

Profile of women affected with premature childbirth and neonatal outcomes

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Abstract

Objectives: to describe the profile of women affected with premature childbirth and neonatal outcomes at a referral maternity in the city of Fortaleza-CE, Brazil.

Methods: descriptive and retrospective documentary type study, with a quantitative approach, carried out from January to December, 2017, with 253 medical records of women who had premature childbirth in a referral maternity.

Results: the average age was 28, with the prevalence of women living in a stable union, graduated from high school and without formal work. The gestational mean average was three pregnancies, gestational age of 34 weeks and three days, and six prenatal consultations, starting in the first trimester. The major intercurrent was pre-eclampsia. In relation to the neonatal data, there was a prevalence of male newborns, with an average of 2.251 kg and a score of seven on the 1-minute Apgar and eight on the 5-minute Apgar. Newborns in going to a hospital accommodation after childbirth and in room air, spending an average of 12.71 days in the hospital.

Conclusion: in this case of this research, knowing the woman's profile and the outcomes in premature newborns is useful to encourage public policies and reduce the sequelae on mother and baby

Key words *Premature, Labor, Risk factors*



Introduction

Prematurity is the main condition associated with neonatal and infant mortality, with an increase in cases worldwide. In Brazil, the national rate of prematurity increased from 9.8% in 2011, to 11.86% in 2012, being among the top 10 countries with the most premature births, at around 280 thousand preterm childbirths in the country, becoming even more significant when it is known that 70% of preterm infants die within 28 days of life.^{1,2}

Infant mortality corresponds to the child's death in the first year of life, either in the neonatal period, which corresponds to death occurring between zero and 27 days of life, or the postnatal period, with death occurring between 28 and 364 days of life.³

The main component of infant mortality is early neonatal mortality, with most deaths occurring in the first 24 hours, indicating a close relationship to childbirth and birth, prematurity being among the main causes, as well as congenital malformation, intrapartum asphyxia, perinatal infections and maternal factors.⁴

Many born preterm evolve with sequelae in several systems, increasing infant morbimortality. With a premature NB, the mother faces the unexpected: dealing with a baby who may not survive or will require greater care.^{5,6}

Brazil managed to reduce infant mortality rates, from 51 deaths per thousand live births in 1990, to 15 per thousand live births in 2015, but the rates remain high, with 19.88 deaths per thousand live births and neonatal mortality representing 70% of child deaths in all regions of the country.⁷

Also, low maternal socioeconomic level is associated with prematurity, due to malnutrition, infections and the lack of proper prenatal care, as well as smoking, drug abuse, multiple gestations and great physical and psychological stress. Pregnancy during adolescence, one of the extreme reported age group, evidences that this group has a relation with premature childbirth and low birth weight newborns, being attentive with other combined factors, such as social vulnerability, reduced access to health services, inadequate habits and nutrition, among others.^{8,9}

While adolescence is associated with premature childbirth, so is advanced maternal age. Due to changes in the women's lifestyle, pregnancies after 40 years old are more frequent, being associated with fetal, maternal, the newborn complications and during pregnancy and childbirth.¹⁰

Thus, the best way to avoid or reduce mortality rates and the problems and sequelae associated with

prematurity is to reduce premature births. Therefore, it is necessary to identify its main risk factors and act. The ideal time for this is prenatal care, which has been shown to be an empowering factor in reducing premature birth rates, due to the better evaluation of pregnant women and time to pass on essential information.^{11,12}

Based on the above, this study justifies by the need to reduce cases on premature childbiths, due to the implications related to this period of births, and to understand the risk factors that lead to this outcome, thus, being able to avoid them. Moreover, it is noted that, in the studied maternity, in 2017, there were 4,853 childbiths, out of which 1,375 (28.3%) were premature, making the analysis of their influential factors necessary when aiming at reducing this rate.

Thus, this study seeks to answer these questions: what is the profile of women affected with premature childbith? and what are the neonatal outcomes? As our goal is to describe the profile of women affected with premature childbith and the neonatal outcomes in a referral maternity in the city of Fortaleza-CE, Brazil.

Methods

Descriptive, retrospective documentary study with a quantitative approach. A documental study is an empirical investigation, whose purpose is the delineation or analysis of the characteristics of facts or phenomena, the evaluation of programs, or the isolation of the main variables or keys.¹³

Descriptive studies consist of observing, describing and documenting aspects of a given situation. A quantitative research, which has its roots in logical positivist thinking, tends to emphasize deductive reasoning, the rules of logic, and the measurable attributes of the human experience.¹⁴

The study was carried out at the *Maternidade Escola Assis Chateaubriand* (MEAC), an institution of reference in the state of Ceará, belonging to the Hospital complex of the *Universidade Federal do Ceará* (UFC), associated with the *Sistema Único de Saúde* (SUS), (Brazilian Public Health System) where activities of average and high complexity are developed, in hospital care and outpatient care for the woman and the newborn. The mission is to promote formation in human resources to promote learning, teaching, research and extension, providing service of excellence to the woman and the newborn. Data was collected from women who had NBs between January and December, 2017.

The population was comprised of women who

had premature childbirth between the months of January and December of 2017, in the aforementioned maternity. Secondary sources were used for data collection. The inclusion criteria for this study were puerperal women whose outcome was the birth of newborns from 21 weeks to 36 weeks and six days. Women who birthed newborns with congenital malformations and those who were not possible to calculate the gestational age (lack of maternal information or neonatal deaths before the physical examination and New Ballard Score calculation) were excluded.

Considering that in 2017 there were 4,853 childbirths at the studied maternity, among vaginal and abdominal childbirths which, 1,375 were premature childbirths, 253 women were researched using the sample calculation formula for finite populations.

It was a simple random sample, where each component of the population has the same chances of being chosen to compose the study, being calculated and based on the following formula for finite populations, as previously mentioned, applying the confidence coefficient of 95%, the prevalence of 28% for premature labor and maximum permissible error of 5%, with a final total sample size of 253 women. The formula used for the sample calculation was¹⁵:

$$n = \frac{Z^2 \cdot p \cdot q \cdot N}{e^2 \cdot (N-1) + Z^2 \cdot p \cdot q}$$

In which:

- n = Size of the sample;
- Z² = Confidence coefficient;
- N = Complementary sum;
- q = Percentage in which the phenomenon occurs;
- p = Percentage to the population and
- e² = Maximum permissible error.

Data collection took place between July and October 2018, data which was obtained from the women's medical records, the newborn's, the *Declaração de Nascidos Vivos* (Live Births Statements) and the NB's assessment form, using a previously elaborated tool.

The *Formulário de Identificação do Perfil Sociodemográfico, Obstétrico e Neonatal* (Sociodemographic, Obstetric and Neonatal Profile Identification Form) was used, divided into four blocks: identification data, obstetric history, pregnancy and current childbirth, and neonatal component. The study data was collected and managed using the REDCap1 electronic data collection and management tool, located at the *Unidade de*

Pesquisa Clínica do Complexo de Hospitais Universitários da UFC (Clinical Research Unit of the UFC University Hospitals Complex) and organized in tables.¹⁶

The project was submitted to the Research Ethics Committee of the *Maternidade Escola Assis Chateaubriand*, via Plataforma Brasil, under the number 2,786,220. A Faithful Depositary term was signed, as this research is with secondary sources.

Results

In 2017, there were 4,853 childbirths at the studied institution, among vaginal and C-sections, of which, 1,375 were premature, corresponding to 28.3% of all childbirths at the hospital.

When evaluating the sociodemographic profile of the 253 women who had premature childbirths in 2017 in the respective maternity, it was found that, with regards to the origin of the women surveyed, 63.1% were from the capital - Fortaleza - and 36.9% were from the countryside.

The women's minimum age presented in the study was 12 years and the maximum was 46, with a mean of 28 years (SD=7.29). In regard to marital status, there were women living in a stable union, corresponding to 41.9%, 37.2% graduated from high school. As for occupation, 49.1% were housewives (Table 1).

In relation to obstetric history, the number of pregnancies ranged from 1 to 11, with a gestational average of three pregnancies (SD=1.58), with childbirths ranging from none to eight, with the mean of one birth (SD=1.27). Of them, 75 were primiparous (29.6%) and 178 multiparous (70.4%). Abortions varied between none and four, the mean was 0.4 abortions (SD=0.76).

When relating to stillbirths, it ranged from zero to two, with a mean of 0.01 stillbirths (SD=0.13). Regarding the number of C-sections, the occurrence varied from zero to four, with a mean of 0.43 (SD=0.78) and normal childbirths ranged from zero to eight, with a mean of 0.74 (SD=1.20).

In regards to the data on the current pregnancy and childbirth, the gestational age ranged from 21 to 36 gestational weeks, with a mean of 34 gestational weeks (SD=3.0) and, as for the days, zero to six days, with a mean of three days (SD=2.05), resulting in a gestational average of 34 weeks and three days. When researching how the gestational age was measured, 79.9% were performed by ultrasound (US) in the first trimester, 14.3% in the second, 2.7% in the third, 1.9% by the date of the last menstruation and 1.2% by Capurro.

Table 1

Distribution of sociodemographic characteristics of women who had premature childbirths in Fortaleza, CE, Brazil, 2017 (n=253).

Variables	N	%
Origin		
Capital	159	63.1
Countryside	93	36.9
Marital Status		
Single	65	25.7
Stable union	106	41.9
Married	81	32
Widowed	0	0
Divorced	1	0.4
Schooling		
No schooling	1	0.4
1 st to 4 th grade	8	3.2
5 th to 9 th grade	73	28.8
Graduated from High School	94	37.2
High School not concluded	41	16.2
Graduated from Higher Education	25	9.9
Higher Education not concluded	11	4.3
Occupation		
Housewife	124	49.1
Student	22	8.7
Farmer	13	5.1
Teacher	10	3.9
Others	84	33.2

Prenatal consultations varied between 0 and 13 consultations, with an average of six consultations (SD=1.33). Regarding the beginning of prenatal care, 69.7% started in the first trimester, 20.1% in the second and 0.8% in the third, while 9.4% of the medical records did not have any information on the beginning of prenatal care.

Regarding the use of tobacco, 94.9% did not smoke and 5.1% did. With regards to consuming alcohol, 95.3% did not drink and 4.7% drank alcohol during the pregnancy. When investigating the use of illegal drugs, 98% did not use drugs and 2% made use of some sort of illicit drug.

Regarding to intercurrentence in the pregnancy, most cases were pre-eclampsia, at 42%, followed by urinary tract infection in the third trimester (24.4%), threatened preterm childbirth (22.3%), multiple pregnancy (11.6%), diabetes (11.6%), first trimester bleeding (9.4%) and intrauterine growth restriction (1.3%). There were also other intercurrentences that totaled 33%, among which, hypothyroidism, syphilis, arboviruses, retroviruses and others (Table 2).

Previous preterm childbirths ranged from zero to

four, with a mean of 0.86, being that 85.8% were not shown in their medical records. Corticoid doses ranged from none to five, with a mean of 1.2 (SD=0.88), with 4.3% without any registration.

As for hospitalizations during pregnancy, 70.4% did not need to be hospitalized for any reason and 29.6% were hospitalized. When researching the reason for this hospitalization: 30.6% were for pre-eclampsia; 20% were due to premature rupture of ovular membranes; 13.3% were due to premature labor and 13.3% for other reasons, and 10.6% of the information was missing from the medical records.

In relation to the current type of pregnancy, 87.7% were single and 12.3% were double. The most prevalent type of childbirth was cesarean (66.8%), followed by vaginal childbirth (33.2%). The most prevalent indication for a C-section was pre-eclampsia (40.2%), followed by twins (10.6%), previous C-section (8.9) and others (53.2%).

Regarding neonatal data, 53.5% were males and 46.5% females. The weight varied between 490 grams and 3.840 kilograms, with an average of 2.251 kilograms (SD=671). First-minute Apgar scores ranged from 1 to 10, with a mean of 7 (SD=2) and,

in the fifth minute, it ranged from 3 to 10, with a mean of 8 (SD=1).

When the fetal presentation before birth was investigated, 79.8% were cephalic, 18.5% pelvic and 1.7% transverse. Regarding cesareans occurred before labor, 62.7% were before and 37.3% after labor had already started.

When investigating to which unit the premature newborn was taken, 39.2% were sent to hospital

accommodation, 31.6% went to the Intensive Care Unit, among 3A and 3B, and 29.2% to the *Unidade de Cuidados Intermediários Convencionais* (UCINCO) (Conventional Intermediate Neonatal Care Unit), among UCINCO I and II. When assessing which respiratory mechanism the patient left the neonatology room with, 49.1% left in room air, 26.1% in Hood, 13.4% were intubated and 11.4% were on CPAP. Hospital leave varied between zero

Table 2

Distribution of women who had premature childbirths, according to obstetric intercurrents. Fortaleza - CE, Brazil, 2017 (n=253).

Variables	N	%
Pre-eclampsia	94	42.0
Prior Hypertension	23	10.3
1 st trimester urinary tract infection	45	20.1
2 nd trimester urinary tract infection	36	16.1
3 rd trimester urinary tract infection	57	24.4
Treated urinary tract infection	67	29.9
Untreated urinary tract infection	32	14.3
Multiple pregnancy	26	11.6
Threatened preterm childbirth	50	22.3
1 st trimester bleeding	21	9.4
2 nd trimester bleeding	14	6.3
3 rd trimester bleeding	16	7.1
Diabetes	12	5.4
Diabetes using insulin	9	4.0
Diabetes using hypoglycemic	5	2.2
Intrauterine growth restriction	8	1.3
Cardiopathy	2	0.9
Others	74	33.0

and 132 days, with an average of 12.71 days (SD=21.46).

Discussion

The sociodemographic data was similar to another study, in which puerperal women with premature birth had a mean age of 20 to 29 years, a steady partner, up to eight years of study and did not engage in paying job, in addition a significant association with the maternal schooling and occupation to prematurity variable. The lower the schooling, the greater the chances of prematurity. Therefore, these women tend to constitute a social group in a disadvantage of material resources and social support and, likewise, unpaid occupation.¹²

Also, with regards to maternal age, in another study was found that adolescent mothers are more likely to have preterm children and have low 5-

minute Apgar scores compared to adult women.¹⁷ Another research, complementing the previous one, found significance when relating women over 35 years of age and prematurity.¹⁸

However, it is not known if age is an independent risk factor or if it is mistaken for chronic illnesses and sociodemographic factors, since advanced age increases the chances of chronic illnesses and complications during pregnancy. However, in the current study, the average age was 28, thus, not in the extremities of age.¹⁹

When comparing number of births, in this study, there was a greater number, eight multiparous women, which is different from a similar study that found more primiparous women.²⁰

To determine gestational age, weight is normally used as a neonatal outcome factor, when considering the preterm newborn is due to the difficulty of determining the Gestational Age (GA), but it is a

consensus to perform an ultrasound before the 20th gestational week as a best analysis. However, in this study, the methods most used to determine the GA were the date of the last menstruation and Capurro, performed by the pediatricians.¹ However, in this research, it was possible to determine GA by the first trimester using the ultrasound.

In a study that analyzed hospital births of a predetermined city, in a period of three years, significance was shown when comparing less than six prenatal consultations and prematurity. However, in our research, the average was six consultations, corresponding to the recommendation of at least this many consultations and beginning the prenatal care in the first trimester, corroborating with what is found in the literature.⁵⁻²¹

At times, it is important to observe that not only the number of consultations, but the quality of the prenatal care is essential, since a correlation between the quality in the prenatal consultation and prematurity was found, evidencing that puerperal women with premature children had lower quality in the prenatal consultation, demonstrating the need for rigorous observation and quality in this service.²²

A study with exposed and unexposed pregnant women to tobacco, had evidenced that active and passive smoking women are at higher risk of premature childbirth, when compared to non-smoking women, as well as obtaining greater chances of having children with low weight. Although the biological mechanism is not yet clear, nicotine is known to cause vasoconstriction, altering the integrity of the amniotic membranes. Moreover, on low weight, the interaction is of tobacco, influencing in the placental hypoxia, harming the exchange of nutrients.²³ However, in this study, there was no prevalence of actively-smoking women.

A study with pregnant women in Tanzania found that the predisposing factors for alcohol use during the gestation are the use of alcohol prior to the gestation, having a partner or relatives who drink, working with drinks and having previously experienced complications.²⁴ Another study points out that alcohol abuse during the gestation is harmful for both the mother and the fetus, because alcohol crosses the placental barrier, potentially having teratogenic effects.²⁵ However, once again, the studied women, in their majority, did not take alcohol.

The fact that there were complications during the gestation is significant for prematurity, pre-eclampsia is the most evident, similar to this study and, also, showing significance with the studied outcome.¹²

Concerning the use of corticoids in premature childbirth, it became evident that the protocol of the studied institution recommended two doses of the corticoid Betamethasone, or four doses of Dexamethasone, and the average of the doses was inferior to the recommended.²⁶

In accordance with another study, the use of corticoids in late preterm newborns reduced the need for respiratory support in the first 72 hours, as well as reducing the use of surfactants, resuscitation and prolonged stays in the nursery.²⁷ In another research, another gestational age group was evidenced, complementing the previous study that showed that corticoids diminish hospital mortality and morbidity rates, and supports their administration in patients from 23 to 34 gestational weeks.²⁸

When analyzing the causes for hospitalization, pre-eclampsia was the most noted. Another research also found more cases of this pathology, describing it as the main cause of maternal mortality in Brazil, the third in the world, and it being 10% or more in Brazil and affecting 2% to 8% of the gestations worldwide.² A study evidenced that more than half of the double gestations were premature, and 100% of the cases were when the gestation was triple or more.¹ However, in our study, single gestations were prevalent.

When investigating the neonatal outcomes, greater frequency of prematurity was noted in newborns with the worst Apgar scores at the fifth minute and with low birth weight. However, in relation to the sex, no significant statistical difference was found.¹⁹ In this study, the average Apgar score was appropriate, however, the average weight was low.

In another research, C-sections presented a greater ratio of premature childbirth, although with the weighing the risks in continuing the gestation against those of premature birth, pre-eclampsia being the most common cause of planned C-sections, corroborating with a study that presented prevalence of C-sections and women with pre-eclampsia, as described.¹⁹

Prematurity doubled the risk of hospitalization during the neonatal period and found an association with neonatal mortality, showing that prematurity is related to mortality and neonatal morbidity. The prevalence of hospitalization was 10 times greater in preterms when compared to full term newborns, corroborating once again with a study's finding that proved newborns spent an average of 12.71 days hospitalized.²⁹

It was observed that knowing the profile of pregnant women affected by premature childbirth in a

maternity and the respective neonatal outcomes, relating to sociodemographic characteristics, obstetric history, pregnancy and current childbirth and neonatal data, are relevant, for it allows us to trace strategies to minimize the occurrence of serious events. Thus, the research becomes relevant for stimulating public healthcare policies that aim to diminish maternal-fetal intercurrentence, guaranteeing adequate care, focusing on promoting health and the preventing sequelae.

This study presented a limitation in the absence of some information in the medical records, additional studies are being recommended in order to approach such a wide theme. Knowing and understanding premature childbirth and all its repercussions on the woman and newborn is important to improve care in the entire health-illness process.

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Author's contribution

Silva MM participated in all the stages. Brito ALS and Souto REM carried out the sampling. Vasconcelos IA participated in the sampling and discussion. Rocha RP reviewed the literature. Esteche CMGC performed the statistical analysis and results. Damasceno AKC and Moraes JL participated in the discussion. Saraiva MRB participated of the results and discussion. All authors approved the final version of this manuscript.

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