Complications in pregnancy in women aged 35 or older

Complicações na gestação em mulheres com idade maior ou igual a 35 anos

Las complicaciones del embarazo em mujeres de mayor o igual a 35 años

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How to cite this article:
Alves NCC, Feitosa KMA, Mendes MES, Caminha MFC. Complications in pregnancy in women aged 35 or older Rev Gaúcha Enferm. 2017;38(4):e2017-0042. doi: http://dx.doi.org/10.1590/1983-1447.2017.04.2017-0042.

doi: http://dx.doi.org/10.1590/1983-1447.2017.04.2017-0042

ABSTRACT

Objective: To verify the frequency and factors associated with complications during pregnancy and the association between complications with premature birth and type of delivery in pregnant women aged 35 years or older.

Methods: This is a cross-sectional study based on the records of pregnant women admitted between January and July 2012, totalling 430 pregnant women. To identify possible factors associated with complications during pregnancy, data were subjected to univariate analysis using the Poisson regression model. The chi-squared test was used to study the association of complications with premature birth ad type of delivery.

Results: Complications occurred in 77.7% of the cases. Complications in pregnancy as an explanatory variable for premature birth ($p<0.001$) and C-section ($p = 0.002$) was statistically significant.

Conclusion: The factors younger age, the absence of prenatal care, and the non-occurrence of morbidity prior to gestation were associated with complications in pregnancy.

Keywords: Pregnancy complications. High-risk pregnancy. Maternal age.

RESUMO

Objetivo: Verificar a frequência e fatores associados às complicações na gestação e a associação entre as complicações com a prematuridade e o tipo de parto em gestantes com idade maior ou igual a 35 anos.

Métodos: Estudo transversal baseado em registro de prontuário das gestantes cujo internamento ocorreu entre janeiro e julho de 2012; totalizando 430 gestantes. Para identificar possíveis fatores associados às complicações na gestação foi realizada análise univariada utilizando o modelo de regressão de Poisson. O Teste Qui-Quadrado foi utilizado para estudar a associação das complicações com a prematuridade e tipo de parto.

Resultados: As complicações ocorreram em 77,7%. A variável complicações na gestação como sendo explicativa para a prematuridade ($p < 0,001$) e cesariana ($p = 0,002$), foram estatisticamente significantes.

Conclusão: A idade mais nova, a ausência do pré-natal e a não ocorrência de morbidade anterior à gestação foram fatores associados às complicações na gestação.

Palavras-chave: Complicações na gravidez. Gravidez de alto risco. Idade materna.

RESUMEN

Objetivo: Determinar la frecuencia y los factores asociados a complicaciones durante el embarazo y la asociación entre las complicaciones con la prematuridad y el tipo de parto en las mujeres embarazadas de mayor o igual a 35 años.

Métodos: Estudio transversal basado en los registros médicos de registro de mujeres embarazadas cuyo internamiento se llevó a cabo entre enero y julio de 2012; por un total de 430 mujeres embarazadas. Para identificar los factores asociados con complicaciones durante el embarazo análisis univariante se realizó mediante el modelo de regresión de Poisson. Se utilizó la prueba de chi-cuadrado para estudiar la asociación de complicaciones con la prematuridad y el tipo de parto.

Resultados: Las complicaciones se presentaron en el 77,7%. Las complicaciones en el embarazo como variables explicativas de la prematuridad ($p <0,001$) y de la cesárea ($p = 0,002$) fueron estadísticamente significativas.

Conclusión: edad más temprana, la falta de atención prenatal y la no ocurrencia de morbilidad previa con el embarazo fueron factores asociados a complicaciones durante el embarazo.

Palabras clave: Complicaciones del embarazo. Embarazo de alto riesgo. La edad materna..

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INTRODUCTION

The growing number of pregnancies in women with advanced age (late pregnancies) has gained notoriety in scientific studies. Late pregnancies are considered pregnancies in women older than 34 years of age[1].

In Brazil, despite the drop in birth rates over the years, the number of live births among women aged 35 or more has increased considerably. According to data of the Live Births Information System ("SINASC"), 8.6% of the total live births in 2000 were from late pregnancies and this rate rose to 12.2% in 2014[2].

Studies suggest that the growing number of late pregnancies in recent years is the result of women's desire to pursue an education and a professional career, the postponement of marriage, and the increase in divorce rates followed by new unions. Moreover, the widespread and diversified availability of contraception and advances in assisted reproductive technology and healthcare are contributing to this situation[3-4].

This demographic phenomenon brings important consequences to the health of the mother and foetus. Late pregnancies predispose women to greater obstetrical risk. This risk is the result of ovarian senility and the greater frequency of pre-existing chronic diseases, which increases with the age. Older women may be subjected to more frequent hospital admissions and are more susceptible to suffering a miscarriage, considering that 40% to 60% of these women have chromosomal alterations[5].

A study found that women aged 35 or older are more likely to suffer adverse perinatal outcomes than younger women, especially premature birth, low birth weight, hypertension/preeclampsia, and a low Apgar score[5-6].

In addition to late pregnancy, low maternal education was also mentioned as being associated with an adverse outcome of pregnancy leading to low birth weight. This association is related to the socioeconomic pattern of the pregnant women resulting in low weight gain and late prenatal care[7].

The variables parity and pre-existing diseases, however, are inconsistent in information on risks associated with late pregnancies. These conditions hinder the assessment of risk solely caused by late maternal age and generate doubts as to whether a healthy women aged 35 or more, non-smoker, without a history of infertility and with favourable sociodemographic characteristics has a greater gestational risk.

Consequently, the aim of this study was to verify the frequency and factors associated with pregnancy complications and the association between complications with premature birth and type of delivery in women aged 35 or more assisted at the Women's Care Centre ("CAM") of the Instituto de Medicina Integral Prof. Fernando Figueira - IMIP.

METHODS

This is a retrospective, cross-sectional study based on medical records conducted at the CAM/IMIP from January to July of 2012. It is a census including all the pregnant women who met the inclusion criteria and who were admitted to the service during this period. This criteria were records of all women aged 35 or more admitted in the described period containing the information needed for research. In this type of study, where all the elements of the population are part of the sample, it is not necessary to calculate the sample size since it is more reliable that any sample taken from this population.

The sample consisted of all the records of pregnant women aged 35 years or more, totalling 443 pregnant women. Of these women, 13 were excluded from the study because their delivery was not monitored by the service in question and they were transferred to other health units. Thus, the study of pregnancy complications comprised 430 women. The variables of the study were age of the pregnant women, origin, race, marital status, education in years of schooling, parity (none, 1 or 2 or more), abortion (none, 1 or 2 or more), number of prenatal consultations (none, 1 to 5, and 6 or more), type of birth (vaginal or C-section), presentation (cephalic or breech), comorbidities (yes or no), and complications (yes or no). The data were collected using a standard collection tool and double-entered into an Excel® spreadsheet. The database was validated using Epi-Info 3.5.2 and analysed in Stata 12.0. The absolute and relative values of the studied variable were initially calculated. Potentially associated factors (sociodemographic variables, clinical and obstetric background) for pregnancy complications were identified using univariate analysis and the Poisson regression model with the prevalence ratios as the measures of association. The variables with $p< 0.20$ were subjected to multivariate analysis. The chi-squared test was used to study the association of the complications with premature birth and type of delivery. The variables with p-value< 0.05 were considered significant. This study was approved by the research ethics committee of the IMIP (CEP/MIP) with opinion No. 261.307/2012).

RESULTS

The records resulted in 443 pregnant women aged 35 or older. Most of these women were in the 35 to 39 years age group (73.4%), not originally from Recife (65.9%), brown-skinned (63.1%), married or in a consensual union (82.3%), with 4 to 11 years of schooling (61.2%), had given birth more than twice (42.7%), had never suffered a miscarriage (63.5%), and had no comorbidities prior to pregnancy (67.5%).

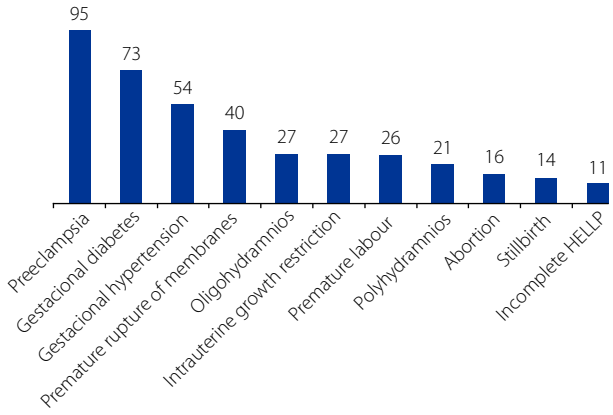
Table 1 - Sociodemographic and obstetric characteristics of the pregnant women aged 35 years or older at a reference hospital. Pernambuco, 2013

Variables	n = 443*	%
Age of pregnant women (years)		
35 to 39	325	73.4
40 and older	118	26.6
Origin		
Recife	151	34.1
Other	292	65.9
Race/Colour		
White	97	21.9
Brown	279	63.1
Olive	17	3.9
Indigenous	4	0.9
Black	45	10.2
Marital Status		
Married/Consensual Union	363	82.3
Single	78	17.7
Education (years of school)		
≤ 3	75	17.3
4 to 11	265	61.2
≥ 12	93	21.5
Parity		
None	109	25.5
1	136	31.8
2 or more	183	42.7
Abortion		
None	279	63.5
1	107	24.4
2 or more	53	12.1
Number of prenatal consultations		
None	27	6.6
1 to 5	166	40.6
6 or more	216	52.8
Type of delivery		
Vaginal	214	53
Caesarean section	190	47
Presentation		
Cephalic	344	85.8
Breech	43	10.7
Shoulder	14	3.5
Comorbidities		
Yes	142	32.5
No	295	67.5
Complications		
Yes	334	77.7
No	96	22.3

Source: Research data, 2013.
* The sample varied due to lack of information.

The frequency of complications of the 430 pregnant women in the sample was 77.7%. Graph 1 shows the main complications.

Table 2 shows the details of the statistical analysis of pregnancy complications according to the sociodemographic variables and the clinical and obstetric background. In relation to the six variables assessed in the univariate analysis, only the younger pregnant women and those who had never had a prenatal consultation showed a statistically significant association with maternal complications in the current pregnancy. To assess the independent effect of each of these variables and of other variables with $p < 0.20$ (number of abortions and morbidity), the Poisson regression model was adjusted so age and prenatal care continued significant. The non-occurrence of morbidity prior to pregnancy was also added.



Graph 1 - Pregnancy complications in women aged 35 years or older at a reference hospital. Pernambuco, 2013

Source: Research data, 2013.

Table 2 - Pregnancy complications in women aged 35 or older according to sociodemographic variable, clinical and obstetric background at a reference hospital. Pernambuco, 2013

Specification of the Results / Variables	Sample n = 430*	Pregnancy complications				
		n (%)	Crude PR (CI 95%)	p value**	Adjusted PR (CI 95%)	p value**
Age of mothers (years)				0.029		**0.020**
35 to 39	315	254(80.6)	1.16 (1.01 - 1.32)		1.17 (1.02 - 1.34)	
40 and older	115	80(69.6)	1		1	
Years of formal education				0.436		
< 3	73	54(74.0)	1			
4 to 11	257	205(79.7)	1.07 (0.92 - 1.25)			
12 or more	90	67(74.4)	1.00 (0.83 - 1.20)			
Parity				0.893		
None	109	85(78.0)	1.02 (0.90 - 1.16)			
1	136	107(78.7)	1.03 (0.91 - 1.16)			
2 or more	183	140(76.5)	1			
Abortion				0.152		0.248
None	273	208(76.2)	1		1	
1	104	80(76.9)	1.00 (0.89 - 1.14)		1.00 (1.04 - 1.40)	
2 or more	51	44(86.3)	1.13 (0.99 - 1.28)		1.12 (0.98 - 1.28)	
No. of prenatal consultations				0.037		**0.023**
None	27	24(88.9)	1.20 (1.03 - 1.41)		1.21 (1.04 - 1.40)	
1 to 5	166	135(81.3)	1.10 (0.99 - 1.23)		1.11 (0.99 - 1.24)	
6 or more	216	159(73.6)	1		1	
Comorbidity				0.073		**0.020**
Yes	140	101(72.1)	1		1	
No	290	233(80.3)	1.11 (0.98 - 1.25)		1.16 (1.02 - 1.30)	

Source: Research data, 2013.

* The sample varied due to lack of information; ** Poisson.

When the variable "pregnancy complications" was analysed as being the explanatory variable for premature birth ($p < 0.001$) and Caesarean section ($p = 0.002$) (Table 3), they were both significantly significant.

Table 3 - Frequency distribution of pregnancy complications in women aged 35 or older according to premature birth and type of delivery at a reference hospital. Pernambuco, 2013

Pregnancy complications	Premature birth		p value*
	Yes n (%)	No n (%)	< 0.001
Yes	133 (43.2)	175 (56.8)	
No	19 (19.8)	77 (80.2)	
Pregnancy complications	**Type of delivery**		**p value***
	Caesarean section n (%)	**Normal n (%)**	0.002
Yes	158 (51.3)	150 (48.7)	
No	32 (33.3)	64 (66.7)	

Source: Research data, 2013.
* Chi-squared test.

DISCUSSION

In this study, 73.4% of the pregnant women were between the ages of 35 and 39, while 26.6% were 40 years old or older. The characterisation of this sample differs from that of other research[6, 8]. In a study conducted in a prenatal unit in the city of Divinópolis - MG, 5.8% of the patients referred to high-risk prenatal care were between the ages of 14 and 19, 40.4% were between 20 and 29, 46.2% were between 30 and 39, and 7.7% were 40 years old or more[8]. Similarly, a study conducted in 359 health units in 29 countries of Africa, Asia, Latin America, and the Middle East to assess the association between advanced maternal age and adverse outcomes of pregnancy found a higher prevalence in women aged between 35 and 39 years, accounting for 9.5% of the sample, followed by 40 and 44 years, 2.3% of the sample, and only 0.5% in women 45 years old or more[9].

This finding is explained by the gradual decline in fertility up to the age of 35 followed by a sharper decline after this age. As the age advances, the likelihood of structural defects in the ova and the frequency of chronic disease also increases, and as the age of the pregnant woman increases, the reproductive history gets progressively more complicated[5].

Younger women (35 to 39 years) have a greater frequency of complications in pregnancy compared to women aged 40 years or more. Younger women are possibly experiencing their first pregnancy, starting prenatal care late and not taking the necessary precautions during pregnancy. An integrative literature review revealed that women who plan on getting pregnant late feel mature enough and financially and psychologically prepared to conceive. It also revealed that they are hopeful the pregnancy will have a favourable outcome. According to the review, age itself may not be a risk factor since prenatal control and appropriate care during labour and delivery have similar maternal and perinatal prognoses to those of younger pregnant women[4].

In relation to the factors associated with complications, the variable years of schooling was not a protection or risk factor for pregnancy complications. However, a meta-analysis study with cross-sectional and cohort studies on the association between the mothers' education and birth weight concluded that education is the strongest economic predictor and will be one of the determinants of maternal-foetal health[7].

Of the evaluated pregnant women, 77.7% had suffered some kind of complication, which is a significant percentage that reinforces the association between advanced maternal age with a greater risk of complications in pregnancy. According to a study conducted with 8.5 million single birth records in Brazilian hospitals in the period 2004-2009, older mothers are under a greater risk of adverse perinatal outcomes; however, these outcomes are minimised or eliminated depending on gestational age, parity and, in particular, maternal schooling[10].

The most frequent complications observed were pregnancy-specific hypertensive syndromes, especially preeclampsia, gestational diabetes, and premature rupture of membranes. This result is found in several other studies[1,3,6]. According to one of these studies, hypertension is the most common complication found in pregnancy, occurring mainly in women of advanced age, and when chronic, it is two to four times more likely to occur in pregnant women aged 35 or over than in women aged betwe-

en 30 and 34[1]. The authors attribute the higher prevalence of chronic hypertension to vascular compromise with age, which can increase the susceptibility of those mothers to pregnancy-specific hypertension even if hypertension is not clinically recognised[1,11].

In this study, gestational diabetes was the second most frequent complication and accounts for 17% of the complications that occurred among the studied patients. Studies show that pre-existing gestational diabetes is three to six times more common in women over 40 than in women between 20 and 29 years of age. The incidence in the overall obstetric population is 3% and studies reveal that gestational diabetes mellitus values range from 4% to 17% among pregnant women aged 35 or more, which corroborates the current findings[1].

The premature rupture of membranes (PROM) is observed in around 10% of all pregnancies, most of which are term, and 2% to 3% of preterm pregnancies. The genesis of PROM is based on multiple factors and mostly unknown causes. Some of the predisposing factors are smoking, vitamin deficiencies, urinary tract infections, and history of PROM in earlier gestation[12]. A study to analyse the profile of patients with premature PROM reveals that 40.5% of the patients were between 31 and 44 years of age[13].

As for parity, there was no significance for complications in pregnancy. According to some studies, however, multiparity is associated with increased maternal and neonatal risk[14], and nulliparous women over 40 are at greater risk of complications, such as lower birth weight and shorter gestational age than those who have already had children[11].

Although history of abortion was not significant in this study, it can lead to obstetric complications, such as abnormal insertion of the placenta, premature births, abortion, and others. Of all the clinically recognised pregnancies, 15% to 20% end in miscarriage, especially during the first 13 weeks of pregnancy. According to another study, the percentage of miscarriages increases with maternal age, ranging between 9% and 17% in pregnant women aged 20 to 30 and 80% in women aged 45 or more[15].

One relevant finding with the number of prenatal consultations. Of the evaluated women, 52.8% had six or more consultations. This result was incompatible with the results in other studies. In one of these studies, 79.4% of the women with late pregnancies had 6 or more prenatal appointments[16]. In another study, in which 29% of patients were 30 years old or more, 87% of the pregnant women had 6 or more prenatal consultations[17].

This data causes concern, as in addition to their advanced age, pregnant women who do not have prenatal care have an increased risk of maternal complications. A study showed that the reasons for starting prenatal care late in the pregnancy vary according to the characteristics of these women. Some of the reasons mentioned are personal problems, unwanted pregnancy and late diagnosis of pregnancy, among other reasons[16].

The women who had a comorbidity prior to pregnancy had a lower frequency of maternal complications, which is surprising since studies found that age-related diseases are determining factors for the occurrence of adverse effects in these women[5-6]. The pregnant women who had some pre-existing condition were probably in treatment and needed greater care and attention, so they were more eager to attend prenatal consultations. In contrast, the lower number of consultations, in general, may reflect difficulties in getting care[16].

In this study, pregnancy complications were associated with premature birth and Caesarean section, corroborating the findings of other studies. According to one such study, the rate of Caesarean section was 38.3%, with the significant influence of gestational risk (57.8% in high-risk pregnancies) and premature birth and low birth weight were more frequent in Caesarean section deliveries[18].

In a retrospective study conducted with 18,009 records of the SINASC on the rates of Caesarean section, specifically among women older than 35, the risk of Caesarean section was 1.68 times higher in these women than in women aged between 20 and 34. The reasons for the greater incidence of this type of intervention in women of advanced maternal age are many and include diseases, obstetrical indication, and foetal complications. The deterioration of the myometrium with age can also cause some delivery-related complication[6].

In view of these data, it can be concluded that the results of this study were expected since, in addition to the advanced age of these women and the high rate of premature births and Caesarean section, complications such as premature rupture of the membranes, placenta previa, gestational hypertension, twin pregnancy, and gestational diabetes can demand the premature interruption of pregnancies, which increases the incidence of surgical births[5-6]. Moreover, the function of the myometrium deteriorates with age, which can cause some delivery-related complications and increase the incidence of Caesarean section[5].

CONCLUSION

Most of the pregnant women evaluated in the study were between 35 and 39 years old, were not originally from Recife, had brown skin, were married or in a consensual union, had 4 to 11 years of schooling, had given birth more than twice, had not suffered a miscarriage, and had no comorbidities prior to pregnancy.

The research shows that more than 70% of these women had some sort of complication, especially preeclamp-

sia, gestational diabetes, gestational hypertension, and premature rupture of membranes. Some of the factors that could have influenced this result, such as low educational level and parity, were not significant.

As for the variables associated with complications in pregnancy, lack of prenatal care was expected; however, younger age (35 to 39 years) and the absence of comorbidities may suggest that older women and those with previous diseases are more concerned with their health. With regard to the influence of pre-existing diseases in pregnancy complications, these complications were surprisingly more frequent among the women with no comorbidities.

The presence of some kind of complication in pregnancy was predictive for the higher incidence of premature birth and Caesarean section.

Consequently, maternal age is considered relevant given its high incidence, although most of the women had a relatively good educational level, received prenatal care, and did not have comorbidities. Age, however, cannot be considered an isolated factor for maternal and obstetrical complications and more studies are needed to identify the influence of pre-existing conditions and parity on complications in pregnancy. The exiguous knowledge of the effects of pre-existing conditions in the studied women and their gynaecological-obstetric history can be considered a limitation of this study.

In view of these results, health workers must acquire knowledge on the implications of late pregnancy not only provide guidance and minimise the risks but also to provide preconception counselling on the risk and benefits for those who wish to become pregnant.

In this scenario, nurses play a critical role, from primary care to the Family Health Strategy, in reducing maternal morbidity and mortality, and in high-complexity services, with their expertise and contributions in various areas of healthcare, such as education, research, service, and management.

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Received: 03.09.2017
Approved: 07.27.2017