JHPHS
Journal of Hospital Pharmacy and Health Services

Original Paper

Open Access

Profile of high-risk pregnant women and prescription of medications during prenatal care, hospitalization for childbirth and postpartum

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Submitted: 15-04-2025 Resubmitted: 25-07-2025 Accepted: 24-08-2025

Double blind peer review

Abstract

Objective: To describe the clinical, sociodemographic and medication use profile of high-risk pregnant women followed during prenatal care, hospitalization for delivery, and immediate postpartum. **Methods:** This is a descriptive, retrospective, cross-sectional study, covering high-risk pregnant women at a high-risk prenatal clinic between September 2021 and March 2022. The data collected included age, clinical and reproductive history, use of medications, tobacco, alcohol, or illicit drugs during pregnancy, delivery, and postpartum, clinical complications, and hospitalization during pregnancy, and analyzing them through descriptive statistics. **Results:** We analyzed 312 pregnant women, with a mean age of 25.6 years (SD = 7.9), elementary to incomplete high school (61.5%), multigravida (58%), unplanned pregnancy (69.2%) and previous psychiatric disorder (17.9%). The majority (80%) presented clinical complications during pregnancy, with gestational diabetes being prevalent (37.8%). During prenatal care, 22.8% required hospitalization due to preeclampsia (5.1%), glycemic control (4.8%), and pyelonephritis (3.5%). All women used medicines during pregnancy; excluding folic acid and ferrous sulfate, the percentage was 96.1%. On average, 9.25 medicines (SD=6.06) were prescribed during prenatal care, 11.06 (SD=4.01) during hospitalization, and 8.98 (SD=3.2) during the postpartum period. The most prescribed medicines during prenatal care were ferrous sulfate and NPH insulin; during hospitalization for delivery, oxytocin and dipyrone; and during the postpartum period, metoclopramide and acetaminophen. **Conclusions:** The high use of medicines may be related to health conditions of pregnant women, which, if left untreated, pose risks to the mother and fetus. The treatments used are following the literature.

Keywords: Prenatal Care, High-Risk Pregnancy, Maternal and Child Health, Drug Prescriptions, Drug Utilization.

Perfil de gestantes de alto risco e prescrição de medicamentos no pré-natal, internação para o parto e pós-parto

Resumo

Objetivo: Descrever o perfil clínico, sociodemográfico e de utilização de medicamentos por gestantes de alto risco acompanhadas no pré-natal, internação hospitalar para o parto e pós-parto imediato. **Métodos:** Estudo descritivo, retrospectivo, transversal com gestantes de alto risco atendidas em um hospital materno infantil, entre setembro de 2021 e março de 2022. Dados coletados incluíram idade, histórico clínico e reprodutivo, uso de medicamentos, tabaco, álcool ou drogas ilícitas na gestação, parto e pós-parto, complicações clínicas e internação hospitalar durante a gestação, analisados por meio de estatística descritiva. **Resultados:** Foram analisadas 312 gestantes, com média de 25,6 anos (DP=7,9), ensino fundamental ou médio incompleto (61,5%), multigestas (58%), gravidez não planejada (69,2%) e transtorno psiquiátrico (17,9%) prévio. Complicações clínicas ocorreram em 80% das gestantes, sendo o diabetes gestacional a mais prevalente (37,8%). Durante o pré-natal, 22,8% necessitaram de internação por pré-eclâmpsia (5,1%), controle glicêmico (4,8%) e pielonefrite (3,5%). Todas as mulheres receberam prescrição de medicamentos no pré-natal; com exceção de ácido fólico e sulfato ferroso, o percentual foi de 96,1%. Em média, foram prescritos 9,25 medicamentos (DP=6,06) no pré-natal, 11,06 (DP=4,01) na internação e 8,98 (DP=3,2) no puerpério. Os medicamentos mais prescritos foram sulfato ferroso e insulina NPH no pré-natal; ocitocina e dipirona na internação para o parto; e metoclopramida e paracetamol no puerpério. **Conclusões:** O elevado uso de medicamentos pode estar relacionado às condições de saúde das gestantes que, se não tratadas, representam riscos para a mãe e feto. Os tratamentos utilizados estão de acordo com a literatura.

Palavras-chave: Cuidado Pré-Natal, Gravidez de Alto Risco, Saúde Materno-Infantil, Prescrições de Medicamentos, Uso de Medicamentos.

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Introduction

In Brazil, approximately 15% of pregnancies are classified as high-risk.[1] This condition may be determined by individual characteristics of the woman, sociodemographic factors, pre-existing clinical conditions, a history of reproductive complications in previous pregnancies, and clinical or obstetric complications in the current pregnancy. Such factors significantly increase risks to maternal and fetal health, making specialized prenatal care indispensable. This care is essential to prevent adverse outcomes such as preterm birth, low birth weight, and maternal and neonatal mortality.[1,2]

The use of medicines during pregnancy is common,[3,6] usually associated with the treatment of chronic conditions that predate pregnancy and the management of clinical manifestations inherent to gestation. In addition, prophylactic supplementation with folic acid and iron is recommended in order to prevent neural tube defects and iron-deficiency anemia.[7] Medicines use may occur through medical prescription and/or self-medicine,[8,9] the latter often related to unawareness of pregnancy, especially in cases of unplanned conception.[10] During hospitalization for delivery and the postpartum period, medicines are primarily used for labor induction, pain management, and the treatment of infections or chronic diseases of the mother.[11,12]

Several drugs are capable of crossing the placental barrier and reaching the fetal circulation, which may pose significant risks to embryofetal development. These risks vary according to the type of medicine, the administered dose, and the gestational period, with the first trimester generally being the most critical for the occurrence of congenital malformations. Therefore, medicine prescribing during pregnancy should be carefully based on an assessment of the risk-benefit ratio.[13] Certain therapeutic classes, such as angiotensin-converting enzyme inhibitors, anticonvulsants with recognized teratogenic potential, and coumarin anticoagulants, are associated with congenital malformations, fetal toxicity, and adverse neonatal outcomes.[13] In this context, early and adequate prenatal care, carried out by a multidisciplinary team, is essential for monitoring maternal and fetal health, optimizing pharmacotherapy, and providing safe guidance to pregnant women, thereby promoting more favorable outcomes.[1,2]

Most studies on medicine use in pregnant women focus on low-risk pregnancies, without considering pharmacotherapy throughout the entire gestation, hospitalization for delivery, and the immediate postpartum period. This gap is particularly relevant in the context of the Brazilian Unified Health System (SUS), where care specificities, disease burden, and sociodemographic heterogeneity may influence prescribing patterns. Thus, conducting studies that characterize the most prevalent clinical conditions and treatments adopted for these women is essential to provide support for the development of effective public health policies. Such policies are crucial for improving the quality of maternal and child care, with potential impact on reducing the rates of high-risk pregnancies and perinatal mortality.

Therefore, the present study aims to describe the clinical, sociodemographic, and prescription profiles of high-risk pregnant women monitored during prenatal care, hospitalization for delivery, and the immediate postpartum period.

Methods

This is a cross-sectional study with pregnant women followed at the High-Risk Prenatal Care Outpatient Clinic (PNAR) who were hospitalized for childbirth and postpartum care at the Presidente Vargas Maternal and Child Hospital (HMIPV), in Porto Alegre, Brazil, between September 1, 2021, and March 31, 2022.

HMIPV provides emergency care for children and pregnant women, as well as inpatient services in neonatology, pediatrics, psychiatry, gynecology, obstetrics, and rooming-in. It has 188 inpatient beds covered by the Brazilian Unified Health System (SUS). The High-Risk Prenatal Care Outpatient Clinic provides care to pregnant women from all regions of Rio Grande do Sul in the following specialties: mental health, gestational diabetes, gestational hypertension, fetal medicine, pregnant women living with HIV, and medium-risk pregnancies.

For the selection of high-risk pregnant women (HRPW), a report of patients seen at PNAR during the study period was generated, totaling 495. From this group, those who completed both prenatal follow-up and delivery at HMIPV were included. Exclusion criteria were: women whose prenatal care was not carried out at PNAR (n=23), those reclassified as low-risk pregnancies during follow-up (n=9), transfer of prenatal care or hospital (n=14), women seen at PNAR only for consultations or examinations (n=46), loss to follow-up during prenatal care (n=41), and delivery performed in another hospital (n=50).

To describe the sociodemographic and clinical profile of high-risk pregnant women, the following data were extracted from the electronic medical records: medical record number, date of first PNAR visit, gestational age at first PNAR visit, maternal age, race/skin color (White, Black, Brown, Yellow), marital status (with or without partner), education level (incomplete elementary, complete elementary, incomplete secondary, complete secondary, incomplete higher education, complete higher education), occupation, municipality of residence, whether the pregnancy was planned (yes or no), alcohol, tobacco, or illicit drug use during pregnancy (yes or no), pre-existing health conditions, gestational history GPACE [number of previous pregnancies (G), vaginal deliveries (P), miscarriages (A), cesarean sections (C), and ectopic pregnancies (E)], health complications during pregnancy, need for hospitalization during pregnancy (reason and length of stay), and type of delivery in the current pregnancy (vaginal or cesarean). Occupations were classified according to the Brazilian Classification of Occupations (http://www.mtecbo.gov.br/cbosite/pages/home.jsf), with adaptations.

To analyze the profile medicine use, prescription data were collected for the prenatal period, delivery hospitalization (Obstetric Center), and postpartum period (Recovery Room and Rooming-in). The collected variables were: medicine, route of administration, prescription start and end dates. Medicine were classified according to the Anatomical Therapeutic Chemical (ATC) system (https://atcddd.fhi.no/atc_ddd_index/). For pregnancy risk classification, the systems of the U.S. Food and Drug Administration (FDA) (https://nctr-crs.fda.gov/) (categories A, B, C, D, and X) and the Australian Therapeutic Goods Administration (TGA) (https://www.tga.gov.au/) (categories A, B1, B2, B3, C, D, and X) were used, as described on their official websites and complemented with information from the drugs.com portal. Data on prescriptions during prenatal care were complemented with information from the Porto Alegre City Hall Drug Dispensing System (DIS) and the e-SUS System.

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Data collection took place between February and September 2023 by two researchers previously trained to standardize collection procedures, supported by an operations manual.

The sample size was estimated to provide the prevalence of medicine use during pregnancy. Considering an estimated 600 pregnant women receiving prenatal care per semester, a frequency of medicine use during pregnancy of around 90%, and a 95% confidence level, the minimum required sample size was 113 pregnant women. The calculation was performed using the OpenEpi program (https://openepi.com/Menu/OE_Menu.htm).

Data were analyzed using descriptive statistics with IBM SPSS Statistics version 18. Categorical variables were described as frequencies, and continuous variables were described as mean and standard deviation.

The study was approved by the Research Ethics Committee of HMIPV, under CAAE number 46447821.7.0000.5329 (approval no. 4.716.657, dated May 17, 2021).

Results

A total of 312 high-risk pregnant women (HRPW) who underwent prenatal care, delivery, and postpartum care at HMIPV were analyzed. For 75% of the women, complementary prescription data were obtained from DIS and e-SUS.

The sociodemographic profile included women aged 12 to 42 years, with a mean age of 25.6 years (SD = 7.9). Most were White (68%), living with a partner (52.7%), had incomplete elementary education (26.1%), were students (21.8%), and resided in Porto Alegre (75%). Regarding substance use, 4.5% reported alcohol consumption during pregnancy, 12% tobacco use, and 3.5% illicit drug use (Table 1).

As for reproductive and obstetric characteristics, 42% were primigravida, 39.8% had one or two previous pregnancies, 13.8% had three or four, and 4.7% had five or more. Among multiparous women (n=182), 34.6% had no previous vaginal delivery, 39.6% had one, 19.8% had two or three, and 6% had four or more. With regard to previous cesarean delivery, 62.1% had none, 24.7% had one, 12.1% had two or three, and 0.5% had four or more. A history of miscarriage was reported by 21.5% of HRPW; among them, 73.1% had one miscarriage, and 26.9% had two or more.

For the current pregnancy, most women reported it was unplanned (69.2%). Gestational age at the first PNAR visit was predominantly 13–24 weeks (47%), followed by ≥25 weeks (31.7%) and ≤12 weeks (20.8%). There were 21 twin pregnancies (6.7%). Among the high-risk pregnancies, 2.9% resulted in fetal death, with three of these cases involving the death of one twin. The total number of parturients was 306 women, of whom 52.8% had a vaginal delivery.

Approximately 47% of the women included in the study had pre-pregnancy clinical conditions, with psychiatric disorders (17.9%) and systemic arterial hypertension (10.6%) being the most prevalent (Table 2). Regarding the number of pre-existing high-risk clinical conditions, 65% of the women had one condition, 24% had two, and 10% had three.

Most pregnant women (80%) developed clinical complications during pregnancy, with the most common being: gestational diabetes mellitus (GDM) (37.8%), follow-up by fetal medicine for investigation/monitoring of congenital malformations (14.4%), gestational hypertension/preeclampsia (13.5%), gestational toxoplasmosis (10.6%), and urinary tract infections, including pyelonephritis (9.3%) (Table 2). With regard to the number of clinical complications during pregnancy, 39% of the women had one complication, 36% had two, 16% three, 7% four, and 1% five or six complications.

Among the women analyzed, 22.8% required hospitalization during pregnancy for monitoring and treatment of preeclampsia (5.1%), glycemic control (4.8%), pyelonephritis (3.5%), and cervical insufficiency (2.9%), among other reasons. The length of hospital stay ranged from 1 to 7 days for about half of the sample (48.6%), while 30.6% required hospitalization for 15 days or more (Table 2).

During prenatal care, all women were prescribed at least one medicine, with an average of 9.25 medicines per woman (SD = 6.06). Excluding folic acid and ferrous sulfate, the percentage was 96.1%, with an average of 7.71 (SD = 6.00). The most frequent prescriptions were for medicines from the therapeutic groups acting on the alimentary tract and metabolism (31%), blood and blood-forming organs (25%), and the nervous system (14%). The most commonly prescribed drugs were ferrous sulfate (14%), NPH insulin (8.9%), and folic acid (6.1%) (Table 3).

It was possible to classify 93 medicines according to the FDA pregnancy risk classification (72% of the total) and 107 according to the Australian classification (83% of the total). The most common categories according to the FDA were C (36%) and B (24%), followed by D (8%), A (2%), and X (1.5%). According to the Australian classification, most medicines fell into categories B1/B2/B3 (29%) and A (23%), followed by C (19%), D (11%), and X (0.8%).

Regarding medicine use across pregnancy trimesters, 21% of prescriptions occurred in the first trimester, 31% in the second, and 48% in the third. There was a high rate of folic acid prescriptions (87.6%) in the first trimester, and in the third trimester, NPH insulin (69.9%), regular insulin (70.2%), and dipyrone (70%) were predominant.

The most frequently prescribed medicines, according to the most common clinical complications, were: NPH insulin (59.4% of pregnant women with GDM); methyldopa (57.1% of pregnant women with hypertension/preeclampsia); acetylsalicylic acid (ASA) (38.1% of pregnant women with hypertension/preeclampsia); spiramycin (81.8% of pregnant women with gestational toxoplasmosis); and nitrofurantoin (67.8% of pregnant women with urinary tract infection).

The mean number of prescriptions during hospitalization for delivery was 11.06 medicines per parturient (SD = 4.01). The mean length of hospital stay for delivery in the obstetric center was 1.4 days (SD = 0.61). Regarding the profile of medicines used during this period, the main therapeutic groups were: alimentary tract and metabolism (32%), nervous system (26%), and systemic hormonal preparations, excluding sex hormones and insulins (15%). The most frequently prescribed drugs were oxytocin (14.6%), dipyrone (9.6%), and metoclopramide (8.6%) (Table 4).

In the immediate postpartum period, the mean number of prescriptions was 8.98 medicines per woman (SD = 3.2). The mean length of stay in the immediate postpartum period was 3.1 days (SD = 1.5). The most prescribed therapeutic groups were: alimentary tract and metabolism (35%), nervous system (33%), and musculoskeletal system (12%). The most frequently prescribed medicines were metoclopramide (11.4%), paracetamol (10.7%), and simethicone (10%) (Table 5).

Discussion

Descriptive studies involving high-risk pregnant women are scarce; in this sense, the present study contributes by outlining the sociodemographic, clinical, and therapeutic profile of these women treated at a public hospital in southern Brazil, using data from electronic medical records, the DIS, and e-SUS systems.

The sociodemographic profile of high-risk pregnant women revealed a predominance of young women, aged up to 25 years, with low education levels and without insertion in the formal labor market. Such characteristics are often associated with social vulnerability, which may compromise adherence to prenatal care and worsen maternal and infant outcomes. Similar findings have been reported in studies indicating that social vulnerability and low education contribute to reduced adherence to prenatal care and may be associated with adverse pregnancy outcomes.[1,15,16]

With regard to race/skin color, 68.3% of pregnant women self-identified as White, followed by Black (17.6%) and Brown (12.2%). Although this distribution partially reflects the demographic composition of southern Brazil, it is important to highlight that Black and Brown women have historically faced greater barriers to access and quality of prenatal care, which can negatively impact pregnancy outcomes. Studies demonstrate that racial inequalities are associated with higher maternal and neonatal morbidity and mortality, even when controlling for other sociodemographic and clinical factors.[17]

Additionally, 3.5% of pregnant women reported using illicit drugs. A literature review found that the global prevalence of illicit drug use during pregnancy was 1.65% (self-reported through questionnaires) and 12.28% (when assessed using toxicological methods).[18] Furthermore, at least one in ten pregnant women reported tobacco use during pregnancy. The prevalence rates found in this study may be explained by the fact that HMIPV has dedicated beds for pregnant women who use drugs. Psychosocial support policies and prenatal follow-up programs are essential to reduce substance use and promote maternal and child health.

Regarding the clinical and reproductive profile, there was a high frequency of unplanned pregnancies, history of abortion, and multiparity—factors that, when combined, increase the risk of obstetric complications. These findings are consistent with studies that associate unplanned pregnancy with late initiation of prenatal care, thereby reducing opportunities for preventive and effective interventions.[19]

Among the various pre-existing clinical conditions, psychiatric disorders were the most prevalent, surpassing conditions such as systemic arterial hypertension (SAH) and diabetes mellitus. The availability of psychiatric beds at HMIPV may partly explain this difference. The diversity of psychiatric diagnoses was reflected in the variety of prescribed medicines, without the predominance of a single psychotropic drug among the most commonly used in the sample. Nevertheless, sertraline stood out among antidepressants, in line with the Ministry of Health guidelines for the treatment of moderate to severe depression during pregnancy.[2]

Mental health during pregnancy is an increasing concern. It is estimated that one in four pregnant women presents with some psychiatric disorder, with depression being the most common.[2] Clinical management requires caution, as it must balance the risks and benefits of medicines for both mother and fetus, aiming for clinical efficacy while minimizing fetal exposure to unsafe drugs.[13] In this study, although mental disorders were prevalent, psychiatric medicines were not among the most frequently prescribed during pregnancy, indicating an individualized approach and possibly restricted use for moderate or severe cases.

Preeclampsia emerged as the main cause of hospitalization, an expected result in a referral service for high-risk pregnancies. This condition, responsible for 22% of maternal deaths in Latin America and the Caribbean,[20] requires strict control.[21] Methyldopa was the main drug used, consistent with national and international protocols that recommend this antihypertensive as a first-line agent during pregnancy.[2,14] The use of ASA between the 12th and 36th weeks, indicated for the prevention of preeclampsia, was also identified in a significant number of prescriptions, evidencing adherence to best clinical practices.[22]

Gestational diabetes mellitus (GDM) was the main clinical complication observed, a finding similar to that of previous studies in high-risk services.[23-25] In addition to increasing the risk of adverse neonatal outcomes such as macrosomia, hypoglycemia, and prematurity, GDM represents a future risk factor for the development of type 2 diabetes in postpartum women.[23] NPH and regular insulin were the main drugs used, according to national guidelines for glycemic control during pregnancy.[2,26]

About one-quarter of women presented with infections during pregnancy, mainly toxoplasmosis, urinary tract infections (UTIs), syphilis, and COVID-19. These findings reinforce the importance of surveillance and early screening during prenatal care, especially in contexts of greater vulnerability.[27] Spiramycin was widely prescribed for toxoplasmosis, as well as nitrofurantoin and ampicillin for UTIs, in line with the literature.[2] However, it should be noted that nitrofurantoin should be avoided in the late stages of pregnancy due to the risk of neonatal jaundice and hemolytic anemia.[2]

The high prevalence of medicines prescription during prenatal care was expected and is consistent with the findings of a previous study conducted in Ribeirão Preto, SP.[25] When analyzing the most frequently prescribed drugs, there was a predominance of those commonly used in low-risk pregnancies: supplements (ferrous sulfate and folic acid), antiemetics (metoclopramide), and analgesics (dipyrone and paracetamol). In addition, there was high consumption of medicines used to treat high-risk clinical conditions: NPH insulin and regular insulin (GDM), methyldopa (gestational hypertension), and aspirin (preeclampsia prevention).

There was a predominance of prescriptions in the last trimester of pregnancy, which may be related to the higher incidence of clinical complications during this period, such as preeclampsia, GDM, and preterm labor.[2,14] Folic acid was the most prescribed drug in the first trimester, indicated for the prevention of neural tube defects,[7] followed by metoclopramide, commonly used to control nausea and vomiting—frequent symptoms at this stage,[2] while aspirin was the most prescribed drug in the second trimester, used for preeclampsia prevention, followed by ferrous sulfate, supplementation recommended due to iron deficiency during

pregnancy.[7] In the third trimester, there was greater prescription of medicines for GDM control, especially NPH and regular insulin.

Regarding fetal safety, most of the prescribed drugs belonged to category B of risk according to FDA and TGA, which indicates an acceptable profile for use during pregnancy. Nonetheless, some of the drugs used did not have a clear gestational classification in the consulted agencies, reinforcing the need for further studies on medicine safety during pregnancy.

During hospitalization for childbirth, the prescription of medicines was higher than that observed during prenatal care. Uterotonics, analgesics, and antiemetics were the most frequently used, especially oxytocin, which is used to induce vaginal delivery, representing a relevant strategy to reduce cesarean sections in high-risk pregnancies.[28] It was observed that 52.8% of births occurred via vaginal delivery, a percentage close to the national average (57%).[29] For a high-risk population, this finding suggests that well-conducted obstetric practices, such as pharmacological induction, may contribute to better maternal and perinatal outcomes.

In the immediate postpartum period, the number of prescriptions remained high, mainly aimed at managing symptoms such as nausea, constipation, pain, and anemia. The use of cabergoline was identified among postpartum women living with HIV, a recommended practice due to the contraindication of breastfeeding in these cases.[30] Prophylaxis with anti-D immunoglobulin was also observed, demonstrating adherence to protocols in cases of Rh incompatibility.[2]

This study had the limitation of missing data regarding the start and end date of treatment for 9% of prenatal prescriptions, making complete analysis impossible. For those who obtained medicines in primary care in Porto Alegre, it was possible to consult prescriptions through DIS and e-SUS and access the exact start date of treatment. For the others, the information was obtained through medical progress notes in hospital records. However, as progress notes are written in free text, in many cases there was only a record of the use of a given drug, without information regarding the start date of use. Another limitation refers to the considerable number of drugs that do not have gestational risk classification in the consulted regulatory agencies, which hindered the analysis of safety during pregnancy.

Conclusion

A profile of predominantly young high-risk pregnant women with low educational attainment was identified, a factor that may contribute to greater social vulnerability and barriers to accessing health information and services. Most pregnancies were unplanned, reinforcing the need for public policies focused on sexual education and reproductive planning.

The high prevalence of psychiatric disorders and chronic diseases, such as hypertension and diabetes mellitus, highlights the clinical complexity of this group, requiring specialized and continuous care. The complications identified during prenatal care—particularly gestational diabetes and fetal malformations—together with the substantial rate of hospitalizations, corroborate the impact of increased risk on maternal and perinatal health.

Most prescribed medicines followed safety profiles consistent with pregnancy recommendations. Drugs requiring greater caution were used in accordance with clinical protocols, balancing benefits and risks for both mother and fetus. Health education and pharmaceutical counseling play a key role in ensuring the rational and safe use of medicines during pregnancy, delivery, and the postpartum period.

Thus, the management of high-risk pregnant women requires an integrated multidisciplinary approach, with emphasis on clinical and pharmacological surveillance as well as educational strategies, aiming to improve maternal and neonatal outcomes.

Funding sources

This research received no funding for its development.

Contributors

Study conception: DLL, LRLP, TSDP; study design: DLL, TSDP; data collection: DLL, DAA; data analysis and interpretation: DLL, LRLP, TSDP; manuscript drafting: DLL, TSDP; critical manuscript review: DLL, LRLP, TSDP.

Acknowledgments

To my parents, partner, and family for their support throughout the master's program; to my pharmacist colleagues at HMIPV for their encouragement and support during the development of this research; to my advisors for their guidance; and to the institutions HMIPV and UFRGS for making this work possible.

Conflict of interest statement

The authors declare no conflicts of interest related to this article.

Artificial Intelligence

We would like to declare that ChatGPT was used as a tool for text revision.

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Table 1. Sociodemographic profile of high-risk pregnant women and substance use. Porto Alegre, RS, September 2021 to March 2022.

Sociodemographic Profile	n	%
Age group (years)		
< 15	12	3.8
15 – 25	149	47.8
26 – 40	143	45.8
> 40	8	2.6
Race/skin color		
White	213	68.3
Black	55	17.6
Brown	38	12.2
Yellow	6	1.9
Marital status*		
With partner	164	52.7
Without partner	147	47.3
Education level*		
Incomplete elementary school	81	26.1
Complete elementary school	37	11.9
Incomplete high school	73	23.5
Complete high school	79	25.5
Incomplete higher education	23	7.4
Complete higher education	17	5.5
Occupation		
Student	68	21.8
Service workers, salespeople in shops and markets	60	19.2
Homemaker	55	17.6
Unemployed	45	14.4
Administrative service workers	31	9.9
Other	28	9.0
Members of the armed forces, police, and military firefighters	15	4.8
Science and arts professionals	10	3.2
Place of residence		
Porto Alegre	234	75
Metropolitan Region	55	17.6
Countryside	23	7.4
Alcohol use during pregnancy		
Yes	14	4.5
Tobacco use during pregnancy		
Yes	37	11.9
Illicit drug use during pregnancy		
Yes	11	3.5

* Totals are lower than the total analyzed due to missing data). Total number of pregnant women analyzed: n=312

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Table 2. Clinical profile of high-risk pregnant women and health complications during prenatal care. Porto Alegre, RS, September 2021 to March 2022.

Clinical Profile	n	%
Medical history[a]		
Psychiatric disorders	56	17.9
Hypertension	33	10.6
Diabetes mellitus	24	7.7
Asthma	24	7.7
Others[1]	20	6.4
HIV	17	5.4
Obesity	15	4.8
Hypothyroidism	10	3.2
Previous high-risk pregnancy	10	3.2
Substance use disorder	4	1.3
Health complications during pregnancy[b,c]		
Gestational diabetes	118	37.8
Fetal malformation (investigation/monitoring)	45	14.4
Others[2]	44	14.1
Gestational hypertension/preeclampsia	42	13.5
Gestational toxoplasmosis	33	10.6
Urinary tract infection/pyelonephritis	29	9.3
Gestational syphilis	18	5.8
Cervical changes	17	5.5
Psychiatric disorders	16	5.2
COVID-19	15	4.8
Vulvovaginitis	15	4.8
Hospitalization		
Yes	71	22.8
Reasons for hospitalization (n=78)[d]		
Preeclampsia	16	5.1
Glycemic control	15	4.8
Pyelonephritis	11	3.5
Others[3]	11	3.5
Cervical insufficiency	9	2.9
Psychiatric hospitalization	7	2.2
Fetal malformation	5	1.6
Blood pressure control	4	1.3
Length of hospital stay (days)		
1 to 7	35	48.6
8 to 14	15	20.8
15 or more	22	30.6

[a]Only medical histories with more than 4 cases (1.3%) are presented in the table. [b]Only health complications during pregnancy equal to or greater than 15 cases (3.6%) are presented in the table. [c]Pregnant women had one or more clinical complications, totaling 392 complications. [d]Only reasons for hospitalization with more than 4 cases (1.3%) are presented. Other[1]: epilepsy (n=3), pituitary adenoma (n=2), bronchitis (n=2), intellectual disability (n=2), heart disease (n=1), celiac disease (n=1), chronic kidney disease (n=1), phenylketonuria (n=1), hepatitis C (n=1), hepatitis B (n=1), hidradenitis (n=1), neurosyphilis (n=1), deep vein thrombosis (n=1), varicose veins (n=1), social vulnerability (n=1). Other[2]: gestational hypothyroidism (n=7), HIV diagnosis during pregnancy (n=5), anemia/bleeding (n=4), condyloma acuminatum (n=4), premature rupture of membranes (n=4), skin lesions (n=3), cholestasis (n=2), subchorionic hematoma (n=2), hyperemesis gravidarum (n=2), genital herpes (n=2), spontaneous abortion (n=1), increased amniotic fluid index (n=1), cardiomegaly (n=1), placental abruption (n=1), cytomegalovirus infection (n=1), oligohydramnios (n=1), submucosal myoma (n=1), teratoma (n=1), thrombophlebitis (n=1). Other[3]: membrane rupture or distension (n=3), hyperemesis gravidarum (n=2), anticoagulation/suspected thrombosis (n=2), liver enzyme alterations (n=1), urinary tract infection (n=1), vaginal bleeding (n=1), preterm labor (n=1). Total number of pregnant women analyzed: n=312

Table 3. Most frequently prescribed medicines for high-risk pregnant women during prenatal care, by therapeutic group and gestational risk classification. Porto Alegre, RS, September 2021 to March 2022.

Therapeutic groups and subgroups (ATC[a] levels 1 and 5)	N	%	N pregnant women	%	FDA[b]	TGA[b]
A – Alimentary tract and metabolism	**901**	**31.0**	**243**	**77.9**		
Insulin isophane (NPH) subcutaneous	259	8.9	91	29.2	B	NC
Metoclopramide (oral/intravenous)	104	3.6	88	28.2	B	A
Human regular insulin (subcutaneous)	100	3.4	31	9.9	B	NC
B – Blood and hematopoietic organs	**716**	**24.6**	**299**	**95.8**		
Ferrous sulfate (oral)	408	14	288	92.3	NC	NC
Folic acid (oral)	177	6.1	175	56.1	A	A
Acetylsalicylic acid (oral)	76	2.6	68	21.8	NC	C
N – Nervous system	**420**	**14.4**	**167**	**53.5**		
Paracetamol (oral)	121	4.2	100	32.0	NC	A
Sertraline (oral)	54	1.9	33	10.6	C	C
Dipyrone (oral/intravenous)	81	2.8	55	17.6	NC	NC
J – Anti-infectives for systemic use	**365**	**12.5**	**159**	**51.0**		
Nitrofurantoin (oral)	66	2.3	54	17.3	B	A
Ampicillin (oral/intravenous)	47	1.6	34	10.9	B	A
Benzathine benzylpenicillin (intramuscular)	45	1.5	21	6.7	B	A
G – Genitourinary system and sex hormones	**176**	**6.0**	**139**	**44.5**		
Miconazole (intravaginal)	75	2.5	65	20.8	NC	A
Metronidazole (intravaginal)	57	2.0	52	16.7	B	B2
Progesterone (intravaginal/oral)	38	1.3	36	11.5	B	A
C – Cardiovascular system	**134**	**4.6**	**65**	**20.8**		
Methyldopa (oral)	116	4.0	53	17.0	B	A
Nifedipine (oral)	11	0.4	8	2.6	C	C
Amlodipine (oral)	5	0.2	4	1.3	C	C
H – Systemic hormonal preparations, excluding sex hormones and insulins	**63**	**2.2**	**49**	**15.7**		
Betamethasone (intramuscular)	30	1.0	29	9.3	C	C
Levothyroxine (oral)	27	0.9	18	5.8	A	A
P – Antiparasitic products, insecticides, and repellents	**51**	**1.8**	**39**	**12.5**		
Metronidazole (oral)	27	0.9	25	8.0	B	B2
Pyrimethamine (oral)	10	0.3	10	3.2	C	B3
Permethrin (topical)	9	0.3	6	1.9	B	B2
R – Respiratory system	**46**	**1.6**	**32**	**10.3**		
Loratadine (oral)	17	0.6	15	4.8	NC	B1
Salbutamol (inhaled)	14	0.5	32	10.2	C	A
Dimenhydrinate (oral)	4	0.1	4	1.3	B	A
D – Dermatologicals	**21**	**0.7**	**19**	**6.1**		
Dexamethasone (topical)	5	0.2	5	1.6	NC	NC
Miconazole (topical)	4	0.1	4	1.3	NC	A
Metronidazole (topical)	4	0.1	4	1.3	B	B2
V – Various	**9**	**0.3**	**9**	**2.9**		
Folinic acid (oral)	9	0.3	9	2.9	C	A
M – Musculoskeletal system	**8**	**0.3**	**5**	**1.6**		
Ibuprofen (oral)	6	0.2	4	1.3	C	C
Total	2912	100	312	100		

[a]Anatomical Therapeutic Chemical (ATC) Classification System. For each group (level 1), the most frequently used medicines are presented (level 5). [b]NC – Not classified, corresponds to medicines without gestational risk classification by the Food and Drug Administration (FDA) and Therapeutic Goods Administration (TGA). Italicized values correspond to the totals at ATC level 1. Total pregnant women analyzed: n = 312, total medicines: n = 2,912

Table 4. Most frequently prescribed medicines for high-risk pregnant women during hospitalization for delivery. Porto Alegre, RS, September 2021 to March 2022.

Therapeutic groups and subgroups (ATC[a] levels 1 and 5)	N	%	N pregnant women	%
A -Alimentary tract and metabolism	**1084**	**32.1**	**303**	**99.0**
Metoclopramide (oral/intravenous)	290	8.6	289	94.4
Hyoscine (oral/intravenous)	218	6.4	216	70.6
Ondansetron (oral/intravenous)	175	5.2	162	52.9
N – Nervous system	**888**	**26.3**	**302**	**98.7**
Dipyrone (oral/intravenous)	323	9.6	293	95.7
Tramadol (intravenous)	154	4.6	147	48.0
Paracetamol (oral)	140	4.1	137	44.8
H – Systemic hormonal preparations, excluding sex hormones and insulins	**505**	**14.9**	**295**	**96.4**
Oxytocin (intravenous/intramuscular)	493	14.6	294	96.1
Levothyroxine (oral)	8	0.2	7	2.3
Betamethasone (intramuscular)	4	0.1	4	1.3
J – Anti-infectives for systemic use	**281**	**8.3**	**183**	**59.8**
Cefazolin (intravenous)	133	3.9	132	43.1
Potassium benzylpenicillin (intravenous)	90	2.7	45	14.7
Zidovudine (intravenous)	24	0.7	16	5.3
M – Musculoskeletal system	**234**	**6.9**	**233**	**76.1**
Ketoprofen (intravenous))	128	3.8	128	41.8
Ibuprofen (oral)	106	3.1	106	34.6
B – Blood and blood-forming organs	**161**	**4.8**	**152**	**49.7**
Ferrous sulfate (oral)	134	4	131	42.8
Magnesium sulfate (intravenous)	11	0.3	11	3.6
Tranexamic acid (intravenous)	7	0.2	7	2.3
G – Genitourinary system and sex hormones	**134**	**4**	**119**	**8.9**
Misoprostol (intravaginal/oral)	114	3.4	110	35.9
Methylergometrine (intramuscular)	11	0.3	10	3.3
Cabergoline (oral)	8	0.2	8	2.6
C – Cardiovascular system	**85**	**2.5**	**57**	**18.6**
Methyldopa (oral)	46	1.4	45	14.7
Nifedipine (oral)	27	0.8	26	8.5
Captopril (oral)	4	0.1	4	1.3
Total[b]	3381	100	306	100

[a]Anatomical Therapeutic Chemical (ATC) Classification System. For each group (level 1), the most frequently used medicines are presented (level 5). *Italicized values correspond to the totals at ATC level 1.* Total women analyzed: n = 306, total medicines: n = 3,381

Table 5. Main medicines used by high-risk pregnant women during the immediate postpartum period. Porto Alegre, RS, September 2021 to March 2022.

Therapeutic groups and subgroups (ATC[a] levels 1 and 5)	N	%	N pregnant women	%
A – Alimentary tract and metabolism	**966**	**35.3**	**289**	**94,4**
Metoclopramide (oral/intravenous)	311	11.4	290	94.8
Simethicone (oral)	273	10	271	88.6
Mineral oil (oral)	146	5.3	145	47.4
N – Nervous system	**898**	**32.8**	**305**	**99.7**
Paracetamol (oral)	294	10.7	267	87.2
Dipyrone (oral/intravenous)	254	9.3	201	65.7
Tramadol (intravenous)	129	4.7	117	38.2
M – Musculoskeletal system	**324**	**11.8**	**278**	**90.8**
Ibuprofen (oral)	227	8.3	227	74.2
Ketoprofen (intravenous)	97	3.5	97	31.7
B – Blood and blood-forming organs	**260**	**9.5**	**250**	**81.7**
Ferrous sulfate (oral)	246	9	244	79.7
Heparin (subcutaneous)	8	0.3	8	2.6
Enoxaparin (subcutaneous)	3	0.1	3	1.0
H – Systemic hormonal preparations, excluding sex hormones and insulins	**115**	**4.2**	**70**	**22.9**
Oxytocin (intramuscular)	103	3.8	61	19.9
Levothyroxine (oral)	8	0.3	8	2.6
Hydrocortisone (intravenous)	4	0.1	4	1.3
C – Cardiovascular system	**82**	**3**	**49**	**16**
Methyldopa (oral)	39	1.4	39	12.7
Nifedipine (oral)	20	0.7	19	6.2
Enalapril (oral)	10	0.4	10	3.3
J – Anti-infectives for systemic use	**65**	**2.4**	**41**	**13.4**
Anti-D immunoglobulin (Rh) (intramuscular)	15	0.5	15	4.9
Tenofovir + Lamivudine (oral)	12	0.4	12	3.9
Atazanavir (oral)	7	0,3	7	2,3
G – Genitourinary system and sex hormones	**16**	**0,6**	**16**	**5,3**
Cabergoline (oral)	12	0.4	12	3.9
Misoprostol (intravaginal/oral)	4	0.1	4	1.3
R – Respiratory system	**11**	**0.4**	**9**	**2.9**
Promethazine (intravenous)	6	0.2	6	2.0
Total[b]	2740	100	305	100

[a]Anatomical Therapeutic Chemical (ATC) Classification System. For each group (level 1), the most frequently used medicines are presented (level 5). *Italicized values correspond to the totals at ATC level 1.* Total postpartum women analyzed: n = 305, total medicines: n = 2,740

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