● **Original article**

PROFILE OF CARDIAC PREGNANT WOMEN: HIGH-RISK

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ABSTRACT: Objective: To characterize cardiac pregnant women with high-risk pregnancies assisted in a secondary healthcare unit at the Third Regional Health Center of the state of Paraná, Brazil. **Methods:** Quantitative, documentary and retrospective study carried out from July to August 2016. The investigation used secondary data from health indicators originated at the Campos Gerais High-Risk Pregnancy Clinic. The database search was restricted to the period between October 2013 and June 2016. Sixty medical records of cardiac pregnant women were analyzed using two variables: cardiac diagnosis, and sociodemographic factors and obstetric antecedents. **Results:** The most common cardiac diagnosis was cardiac arrhythmia and the prevalent cardiovascular risk factor was systemic arterial hypertension. The profile of patients assisted in this unit was a woman from the Castro municipality, 26.4 years old on the average, married, with complete primary school and multigravida. **Conclusion:** The main cardiac diagnosis among the examined women was cardiac arrhythmia, which increases cesarean indexes and makes the work of nurses in prenatal care fundamental to minimize possible complications.
DESCRIPTORS: High-risk pregnancy; Pregnant women; Heart diseases; Nursing; Prenatal care.

PERFIL DE GESTANTES CARDIOPATAS: ALTO RISCO

RESUMO: Objetivo: caracterizar as gestantes cardiopatas com alto risco gestacional atendidas no setor secundário pela 3ª regional de saúde do Paraná. **Método:** pesquisa quantitativa, documental eretrospectiva,realizada entre julho e agosto de 2016. O estudo apropriou-se de dados secundários, de indicadores de saúde advindos do Ambulatório de Alto Risco Gestacional dos Campos Gerais. O banco de dados compreendeu outubro de 2013 a junho de 2016, sendo analisados 60 prontuários de gestantes cardiopatas, utilizando para tal as variáveis: diagnóstico cardíaco, e fatores sociodemográficos e antecedentes obstétricos. **Resultados:** predominou-se a arritmia cardíaca como diagnóstico encontrado nos prontuários, a Hipertensão Arterial Sistêmica como fator de risco cardiovascular, pacientes procedentesda cidade de Castro, com idade média de 26,4 anos, casadas,com ensino fundamental completo e multigestas. **Conclusão:** conclui-se que estas gestantes apresentaram a arritmia cardíaca como principal diagnóstico. Issoeleva os índices de cesariana, sendo primordial a atuação do enfermeiro no pré-natal para minimizar possíveis complicações.
DESCRITORES: Gravidez de alto risco; Gestantes; Cardiopatias; Enfermagem; Cuidado pré-natal.

PERFIL DE EMBARAZADAS CON CARDIOPATÍAS: ALTO RIESGO

RESUMEN: Objetivo: Caracterizar a embarazadas con cardiopatías de alto riesgo gestacional atendidas en sector secundario de 3ª regional de salud de Paraná. **Método:** Investigación cuantitativa, documental, retrospectiva, realizada de julio a agosto de 2016. El estudio tomó datos secundarios, de indicadores de salud del Servicio del Servicio de Alto Riesgo Gestacional de Campos Gerais. Banco de datos desde octubre de 2013 hasta junio de 2016. Fueron analizadas 60 historias clínicas de embarazadas con cardiopatías, utilizándose las variables: diagnóstico cardíaco, factores sociodemográficos y antecedentes obstétricos. **Resultados:** La arritmia cardíaca fue el diagnóstico predominante en las historias clínicas, la Hipertensión Arterial Sistémica como factor de riesgo cardiovascular, pacientes de la ciudad de Castro, media etaria de 26,4 años, casadas, con enseñanza primaria completa y no primerizas. **Conclusión**: Estas embarazadas presentaron arritmia cardíaca como principal diagnóstico. Esto incrementa los índices de cesáreas, resultando primordial la actuación del enfermero en el prenatal para minimizar complicaciones.
Descriptores: Embarazo de Alto Riesgo; Mujeres Embarazadas; Cardiopatías; Enfermería; Atención Prenatal.

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● **INTRODUCTION**

Pregnancy is characterized by physiological changes that occur in the maternal body. These adaptations affect the reproductive system and some organs from other systems. Cardiac alterations are among the most important and are marked by physiological overload of the maternal heart. The increase in blood circulation is necessary to supply nutrients and oxygen to the embryo or fetus and meet the demands of the maternal body[1].

The hemodynamic variations which happen in the maternal organism lead to an increase in the blood volume, and in the heart output and rate. This growth in cardiac overload increases the chances of complications in cardiac pregnant women, and extends over the perinatal period, childbirth and postpartum phase. Given these physiological demands on the heart, cardiac pregnant women are expected to face a significant risk of complication during pregnancy[1-2].

According to the risk stratification from the Rede Mãe Paranaense guidelines, cardiac pregnant women who have pre-existing clinical conditions are classified as having a high-risk pregnancy, and consequently are more likely to develop complications during pregnancy and childbirth. These patients need a specialized service, with multidisciplinary teams familiar with high-risk pregnancies to provide care until delivery[1,3].

The Guideline for Cardiac Pregnant Women of the Brazilian Cardiology Society claims that heart diseases are considered the main cause of indirect maternal death in the pregnancy-postpartum cycle, despite its low incidence (4.2% of pregnancies in the country)[4]. This context reveals the importance of specialized and multidisciplinary care, in which nursing teams play a relevant, if not crucial role in the approach of cardiac pregnant women[5].

Among the main etiologies of pregnancy heart conditions, the most frequent is rheumatic disease, associated with 50% of the cases. Despite less common, congenital heart diseases, cardiomyopathies, arrhythmias, coronary artery disease and hypertrophic cardiomyopathy also figure among pregnancy-related heart illnesses[2,6].

The objective of the present study was to characterize cardiac women with high-risk pregnancy assisted in a secondary healthcare unit at the Third Regional Health Center of Paraná.

● **METHODS**

The present investigation was retrospective and quantitative, and was designed to describe the characteristics of a population through the documentary evaluation of variables with numerical emphasis[7].

Health indicators of cardiac pregnant women from 11 municipalities of the region of Campos Gerais, which belongs to the coverage area of the Third Regional Health Center of the state of Paraná, Brazil, were analyzed. These women were assisted in the High-Risk Pregnancy Clinic, a secondary healthcare unit which provides high-risk pregnant women with care.

The inclusion criterion was cardiac pregnant women who were assisted in the High-Risk Pregnancy Clinic, and the exclusion criterion was to present a pregnancy risk other than a heart-related problem.

The search in the database was limited to the period from October 2013 to June 2016 and based on health indicators. Sixty medical records of cardiac pregnant women who were assisted in the High-Risk Pregnancy Clinic were chosen. During selection, carried out in July and August 2016, the following variables were examined: heart diagnosis, age, gestational age at the first appointment at the clinic, municipality of origin, obstetric antecedents, number of appointments with the obstetric nurse of the clinic, skin color, marital status, level of education and other risk factors associated with heart diseases.

Data were organized in Microsoft Excel worksheets and examined with descriptive statistics, through frequency analysis, to verify the general characteristics of the sample and of the different risks. Calculations were run with the Statistical Package for the Social Sciences (SPSS) version 17.0 software.

The proposal was approved as per report 1.055.927 issued by the Research Ethics Committee of the Ponta Grossa State University. The study met national and international ethical requirements for human research.

● RESULTS

Sociodemographic information in the medical records revealed that 41 (68.3%) cardiac pregnant women were between 20 and 34 years old, 11 (18.3%) were 19 years old or younger, and eight (13.3%) were 35 years old or older. The average age was 26.4 years.

Regarding marital status, 32 (53.3%) of the patients were married or in a stable union. As for employment relationship, the results were similar to those observed for the first variable: 32 (53.3%) pregnant women were self-employed, unemployed or in an informal work situation. Thirty-four (56.67%) women completed primary school.

The most common municipality of origin was Castro, which referred 24 (40%) pregnant women to the High-Risk Pregnancy Clinic, followed by Arapoti, with eight (13.33%) referrals, and Carambeí, with seven (11.67%) referrals. Other municipalities were mentioned in the examined records, with a lower frequency but the same relevance given the high-risk pregnancy. Some of these municipalities were Jaguariaíva, with six (10%) patients; Palmeira, with five (8.33%); Sengés, with three (5%); Piraí do Sul, Ivaí and São João do Triunfo, with two (3.34%); and Ipiranga, with one (1.67%) referred pregnant woman. It was found that 51 (85%) patients were white, seven (11.67%) were brown and two (3.33%) were black. These results are shown in Table 1.

Table 1 – Sociodemographic characteristics of cardiac pregnant women. Ponta Grossa, PR, Brazil, 2016. (continues)

Variables	N	%
Age		
≤ 19 years	11	18.33
20 - 34 years	41	68.33
≥ 35 years	08	13.33
Marital status		
Married	32	53.33
Single	28	46.67
Formal employment		
No	32	53.33
Yes	28	46.67
Level of education		
Primary school	34	56.67
High school	20	33.33
Higher education	06	10
Municipality of origin		
Castro	24	40
Arapoti	08	13.33
Carambeí	07	11.67
Other	21	35

Skin color		
White	51	85
Black	02	03.33
Brown	07	11.67
Total	**60**	**100**

Source: High-risk Pregnancy Clinic health indicators, CEPP Project, Ponta Grossa State University.

In addition to socioeconomic characteristics, the obstetric profile of the sample was examined. Five (8.33%) women were in the first trimester of the pregnancy when they had their first appointment in the studied unit.

Regarding the number of prenatal appointments with the obstetric nurse, in addition to a specialized medical appointment, it was observed that 12 (20%) patients attended six appointments, and seven (11.6%) pregnant women had only one appointment. As for the number of pregnancies, 35 (58.33%) were multigravida.

The results allowed to evaluate if the cardiac pregnant women presented at least one risk factor related to the current heart disease. Data showed that 32 (53.33%) patients had no risk factors, and nine (15.02%) presented high systemic arterial hypertension associated with another risk factor: obesity, preeclampsia, overweight, smoking, and diabetes mellitus.

Other relevant aspects found in the medical records but present at a low frequency were: overweight in three (5%) pregnant women, smoking in two (3.3%), obesity associated with smoking in one (1.6%), eclampsia in one (1.6%) and vascular disease in one (1.6%). Table 2 exhibits more information about the obstetric profile of the studied women.

Table 2 – Obstetric characteristics detected during prenatal care. Ponta Grossa, PR, Brazil, 2016.

Variables	Number of pregnant women	%
Gestational age		
1st trimester	05	08.33
2nd trimester	33	55
3rd trimester	22	36.67
Number of appointments		
> 6	05	08.33
6	12	20
5	10	16.67
4	05	08.33
3	12	20
2	09	15
1	07	11.67
Obstetric history		
Primigravida	25	41.67
Multigravida	35	58.39
Cardiovascular risk factor		
None	32	53.33
Arterial hypertension	06	10
Associated arterial hypertension	09	15
Other	13	21.68
Total	**60**	**100**

Source: High-risk Pregnancy Clinic health indicators, CEPP Project, Ponta Grossa State University.

It is noteworthy that 17 (28.3%) cardiac pregnant women presented some type of cardiac arrhythmia, the most common one being sinus tachycardia, followed by sinus bradycardia. Table 3 lists the prevalent cardiopathies identified in the examined medical records.

Table 3 – Main gestational cardiopathies. Ponta Grossa, PR, Brazil, 2016.

Cardiopathy	Number of pregnant women	%
Cardiac arrhythmia	17	28.30
Heart murmur	09	15
Mitral valve prolapse	07	11.67
Hypertrophic cardiomyopathy	07	11.67
Mitral valve insufficiency	03	5
Interventricular communication	02	3.33
Rheumatic disease	02	3.33
Atrial dilatation	02	3.33
Other	11	18.33
Total	**60**	**100**

Source: High-risk Pregnancy Clinic health indicators, CEPP Project, Ponta Grossa State University.

In addition to the pregnancy cardiopathies mentioned in Table 3, other heart diagnoses were found in the records, although with a lower frequency, totaling 11 (18.3%) patients. The heart problems affecting one (1.6%) pregnant women were intraventricular septal aneurysm, aortic insufficiency associated with aortic stenosis, congenital aortic valve insufficiency, tricuspid valve insufficiency associated with mitral stenosis, mitral valve insufficiency associated with stenosis, ischemic cardiomyopathy, patent ductus arteriosus, left ventricular overload and mitral valve disease.

● **DISCUSSION**

Regarding sociodemographic variables, it was found that there was a prevalence of women of childbearing age, from 20 to 34 years old, a range compatible with that advocated by the Ministry of Health[8]. This result indicates that most of the sample did not fit the age groups associated with a high-risk pregnancy (younger than 18 years old and older than 35 years old). An investigation[2] oriented to assess the quality of life of 42 cardiac pregnant women also reported a predominant age group between 22 and 36 years.

As for marital status, 32 (53.3%) of the women were married or in a stable union. A study carried out in the Brazilian state of Paraná pointed that 52.5% of women with a high-risk pregnancy were married. It is known that marital status is an important aspect in the analysis of maternal health, because the presence of a partner brings psychological advantages to pregnant women by offering emotional security, in addition to decreasing the chances of financial issues when the baby is born[10].

Data also demonstrated that most examined women did not have a formal job. A similar study[2] reported that 54.8% of the pregnant women had a formal professional activity, but 26.2% were not practicing the profession, in an indication of concordance between this finding and that revealed in the present study.

In this socioeconomic context, it is important to emphasize the financial family dependence, which impacts the quality of life that mothers can offer to both their children and themselves[2].

Concerning the level of education of the sample, 34 (56.67%) medical records mentioned primary school. An investigation oriented to evaluate the profile of high-risk pregnancies assisted in an obstetric center of the state of Santa Catarina showed that 48.4% of the women had complete or incomplete primary school, disclosing a high rate of pregnant women with few years of education. It is possible to speculate whether the low level of education of women is related to the high rate of informal work, as assumed in a previous investigation[11].

Another important factor to be considered in this regard is that few years of education can be considered a risk factor for developing health problems, because a limited access to information impairs the understanding of health care. In this case, it means to ignore measures to control pregnancy-related heart conditions and prevent complications deriving from them[8].

Analysis of the skin color variable revealed a prevalence of white women. This result corroborates the findings described in another investigation[9], which reported a share of 62.3% of white women in the sample. According to the guideline, black women have a higher pregnancy-related risk factor in comparison with Caucasian women[3]. The prevalence of white women in the present study may be related to a predominant European settlement in the south of the state of Paraná[12].

As for the obstetric profile of the sample, it was found that most women had their first appointment in the High-risk Pregnancy Clinic in the second trimester. The third trimester was in second place, followed by the first trimester. These data are compatible with the results of a study carried out in Fortaleza, state of Ceará, according to which 43.8% (n=32) of the examined women started prenatal care in the second trimester of pregnancy.

The objective of prenatal is to monitor the health condition of mothers and fetuses. Thus, it is crucial that pregnant women start a prenatal follow-up as soon as the pregnancy is confirmed or before the first trimester of pregnancy is over, in accordance with the advocated ten steps for a high-quality prenatal care at a primary healthcare unit through early recruitment[13].

The Brazilian Ministry of Health[13] stresses the need for early recruitment of pregnant women, to assist them since the beginning of the pregnancy, hence ensuring the birth of a healthy child and the well-being of mothers and babies.

A study[14] revealed that 60% of the pregnant women start prenatal care too late, after the 12th week of pregnancy, although the country provides a nearly comprehensive care. The investigation also pointed out that one-fourth of these pregnant women do not attend the minimum number of six appointments recommended by the Ministry of Health.

The findings of the present study may be explained by the delay of pregnant women to visit primary healthcare services to start prenatal care. When a cardiopathy is diagnosed, and causes the pregnancy risk to increase, primary healthcare professionals classify the disease and refer patients to a secondary health care center.

Regarding the number of nursing appointments at the High-risk Pregnancy Clinic, the numbers of pregnant women who had three and six appointments were equal. According to the Rede Mãe Paranaense guideline, pregnant women have to attend at least seven appointments during prenatal care. Therefore, data gathered in the present study show that the frequency at which women are present at appointments at the clinic was lower than that advocated[3].

Low adherence to nursing appointments may be explained by the fact that prenatal care occurs at secondary healthcare units. The care provided in these centers stabilizes the clinical condition of these women, making them go back to an intermediate risk level until the end of pregnancy, which causes patients not to return to the High-risk Pregnancy Clinic.

It is necessary to stress the importance of nursing care during nursing appointments in high-risk prenatal. In this circumstance, nurses must emphasize prevention of complications involving both mother and child, encourage pregnant women to execute self-care by promoting health education to

clarify questions, and guide patients[5]. However, it is pertinent to highlight the importance of nurses in the care provided to the community to improve the quality of life by applying good care practices[2].

Multigravida women were more numerous than primigravida patients. Another study showed a similar result: 33 (78.9%) cardiac pregnant women were multigravida. This is an evidence that cardiopathies were not a determining factor in family planning for these women. Data also revealed that most patients did not present cardiovascular risk factors, but systemic arterial hypertension was the main risk factor associated with cardiopathies. It was identified in association with other factors, such as obesity, overweight, diabetes and smoking, and then pointed as the only risk factor associated with cardiopathies.

According to the Brazilian Cardiology Society, pregnant women with cardiopathies associated with systemic arterial pressure are considered prone to develop complications, mainly those patients who had heart problems before getting pregnant. These cases require a special treatment and follow-up to prevent heart complications caused by changes in arterial pressure[4].

In addition to systemic arterial pressure, other cardiovascular risk factors were found in medical records, by themselves or associated with that disease. The most common ones were obesity and overweight, indicating a high rate of pregnant women with weight issues. An investigation addressed the influence of the maternal nutritional state, weight gain, and energy consumption on fetal growth in high-risk pregnancies, and concluded that there is a correlation between the maternal nutritional state and the presence of abnormal fetal growth[15].

Consequently, newborns whose mothers were diagnosed with systemic arterial pressure were likely to be small for gestational age, and newborns whose mothers developed obesity were prone to be large for gestational age. These outcomes exemplify the importance of prenatal care and health education throughout pregnancy, with a direct action by nurses[15].

Regarding heart diagnosis, cardiac arrhythmia was the main problem among the women in the sample. This set of heart abnormalities can induce a cesarean section in 85.7% of births in cardiac pregnant women, and this high rate also prevails in other cardiopathies[1].

According to the Brazilian Cardiology Society guideline for Pregnancy in Cardiac Women[4], the physiological and hormonal alterations that happen naturally during pregnancy can favor the development of arrhythmias. Most of them are benign, but in 6% of the cases they may lead to complications and increase the chances of adverse effects for both the mother, for instance stroke, and the fetus, such as prematurity[4].

Heart murmur was the second most frequent diagnosis in the sample. This condition is characterized by an extra sound resulting from turbulent blood flow, which originates a vibration that can be detected during cardiac auscultation, especially in patients who present congenital heart alterations, such as those which lead to an abnormal valve structure, hypertrophy or dilatation of the cardiac cavity and regurgitation of blood flow in incompetent valves[16].

Mitral valve prolapse was the third most prevalent diagnosis in the examined medical records. It consists of the displacement of valve leaflets to the left atrium, and may be transmitted genetically[4]. Hypertrophic cardiomyopathy was also among the most common heart conditions in the present study. It is a hereditary disease, characterized by hypertrophy or dilatation of the muscle cells from the left ventricle. Most cardiac women have a favorable prognosis during pregnancy, but complications may occur[4].

The main obstetric complications that pregnancy-related cardiopathies can provoke are vaginal bleeding and abdominal wall hematoma. The most common clinical complications are extrauterine infections, such as those in airways, acute pulmonary edema, cardiogenic shock, pulmonary thromboembolism, infective endocarditis, acute arterial occlusion and, less often, maternal death[1].

It is necessary to emphasize the importance of nursing care during high-risk prenatal follow-up, in both outpatient and hospital settings, given that the role of nursing professionals includes teaching, promoting care, performing nursing processes and evaluating their outcomes[5]. An investigation showed that 90% of pregnant women receive orientations from nurses during high-risk prenatal care[14].

The work of nurses in primary health care also has to be emphasized. These professionals provide pregnant women with the necessary care, promote health education, help carry out risk stratification and offer humanized care, demanding the same from the other members of the multidisciplinary team[17].

The main limitation of the present study is the fact that comparisons between its results and those from other investigations must be made with caution, given that research involving cardiac pregnant women concentrate on the north and northeast regions of Brazil and regional specificities may hinder the establishment of proper analogies.

● **CONCLUSION**

Analysis of data collected from medical records revealed that cardiac pregnant women present cardiac arrhythmia as the main heart diagnosis during pregnancy. This is a relevant gestational diagnosis, because arrhythmias increase cesarean section rates.

Last, it is fundamental to stress the role played by nursing professionals. They are members of the prenatal care multiprofessional team and act on primary, secondary and tertiary care. They are expected to have a proactive, evidence-based attitude in care, nursing process and health education regarding pregnancy, whether it is a low, intermediate or high risk one. New investigations about pregnancy in cardiac women and the work of nursing professionals in high-risk prenatal care are necessary.

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