del parto, bajo peso e hipoxia intrauterina.

Descriptor: Muerte fetal; Atención Prenatal; Prestación de Atención de Salud.

INTRODUCTION

The terms fetal death and stillbirth are defined as death prior to the complete expulsion or extraction of a product of human conception from its mothers, irrespective of the duration of the pregnancy. The death of the fetus is indicated by the absence of any evidence of life after expulsion or extraction⁽¹⁾. In Brazil, fetal death includes fetus with birth weight equal to or less than 500 grams, gestational age of 22 weeks (154 days) and/or head to heel length of 25 cm or more⁽²⁾.

An estimated 2.6 million fetal deaths occur every year worldwide and nearly all of them (98%) are in developing countries⁽³⁾.

In Brazil, fetal deaths occur in a high frequency and outnumber the cases of neonatal deaths (death in the first 28 days of life)⁽⁴⁾. The Northeast region presented a fetal mortality rate of 13.4 per 1,000 births in 2012 – the highest in the country. In the same year, the state of Ceará presented a rate of 12.6 deaths per thousand births, while the national average was 11 deaths/1,000 births^(5,6).

In the 10th Health Region of Ceará, located in Limoeiro do Norte, the number of fetal deaths has increased over the years. An analysis carried out in this region showed that there was a 20.8% reduction in the number of infant deaths in the years 2009 to 2013. However, there was a 15% increase in fetal deaths during the same period⁽⁶⁾.

Over the last decades, the reduction of infant deaths has been one of the priorities among public policies in several countries⁽⁷⁾. However, the same has not happened with fetal death, which has not yet been included in the world health agenda, nor was it a concern among the United Nations (UN) Millennium Development Goals^(8,9).

Stillbirth is considered a sensitive health indicator to assess the life conditions of a population since it reflects the health status of women, the quality of and accessibility to primary health care provided to pregnant women, and the quality of intrapartum care^(10,11).

The etiology of fetal death is multifactorial, involving interrelated factors that include socioeconomic condition, biological factors and the quality of health care⁽¹¹⁻¹³⁾.

Fetal mortality is a poorly studied maternal and child health problem, although fetal deaths are influenced by the same circumstances and etiologies as early neonatal deaths. In addition, little attention has been given to the causes of these deaths since they are associated with a fatal eventuality^(1,9,10,14).

Stillbirth is one of the most important adverse outcomes; however, it is still poorly understood and recognized in pregnancy⁽⁹⁾. Since it is not a health indicator, fetal death has historically been neglected by health services and it has not been incorporated into work routines, discussions and analyses of its occurrence, nor are specific investments made to reduce stillbirths^(1,10).

Given the aforementioned context, the present study aimed to analyze the health situation, in the context of fetal mortality, in the 10th Health Region of Ceará.

METHODS

This is a descriptive and retrospective cross-sectional study carried out in the 10th Health Region of Ceará, which belongs to one of the 22 health regions of the health care model of the state of Ceará. The region comprises 11 municipalities, according to the 2014 Regionalization Master Plan (*Plano Diretor de Regionalização – PDR*) and has a total population of 220,167 inhabitants^(15,16).

The Health Regions are continuous geographic spaces consisting of groups of bordering municipalities bounded by cultural, economic and social identities and of communication networks and shared transport infrastructure aimed at integrating the organization, planning and implementation of health actions and services⁽¹⁷⁾.

The study population comprised all fetal deaths of mothers living in the eleven municipalities of the aforementioned Health Region from the 1st of January 2012 to 31st of December 2013.

The Death Certificate (DC) available in the Mortality Information System (*Sistema de Informação sobre Mortalidade – SIM*) was used as data source. However, some information are not included on the DC, such as the medical history of the mother and information on antenatal care and childbirth care, which are important for the present study. Because of that, the study also included the Fetal and Infant Death Records, an instrument of the Ministry of Health aimed at strengthening death surveillance⁽¹⁾.

These records were included because they provide information on antenatal care, pregnancy, delivery and birth. They consist of: Fetal Death Records – Health service: outpatient and hospital; and Infant Death Records – Home Interviews, which are summarized in the Fetal and Infant Death Records – Synthesis, Conclusions and Recommendations⁽¹⁾.

Data were collected from March to April 2015 through visits to the Department of Epidemiological Surveillance of the Municipal Health Secretariat of the eleven municipalities belonging to the Health Region. Data were collected using a semi-structured form addressing sociodemographic variables of the mother (age and education), gestational variables (previous gestational history, start of antenatal care, pregnancy complication and type of complication), delivery variables (reason for seeking care at delivery time, pregnancy duration in weeks and type of delivery), and stillbirth variables (death in relation to delivery, birth weight and underlying cause of death).

The data obtained from the DC and the Fetal Death Records were transported to a database and analyzed using absolute and relative frequencies in Epi-Info version 7.1.2.0.

This study was approved by the Research Ethics Committee of the School of Public Health of Ceará, with Approval No. 958.482. The study complies with Resolution 466/12.

RESULTS

There were 71 fetal deaths in the 10th Health Region of Ceará in the period analyzed. Only one out of the eleven municipalities in the region did not present any fetal deaths in the years analyzed.

In 2012, fetal deaths accounted for 43.7% (n=31) of the total analyzed, while in 2013 the percentage was 56.3% (n=40). Fetal mortality rates were 11 fetal deaths per 1,000 births in 2012 and 14.5 deaths per 1,000 births in 2013.

Regarding the sociodemographic characteristics of the mother, 52.1% (n=37) of the fetal deaths occurred in women aged 20 to 30 years. Mothers aged 35 years or older corresponded to 18.3% (n=13) of fetal deaths. As for education, more than half of the stillbirths – 53.5% (n=38) – occurred in women with 8 to 11 years of study (Table I).

Table I - Distribution and frequency of fetal deaths according to the sociodemographic variables of the mother. 10th Health Region of Ceará, Brazil, 2012 to 2013.

Variables	2012		2013		Total	
	n	%	n	%	n	%
Mother's age (in years)						
< 19	5	16.1	5	12.5	10	14.0
20 – 30	14	45.1	23	57.5	37	52.1
31-34	3	9.7	4	10.0	7	9.9
35 or older	7	22.6	6	15.0	13	18.3
No information	2	6.5	2	5.00	4	5.7
Education (in years of study)						
None	1	3.2	1	2.50	2	2.82
1 – 3	3	9.7	1	2.50	4	5.63
4 – 7	8	25.8	12	30.00	20	28.2
8 – 11	16	51.6	22	55.00	38	53.5
No information	3	9.7	4	10.00	7	9.9

Source: Mortality Information System (*Sistema de Informação sobre Mortalidade*). Fetal Death Records.

With regard to pregnancy variables, fetal deaths occurred more consistently in primigravida (first gestation) – 35.2% (n=25) of the cases. The frequency of women with gestational history of stillbirth was 28.2% (n=20). In all, 49.3% (n=35) of the mothers attended the first antenatal consultation before 12 weeks of pregnancy. Regarding pregnancy complications, 64.7% (n=46) of the mothers had some complication. In addition, 50.0% (n=23) of the women who presented complications during pregnancy had gestational hypertension (Table II).

Table II - Distribution and frequency of fetal deaths according to gestational variables. 10th Health Region of Ceará, Brazil, 2012 to 2013.

Variables	2012		2013		Total	
	n	%	n	%	n	%
Previous Gestational History						
Live birth	9	29.0	14	35.0	23	32.4
Stillbirth	8	25.8	12	30.0	20	28.2
None	12	38.7	13	32.5	25	35.2
No information	2	6.5	1	2.5	3	4.3
Start of antenatal care (in weeks)						
≤12	11	35.5	24	60.0	35	49.3
≥ 13	11	35.5	13	32.5	24	33.8
No information	9	29.0	3	7.5	12	16.9
Gestational complications						
Yes	21	67.7	25	62.5	46	64.7
No	4	13.0	8	20.0	12	17.0
No information	6	19.3	7	17.5	13	18.3
*Type of complication						
Hypertension	11	52.4	12	48.0	23	50.0
Urinary Infection	7	33.3	10	40.0	17	37.0
Diabetes	1	4.8	2	8.0	3	6.5
Rh negative	2	9.5	1	4.0	3	6.5

Source: Mortality Information System (*Sistema de Informação sobre Mortalidade*). Fetal Death Records.

*Percentage calculated considering only the total of complications informed.

Regarding the reasons for seeking care at the time of delivery, only 69% (n=49) of the cases presented information on this variable; of these, 33.8% (n=24) of the pregnant women sought care due to absent fetal movements. In addition, there was a higher frequency of fetal deaths between 37-41 weeks of pregnancy – 36.6% (n=26). It should be noted that 41% (n=29) of the fetal deaths occurred between 28 and 36 weeks of pregnancy. As for the type of delivery, 67.6% (n=48) were vaginal deliveries (Table III).

Table III - Distribution and frequency of fetal deaths according to delivery variables. 10th Health Region of Ceará, Brazil, 2012 to 2013.

Variables	2012		2013		Total	
	n	%	n	%	n	%
Reason for seeking care at the time of delivery						
Absent movements	10	32.2	14	35.0	24	33.8
Contractions	8	25.8	9	22.5	17	24.0
Bleeding	4	13.0	6	15.0	10	14.1
No information	9	29.0	11	27.5	20	28.1
Duration of pregnancy (in weeks)						
< 22	1	3.2	0	0.0	1	1.4
22-27	3	9.7	12	30.0	15	21.0
28-31	5	16.1	7	17.5	12	17.0
32-36	7	22.6	10	25.0	17	24.0
37-41	15	48.4	11	27.5	26	36.6
Type of delivery						
Vaginal	18	58.1	30	75.0	48	67.6
C-section	11	35.5	9	22.5	20	28.2
No information	2	6.4	1	2.5	3	4.2

Source: Mortality Information System (*Sistema de Informação sobre Mortalidade*). Fetal Death Records.

Regarding the stillbirth variables, the analysis of fetal death in relation to delivery revealed that 83.1% (n=59) of the deaths occurred prior to delivery and 9.8% (n=7) occurred during delivery. As for birth weight, there was a higher occurrence of fetal deaths in fetuses weighing more than 2,500 grams, with a frequency of 31% (n=22). However, most of the stillbirths (63.3%) were underweight, with 33.8% (n=24) of them weighing more than 1,500 grams. The analysis of the underlying cause of fetal death according to the International Classification of Diseases and Related Health Problems, Tenth Revision – ICD-10 revealed higher frequencies of deaths due to P20 (intrauterine hypoxia), which accounted for 38% (n=27) of the cases. It should be noted that 21% (n=15) of the causes of death were unknown (P95) (Table IV).

Table IV - Distribution and frequency of fetal deaths according to stillbirth variables. 10th Health Region of Ceará, Brazil, 2012 to 2013.

Variables	2012		2013		Total	
	n	%	n	%	n	%
Death in relation to delivery						
Before	26	83.8	33	82.5	59	83.1
During	3	9.7	4	10.0	7	9.8
No information	2	6.5	3	7.5	5	7.1
Birth weight						
< 1.500	5	16.1	16	40.0	21	29.5
1.500 - 1.999	5	16.1	11	27.5	16	11.3
2000 - 2.499	5	16.1	3	7.5	8	22.5
> 2.500	14	45.2	8	20.0	22	31.0
No information	2	6.5	2	5.0	4	5.7
Underlying Cause of Death						
P.20 (Intrauterine hypoxia)	8	25.8	19	47.5	27	38.0
P.00 (Fetus and newborn affected by maternal conditions)	5	16.1	4	10.0	9	12.7
P.02 (Fetus and newborn affected by complications of placenta, cord and membranes)	6	19.3	6	15.0	12	17.0
P.95 (Fetal death of unspecified cause)	8	25.8	7	17.5	15	21.0
Other causes	4	13.0	4	10.00	8	11.3

Source: Mortality Information System (*Sistema de Informação sobre Mortalidade*). Fetal Death Records.

DISCUSSION

The fetal mortality rate in the 10th Health Region of Ceará was high in 2013 (14.5 / 1,000 births). In the same period, the Northeast region presented a rate of 13.3 fetal deaths/1,000 births, with 12 deaths per thousand births in the state of Ceará^(5,6).

Stillbirth rates reveal important information about health conditions, antenatal care and childbirth in a given region^(5,14). In Brazil, few studies have analyzed fetal death alone. The literature addresses fetal death and infant mortality together and restricted to the perinatal period (fetal deaths plus early neonatal deaths)⁽¹⁰⁾. This leads to a low visibility of the problem and little interest in understanding that this event is highly avoidable with the implementation of and access to quality maternal care services^(3,18). Maternal age and education were associated with stillbirth and have received great attention because of their interrelationship with other factors associated with fetal death^(11,13,19).

In the present study, there was a high percentage of fetal deaths in mothers under the age of 30 (52.1% of the cases). This finding is consistent with those of other studies in which age below 30 was significantly associated with stillbirths^(19,20).

With regard to education, most of the mothers analyzed in the present study had 8 to 11 years of study (53.5%). This finding is contrast with the literature which points out an important association between low education and fetal death^(11,12,19).

Regarding gestational variables, there was a higher number of fetal deaths associated with primigravida in the present study. Nulliparity and previous reproductive history of perinatal death are considered gestational risk factors⁽²¹⁾. Importantly, the proportion of pregnant women with gestational history of stillbirths should be highlighted – (28.2%, n=20). There is an increased risk of recurrence of fetal death in pregnant women with a previous history of stillbirth^(12,22).

With regard to the start of antenatal care, a failure in early enrollment of pregnant women is assumed given that only 49.3% (n=35) of the women in the present study started antenatal care before the first trimester of pregnancy. Early identification – up to the 12th week of pregnancy – of all pregnant women in the community to start antenatal care in Primary Health Care centers is one of the indicators of the quality of antenatal care delivered in Primary Health Care. In addition, it contributes to the early detection and treatment of risk situations^(12,23).

Researches have reported the association between maternal diseases and fetal death^(11,12,19). The most important pregnancy complication in the present study was hypertension. Hypertensive pregnant women present a higher risk of fetal death⁽¹²⁾.

Hypertensive changes in pregnancy are associated with severe fetal and maternal complications and with a higher risk of perinatal mortality due to changes in placental blood flow determined by the disease or treatment⁽²¹⁾.

Professionals who provide care to pregnant women should be aware of the existence of risk factors and should be able to evaluate them dynamically in order to determine the time when the pregnant woman will require specialized care or interconsultation with other professionals. Interventions, especially in the course of a pregnancy that has a greater chance of having an unfavorable outcome, can help reducing the risks to which the pregnant woman and the fetus are exposed and minimize possible adverse consequences^(21,23).

Regarding the delivery variables, 33.8% of the pregnant women in the present study sought care at the time of delivery due to absent fetal movements. However, there is insufficient information to indicate the time between detection and care in the health service. The occurrence of fetal death before delivery is related to maternal conditions and to antenatal care^(10,24).

The results of the present study show that most of the deaths occurred in late pregnancies (> 28 weeks of pregnancy), that is, with fetuses with great potential for survival. This finding suggests that the quality of antenatal care is still not satisfactory, although Primary Care teams in the 10th Health Region of Ceará covered 98.8% of the population during the study period. The high number of stillbirths at the end of pregnancy shows the close relationship between these deaths and the quality of health services that deliver care to pregnant women⁽¹⁰⁾.

Another variable studied in the present study was the type of delivery, which was mostly (67.6%) vaginal. This finding is explained by the fact that vaginal delivery is recommended in pregnant women with fetal death⁽²⁵⁾. Although vaginal delivery is the primary indication for stillbirths^(25,26) and fetal death is not an indication of C-section, the number of C-sections (28.2%) stands out. C-section for the extraction of a dead fetus may be exceptionally indicated in some situations, such as placenta previa, repetitive C-sections, placental abruption, hypertensive syndromes, and other associated maternal diseases⁽²¹⁾. C-section rates have increased worldwide, particularly in Brazil. However, it should be noted that these indications are not formal, even in live births. Thus, C-section in a stillbirth can be erroneously justified in these situations; additionally, there is an increased risk of stillbirth following C-section delivery^(21,25,26).

The analysis of stillbirth variables revealed a higher frequency of fetal deaths (83.1%) before labor. This finding is similar to those found in developed countries, where circa 10% of fetal deaths occur during labor⁽¹²⁾. Some avoidability classifications based on the possibility of prevention have been used to analyze infant and fetal deaths, focusing on deaths caused by potentially treatable problems. For instance, there is the Wigglesworth Classification, which states that a high proportion of antepartum deaths reflect failure in antenatal care or adverse maternal conditions^(1,10,24).

With regard to birth weight, there was a predominance of fetal deaths with low weight, a result similar to those of other studies^(11,13). It should be noted that there was a significant proportion of stillbirths (31%) weighing 2,500 grams or more. This weight indicates a high chance of survival because longer pregnancies and/or heavier weights are found to be associated with greater fetal viability, i.e., greater chances of survival⁽⁸⁾. Therefore, since birth weight is an isolated factor of major importance for infant survival⁽¹³⁾, it should be taken into consideration in any analysis of the avoidability of infant and fetal death.

Regarding the causes of death, intrauterine hypoxia (P.20 – ICD 10) was the main cause of fetal death in 38% of the cases analyzed in the present study. This result is similar to that of a study conducted in Salvador, Bahia, which revealed a high rate of hypoxia among fetal deaths⁽¹³⁾. Hypoxia was correlated to failures in obstetric management and antenatal and childbirth care, which indicated a poor quality of care in health services⁽¹³⁾. In Brazil, the main causes of perinatal death, including perinatal asphyxia, are the conditions that can be prevented through adequate antenatal and childbirth care⁽¹⁰⁾. In the present study, there were frequent cases in which the physician reported only “anoxia” or “hypoxia” without reporting the underlying cause of the problem.

Another important fact to be considered in relation to stillbirths is the high percentage of fetal deaths of unspecified causes (P.95 – ICD 10), which corresponded to 21% of the deaths found in the present study. Therefore, there are serious limitations in the recording of causes and in the quality of information, which significantly compromise a better diagnosis^(8,9). The occurrence of fetal death of unspecified cause should be assessed so as to identify its etiology and to facilitate the adoption of preventive measures⁽²⁴⁾.

The results of the present study also highlight the poor completion of the Death Certificates and Fetal Death Records, in which information on many variables were missing. This is a disturbing finding because it reflects the insufficient knowledge or valorization of the completion of DC and records. The adequate provision of data could help identify and analyze the magnitude of mortality and to evaluate the actions implemented^(1,27).

The constitution of death prevention committees establishes the improvement of data presentation and the analysis of the circumstances of death. In addition, the quality of information is an important step to adequately assessing the profile of mortality according to cause and factors⁽²⁸⁾.

Finally, it is believed that studies on stillbirths significantly contribute to the planning of actions aimed at improving maternal health and avoiding fetal deaths.

CONCLUSION

Fetal mortality increased during the period analyzed, with a high rate in 2013 (14.5 deaths/1,000 births). Fetal deaths occurred among young mothers, primigravida, and women with gestational complications. Deaths occurred before delivery, in low weight fetuses, and due to intrauterine hypoxia.

Although fetal death causes loss that implies anguish in the mother's life, its occurrence is still associated with an eventuality that cannot be prevented and that has been neglected by health services.

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