

USE OF ANTIMICROBIALS BY PREGNANT WOMEN IN THE PUBLIC HEALTH CARE

Uso de antimicrobianos por gestantes no serviço público de saúde

Uso de antimicrobianos por embarazadas del servicio público de salud

Original Article

ABSTRACT

Objective: To identify and classify, according to the risk, the antimicrobials prescribed to pregnant women assisted by the National Program of Prenatal and Postpartum Follow-up in a municipality of Rio Grande do Sul. **Methods:** Analytical and retrospective cross-sectional study conducted in 2011 based on the registers of 87 pregnant women assisted in 2010 using an instrument with questions about the dispensed drugs. The prescribed antimicrobials were identified and classified as topical and systemic use and according to the risk of using it during pregnancy. Data were analyzed using SPSS 15.0. **Results:** The pregnant women had a mean age of 28.01 years and attended 5.3 consultations. There was an average prescription of 6.52 drugs/pregnant woman. Of the 568 drugs prescribed, 85 (14.96%) had an antimicrobial activity, 29 (34.1%) were for topical use and 56 (65.9%) for systemic use, and 46 (52.9%) pregnant women received at least one antimicrobial. There were 13 different products with a prevalence of antifungals of gynecological / topical use, 16 (18.82%), 30 (35.3%) were prescribed in the first trimester of pregnancy, 30 (35.3%) in the second and 25 (29.4%) in the third trimester. According to the classification of the risk to the fetus, nine (61.54%) antimicrobials belonged to the B category and four (30.77%) to the C category. **Conclusion:** It was verified the prescription of antimicrobials for systemic use and B category risk for pregnancy to 52.9% of pregnant women in prenatal follow-up in the place where the study took place. Miconazole and metronidazole vaginal cream, cephalexin 500 mg, azithromycin 500 mg and amoxicillin 500 mg were the most prescribed drugs.

Descriptors: Anti-bacterial Agents; Drug Utilization; Pregnancy.

RESUMO

Objetivo: Identificar e classificar quanto ao risco os antimicrobianos prescritos para gestantes atendidas no Programa Nacional de Acompanhamento Pré-Natal e Puerpério em um município do Rio Grande do Sul. **Métodos:** Estudo transversal analítico e retrospectivo, realizado em 2011, a partir do cadastro de 87 gestantes atendidas em 2010, por meio de um instrumento com questões relacionadas aos medicamentos dispensados. Os antimicrobianos prescritos foram identificados e classificados como de uso tópico e sistêmico, e quanto à categoria de risco de uso na gravidez, com tratamento realizado pelo SPSS 15.0. **Resultados:** As gestantes tinham idade média de 28,01 anos, realizaram 5,3 consultas. Foram prescritos em média 6,52 medicamentos/gestante, dos 568 medicamentos prescritos, 85 (14,96%) com ação antimicrobiana, 29 (34,1%) de uso tópico e 56 (65,9%) uso sistêmico, sendo que 46 (52,9%) gestantes receberam pelo menos um antimicrobiano. Encontrou-se 13 produtos distintos, prevalecendo antifúngicos de uso ginecológico/tópico, 16 (18,82%), 30 (35,3%) foram prescritos no primeiro trimestre de gravidez, 30 (35,3%) no segundo e 25 (29,4%) no terceiro. Conforme a classificação de risco ao feto, nove (61,54%) antimicrobianos são da categoria B e quatro (30,77%) da categoria C. **Conclusão:** Verificou-se a prescrição de antimicrobianos de uso sistêmico e de risco B na gestação para 52,9% das gestantes em acompanhamento pré-natal no local do estudo. Miconazol e metronidazol creme vaginal, cefalexina 500 mg, azitromicina 500 mg e amoxicilina 500 mg foram os mais prescritos.

Descritores: Antibacterianos; Uso de medicamentos; Gravidez.

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RESUMEN

Objetivo: Identificar y clasificar el riesgo de los antimicrobianos prescritos a las embarazadas asistidas en el Programa Nacional de Atención Prenatal y Puerperio en el municipio de Rio Grande do Sul. **Métodos:** Estudio transversal analítico y retrospectivo realizado en 2011 con el registro de 87 embarazadas asistidas en 2010 a través de un instrumento con preguntas relacionadas a los medicamentos dispensados. Los antimicrobianos prescritos fueron identificados y clasificados de uso tópico y sistémico y respecto la categoría de riesgo del uso en el embarazo, con análisis realizado por el SPSS 15.0. **Resultados:** Las embarazadas tenían edad media de 28,01 años y realizaron 5,3 consultas. Fueron prescritos una media de 6,52 medicamentos/embarazada, de los 568 medicamentos prescritos, 85 (14,96%) con acción antimicrobiana, 29 (34,1%) de uso tópico y 56 (65,9%) de uso sistémico, siendo que 46 (52,9%) de las embarazadas recibieron por lo menos un antimicrobiano. Se encontró 13 productos distintos con prevalencia de anti fúngicos de uso ginecológico/tópico, 16 (18,82%), 30 (35,3%) fueron prescritos en el primer trimestre del embarazo, 30 (35,3%) en el segundo y 25 (29,4%) en el tercero. Según la clasificación de riesgo al feto, nueve (61,54%) antimicrobianos son de la categoría B y cuatro (30,77%) de la categoría C. **Conclusión:** Se verificó la prescripción de antimicrobianos de uso sistémico y de riesgo B en el embarazo para el 52,9% de las embarazadas en atención prenatal en el sitio del estudio. Miconazol y metronidazol crema vaginal, cefalexina 500 mg, azitromicina 500 mg y amoxicilina 500 mg fueron los más prescritos.

Descriptores: Antibacterianos; Utilización de Medicamentos; Embarazo.

INTRODUCTION

The use of medicines by pregnant women and its consequences for children who will be born has become a big concern after events occurring between the late 50's and early 60's⁽¹⁾.

Gestation, for its biological peculiarities, turns the woman and her fetus particularly exposed to risks, among which stand out the relationship to the use of medications⁽²⁾. The fetal response to the use of medicines is different from that observed in the mother and may result in fetal toxicity, with various injuries, some of which may be irreversible⁽³⁾.

The use of drugs during pregnancy should be avoided, however, in some situations, such use is essential⁽⁴⁾, becoming possibly harmful to women with chronic diseases or suffering medical complications during gestation⁽⁵⁾. The information about the risks of the use of medicines during pregnancy are quite limited, regarding both quantity and quality aspects, which is mainly due to ethical and methodological difficulties of this research area⁽⁴⁾.

Information about the risk of using drugs during pregnancy are scarce, its indiscriminate use due to self-medication or medical prescriptions without technical-scientific criteria is reported in different countries⁽¹⁾. A study on high-risk pregnant women showed statistically significant associations between self-medication in women with fewer prenatal consultations, smoking during gestation and bigger number of children⁽⁶⁾.

Considering that, during gestation, urinary tract infections (UTI) are quite common, with up to 10% of pregnant women experiencing an episode of urinary tract infection, being mostly asymptomatic⁽⁴⁾, the prescription of antimicrobial drugs in this period is justified. In a study⁽⁷⁾ that analyzed prescriptions for pregnant women admitted to a hospital in the municipality of Mirassol/SP, antimicrobials were present in 40% of the prescriptions, and the most prescribed were cephalothin (10.8%) and cephalexin (4.6%). In another study⁽⁸⁾ concerning pregnant women who attended consultations in the prenatal service of the *Sistema Único de Saúde – SUS* (Unified Health System) in six Brazilian cities, antimicrobials were used by 11.1% of pregnant women, accounting for 6.9% of the used medications.

In addition to the increased incidence of UTI and other infections in pregnant women, during this period the antimicrobial prophylactic and therapeutic options are limited, considering the toxicity of the drugs to the fetus⁽⁹⁾.

In this context, it is highlighted that the greatest amount of the medicines with antimicrobial action, according to the fetal risk rating system, belongs to the category B⁽⁴⁾, indicating that studies have been conducted in animal reproduction using these drugs showing no fetal risks, however, lacking controlled studies in pregnant women or animal reproduction studies demonstrating adverse effects that were not confirmed in controlled studies in women in the first trimester, but without evidence of risk in the other trimesters⁽¹⁰⁾.

Given the above, the objective of this study was to identify and classify, according to the risk, the antimicrobials prescribed to pregnant women assisted by the National Program for Prenatal and Postpartum Follow-up in a municipality of Rio Grande do Sul.

METHODS

A cross-sectional and retrospective study was performed on the analysis of prescriptions for pregnant women assisted by the National Program of Prenatal and Postpartum Follow-up in a *Unidade Básica de Saúde Central - UBS – Central* (Central Basic Health Care Unit) and in the

Centro de Atendimento aos Adolescentes – CAAMI (Center for Adolescents' Assistance) of the Municipality of Ijuí/RS in 2010.

Data collection occurred with access to all medical records of pregnant women attended in the areas included in the research in early 2011, with the aid of a data collection instrument that contained questions related to the socioeconomic characteristics of these as well as the dispensed drugs for pregnant women at these places. Data collection was executed by trained researchers and information was obtained from two places: UBS-Central and CAAMI from the Municipality of Ijuí/RS, through access to the medical records of pregnant women and the computerized system for drug dispensation existing at these sites. Data collection was optimized by the creation of an instrument that was filled by a researcher and subsequently validated by another. On average, 20 records were analyzed per day.

All pregnant women attended in the above places receiving at least the prescription of one medication were included in this study. Non-pregnant women, pregnant women who did not receive any prescription drug and pregnant women assisted by other health units from the municipality were excluded.

The prescribed antimicrobial drugs were identified by its generic name and pharmaceutical form, allowing its classification as either a topical or a systemic use.

Antimicrobials were also grouped according to the risk category of use in gestation according to the Food and Drug Administration (FDA), described as follows: Category A: studies in women showed no risk to the fetus in the first trimester and the possibility of injury to the fetus seems remote; category B: Animal reproduction studies have not demonstrated fetal risk but there are no studies in pregnant women, or studies in animal reproduction demonstrating adverse effects were not confirmed in studies in women in the first trimester; category C: studies in animals have shown adverse effects on the fetus and there are no studies in women or studies in women and animals are not available. The drugs should be used only if the potential benefit justifies the potential fetal risk; category D: there is positive evidence of human fetal risk, but the benefits from its use in gestation may be acceptable despite the risk; category X: studies in animals or humans have demonstrated fetal abnormalities or there is evidence of fetal risk based on human experience or both, and the risk of the drug use in pregnant women clearly exceeds any possible benefit⁽¹¹⁾.

Data interpretation was performed according to the total number of medications used by pregnant women, identification and quantification of antimicrobials, as well

as the gestational period in which they were prescribed, analyzing the risk/benefit of such use during the period. This analysis was conducted through a descriptive approach, with mean and standard deviation, being held a correlation between the number of medications and the number of medical consultations by Spearman's correlation, being the statistical treatment elaborated by the Statistical Package for the Social Sciences software (SPSS) (version 18.0).

The research was approved by the Unijuí Research Ethics Committee under protocol 153/2011. The access to the database was obtained after authorization at the local of the survey, and researchers and those responsible for the surveyed areas have signed a non-disclosure agreement, ensuring the confidentiality of data.

RESULTS

The sample comprised of 87 pregnant women who had prenatal care, all assisted by the SUS. The mean age of pregnant women was 28.01 ± 6.61 years old. Regarding age group, 41 (47.13%) were aged 20-29 years (Table I).

Table I - Distribution of assisted pregnant women during the study period according to age group attended at the UBS Central and CAAMI in the municipality of Ijuí-RS in 2010. Ijuí/RS, 2011.

Age Group	n (%)
16 – 19	12 (13.79)
20 – 29	41(47.13)
30 – 39	29 (33.33)
≥ 40 years	5 (5.75)
Total	87 (100)

The mean of consultations by pregnant women was 5.3 ± 3.01 . Table II displays the total amount and the mean number of medicines prescribed to pregnant women in relation to the number of prenatal visits, however, the Spearman's correlation coefficient revealed a significant weak positive correlation ($r=0.281$; $p=0.008$) between the number of consults and the number of medications, although no association being found between those variables.

It was found the prescription of 568 medications, a mean of 6.52 medications/pregnant women. Out of these, 85 (14.96%) have antimicrobial action, being 194 (34.1%) topical, and 374 (65.9%) for systemic use.

From the 85 prescribed antimicrobials, there were 13 specific products. The most frequently prescribed antimicrobials were miconazole vaginal cream, cephalixin 500 mg, metronidazole vaginal cream, azithromycin 500 mg and amoxicillin 500 mg.

From all women who used medications during pregnancy during the study period 46 (52.9%) received antimicrobial prescriptions.

It is noteworthy that among the 46 women who received prescription containing antimicrobials during gestation, it was prescribed one antimicrobial to 24 (54.4%) women, two to 10 (21.7%), three to 6 (13.1%), four to 3 (6.5%) and more than five to 2 women (4.4%). Note that these numbers do not refer to the concomitant use but throughout the gestation period.

Table III presents the trimester in which the studied pregnant women received antimicrobials, being observed that the gynecological products were the most prescribed ones.

Concerning the antimicrobials prescribed for pregnant women, it was found that eight (61.54%) antimicrobials belonged to category B and four (30.77%) from category C, according to the risk category established by the FDA.

Table II - Number and mean of medications used by pregnant women in relation to the number of prenatal consultations assisted at the UBS Central and CAAMI in the municipality of Ijuí-RS, in 2010. Ijuí/RS, 2011.

Consultations	Pregnant Women n(%)	Medications n(%)	Medications/pregnant women mean
≥ 3	19 (21.84)	106 (18.66)	5.58
4 – 6	25 (28.74)	144 (25.35)	5.76
7 – 9	29 (33.33)	206 (36.27)	7.10
≥ 10	14 (16.09)	112 (19.72)	8
Total	87 (100)	658 (100)	

Spearman's Correlation: $r=0.281$; $p=0.008$.

Table III - Distribution of pregnant women according to the prescribed antimicrobial drug and gestational period attended at the UBS Central and CAAMI in the municipality of Ijuí-RS, in 2010. Ijuí/RS, 2011.

Antimicrobial	1 st trimester (n%)	2 nd trimester (n%)	3 rd trimester (n%)	Total products
Miconazole VC* 2%	16 (20)	7 (23.33)	3 (12)	16 (18.82)
Cephalexin 500 mg	2 (6.67)	7 (23.33)	4 (16)	13 (15.29)
Metronidazole VC	5 (16.67)	4 (13.33)	3 (12)	12 (14.12)
Azithromycin 500 mg	2 (6.67)	4 (13.33)	5 (20)	11 (12.94)
Amoxicillin 500 mg	6 (20)	3 (10.01)	2 (8)	11 (12.94)
Metronidazole 250 mg	2 (6.67)	2 (6.67)	3 (12)	7 (8.24)
Fluconazole 150 mg	4 (13.33)	2 (6.67)	-	6 (7.06)
Sulf. 400mg/trim. 80 mg**	-	1 (3.33)	3 (12)	4 (4.71)
Others	3 (10)	-	2 (8)	5 (5.88)
Total	30 (100)	30 (100)	25 (100)	85 (100)

*VC= vaginal cream; **sulfamethoxazole-trimethoprim; ***Spearman's correlation $r=0.281$; $p=0.008$.

DISCUSSION

Pregnant women are often exposed to medicines⁽¹²⁾. A research conducted in São Paulo comprising 1,581 women showed that 97.6% of them used at least one medication during gestation and 2.2% used more than ten, with a mean of 4.2 drugs per woman⁽³⁾. From 100 women who received

prenatal care at SUS services in Santa Rosa/RS, 90% used at least one medication during pregnancy, totaling 371 items, being the mean 4.1 drugs/pregnant women⁽¹²⁾. One study evaluated the prescription drugs to pregnant women in five UBS's of the municipality of Ijuí/RS, finding a mean of 3.5 drugs prescribed by pregnant woman⁽¹³⁾, corresponding to half of the mean of drugs prescribed in this present study

(6.5 drugs/pregnant women), indicating that the pregnant women from our research sites had more complications during gestation.

In a study performed in Ijuí/RS⁽¹³⁾, it was noticed that most of the pregnant women (47.9%) had from 7 up to 9 prenatal consultations, being the same number of appointments practiced by 33.33% of the women from this current study. The number of prescription drugs was related to the number of consultations⁽¹³⁾ and, such as another research⁽¹¹⁾ held in Santa Rosa/RS, it was found that the number of prescription drugs increases with the number of consultations. In this sense, it is suggested⁽¹²⁾ that the prenatal care of pregnant women facilitates the access to medications.

Accordingly, despite the avoiding of the unnecessary use of drugs in this population⁽⁴⁾, this result reflects the use of medications during gestation as a frequent practice in the UBS studied. It is recommended⁽¹³⁾ that before handling any medication during pregnancy, the pregnant woman and the prescriber should discuss its nature, the possible effects on the fetus and if its use is absolutely necessary. Ideally, the administration of any kind of medication during gestation should be averted, which rarely occurs⁽¹⁴⁾.

Regarding the number of prenatal consultations, the mean number was 6.2⁽¹⁵⁾ in Caxias do Sul/RS, which is close to the value found in this study, where approximately 5.3 appointments by pregnant woman were achieved. In a study⁽¹³⁾ conducted in Ijuí/RS, among the five studied UBSs, the central unit is pointed out, which was also included in this present study. That research⁽¹³⁾, showed that in 2008, the mean of appointments was 5.8, with a mean of 3.3 medications dispensed by pregnant women, numbers that remained stable during 2010, as verified by the current study.

Women are being encouraged to perform prenatal care and are responding to that call⁽¹⁰⁾. The prenatal care schedule must be programmed depending on the gestational periods that determine higher maternal and perinatal risk, achieving at least six appointments, preferably one in the first trimester, two in the second and three in the last trimester. The higher frequency of visits in late pregnancy aims the evaluation of perinatal risk and clinical and obstetric complications more common in this trimester, such as preterm labor, preeclampsia and eclampsia, premature rupture of membranes and fetal death⁽¹⁶⁾.

Accordingly, the healthcare actions implemented by the prenatal care program should be directed to comprise the entire target population of the area covered by the healthcare unit, ensuring the continuity of care, monitoring and evaluation of these actions on maternal and perinatal health. The Ministry of Health is responsible for establishing

policies and technical standards for the prenatal care of good quality. In addition to the necessary equipment and instruments, one should take into account the capacity of the health team⁽¹⁷⁾.

On the other hand, it is pointed out that prenatal appointments have facilitated the access of pregnant women to medications. A study on the social and psychological function of prescription drugs shows that for the doctor, the prescription is not only the documentation for his intervention in order to change the course of a disease or eliminate a symptom, but it is a sign of care to the patient⁽¹⁸⁾. Not receiving a medical prescription may be interpreted as disinterest and even medical incompetence, representing the breakdown of the doctor's relationship with its customers⁽¹⁸⁾.

Antibiotics for systemic use were prescribed approximately four times more than in a survey⁽¹⁸⁾ held in a teaching hospital in São Paulo, which found that systemic antibiotics were used by only 15.8% of patients.

In a study⁽⁸⁾ held in SUS prenatal services in six Brazilian cities, it was observed that 11.1% of pregnant women were prescribed antimicrobials, corresponding to 6.9% of the medicines used by them. The most commonly prescribed groups were penicillins (40%), tetracyclines (30%) and sulfonamides associated with trimethoprim (11%). Another investigation⁽¹³⁾ found that 13.90% of prescription drugs for pregnant women were anti-infectives for systemic use, being the third most prescribed anatomical group, with similar results found in Santa Rosa⁽¹²⁾, where the anti-infectives represented 14.2% of prescription drugs.

A study performed to assess the quality of antimicrobial use by pregnant women in a hospital in Cuba between 2007- 2009 pointed out that vaginal sepsis was the disease that most led to its use, mostly having a clinical diagnosis and the most prescribed antimicrobials were azithromycin, metronidazole, clotrimazole and nystatin⁽¹⁹⁾.

The systemic antibiotics most often prescribed to pregnant women in this research were penicillins and cephalosporins, which, according to a study⁽²⁰⁾, act interfering with the synthesis of peptidoglycan in the bacterial cell wall after binding to β -lactam binding proteins. These antibiotics are safe and commonly prescribed to pregnant women, including cephalexin, ampicillin/amoxicillin and nitrofurantoin⁽²⁰⁾. Antibiotics that act by inhibiting cell wall synthesis offer lower side effect risks, allowing its use with great safety in pediatrics, gestation and lactation⁽²¹⁾. The above antimicrobials are among the drugs of choice in prenatal care, childbirth and postpartum period⁽¹⁶⁾.

Regarding the most prescribed antimicrobials to pregnant women studied in the present research, 30 (35.3%) were prescribed in the first trimester of pregnancy, 30

(35.3%) in the second and 25 (29.4%) in the third trimester. The inherent risks of the use of drugs during pregnancy can occur at any stage, however, the drugs have more intense effects when administered during the first trimester⁽¹⁴⁾, mainly between the 3rd and the 11th week⁽¹¹⁾. It is believed that during the period of fertilization and implantation (up to 17 days), toxic drugs can interrupt the gestation or not cause any effect. In the organogenesis period (18-56 days), the susceptibility to malformation is maximum and during the fetal period (from the 56th day on), the risk of morphological malformations is low. However, harmful substances administered during this period may cause functional organic changes, and also, behavioral, social and intellectual alterations.⁽⁴⁾

In order to guide the prescriber for the most appropriate therapeutic choice for a pregnant woman, the FDA classified the medications as its effects on pregnancy in risk categories⁽¹¹⁾. According to this classification, it was found in this study the prescription of category B antimicrobials to eight patients (61.54%), four (30.77%) of category C and none from categories D and X. It should be highlighted that no antimicrobials were classified into category A. These results reveal that the most prescribed antimicrobials for pregnant women are from category B, which is consistent with other studies^(5,13).

The medications from the risk category C were the second most prescribed medications in another study⁽¹³⁾, which was also demonstrated in this investigation. Nevertheless, the predominant risk category in both investigations was B.

Considering the great use of risk category C antimicrobials, it is drawn attention to the need to review the issued prescriptions to this group, since this category hold drugs in which studies were done on animals, revealing adverse effects on the fetus⁽¹⁰⁾. It is important to consider that the data obtained from animal studies can not be fully extrapolated to human pregnancy⁽¹⁴⁾. In this category are found antimicrobials for systemic use, like fluconazole, which was prescribed to five (5,75%) pregnant women from the current research. This medication presents an antifungal action and uncommon adverse reactions, including gastrointestinal disorders, headache, or, more rarely, hepatotoxicity and thrombocytopenia⁽²²⁾, and even abortion, augmentation of labor and fetal abnormalities in animals studies of fluconazole use⁽²²⁾.

Miconazole for gynecological use, the most prescribed drug in this study, is an azole derivative of broad spectrum of action⁽²²⁾, acting by the inhibition of ergosterol synthesis, an essential component of the fungal cell membrane⁽⁴⁾. It is a tissue amoebicide and has been the first choice for *Entamoeba histolytica* active infection cases, with an

estimated efficacy of 90%⁽²¹⁾. Its systemic use was virtually abandoned due to its toxicity⁽⁴⁾. Miconazole, in its various pharmaceutical forms, is the only antifungal incorporated to the list of drugs used in the prenatal, delivery and postpartum period, probably due to its reduced systemic effects (vaginal 1.4% and dermal less than 0.013%)⁽¹⁵⁾, which turns it less toxic.

The selection of an antibiotic for topical use is based primarily on its spectrum of action, on the etiology of the infection and on the possibility to lead to primary irritant reactions or sensitization. However, it is remarkable that topical antibiotics hold certain drawbacks that limit their indications, including the time elapsed until the pharmacological effect is set and the factors influencing its absorption, as the concentration and the nature of the active ingredient, the skin state and the vehicle behavior⁽²²⁾.

From the total of pregnant women investigated in this study, 6.89% received antimicrobial prescriptions belonging to risk category C during the first trimester of pregnancy. This drug class must be avoided in the first trimester because of the risks of congenital abnormalities⁽¹⁰⁾. Thus, it is suggested that pregnant women who will inevitably make use of drugs belonging to this category of risk during pregnancy are accompanied during the period of its use and the achieved results are recorded so they can be socialized and compared in order to benefit other women who might be in the same situation⁽²³⁾.

By reviewing category B antimicrobials used in this research, emphasis is laid on the following: cephalixin, azithromycin, and amoxicillin. The indication of these medications is justified because they are antimicrobial agents that may be indicated for gestational use due to their high selective toxicity and low potential for toxicity to the pregnant woman and fetus⁽⁷⁾. Cephalixin was the most prescribed systemic antibiotic (14.12%) for pregnant women studied in the current research. Another study⁽¹²⁾ refers to cephalixin as the fourth most prescribed drug (19.3%) in a study conducted in the same municipality, also comprising of pregnant women attended by the public health service.

Nitrofurantoin belongs to that same category of risk and may lead to neonatal hemolysis from the third trimester on⁽¹⁰⁾. In the current study, this drug has been prescribed to a woman in the second trimester of pregnancy.

It was not found any dispensing records in the electronic investigation regarding the use of antimicrobials belonging to risk categories D and X, which can be justified by the small number of drugs belonging to these classes. The lacking of medications from these categories is possibly related to the fact that standardized medications by the

Ministry of Health for this group (pregnant women) do not belong to these categories⁽¹⁶⁾.

During the gestational period, the UTI is the most common infection, with up to 10% of pregnant women being affected by an episode of urinary tract infection, mostly asymptomatic⁽⁴⁾. The microorganisms involved in about 80 to 90% of these infections come from the normal perineal flora. The gram-negative, such as *Klebsiella*, mainly *Escherichia coli*, *Enterobacter* and *Proteus* account for most other cases, in addition to enterococci and group B streptococcus. Asymptomatic bacteriuria is the most frequent. Additionally, symptomatic infections affecting the lower urinary tract (cystitis) or the upper tract (pyelonephritis)⁽¹⁶⁾ are also common complications in this group⁽⁴⁾.

A research⁽¹³⁾ also found no medications from risk category X prescribed to pregnant women in other UBS's from Ijuí/RS. There is an investigation⁽¹⁷⁾ that evaluated medications prescribed to pregnant women and their self-medication practice, that found the use of a proven teratogenic drug from this category (misoprostol), which had been used in an attempt to cause abortion. However, another research⁽⁸⁾ that verified the fetal risks through prescriptions of pregnant women in São Paulo noticed a high rate of category X drugs (3.5%).

Considering the risk categories where drugs are inserted and gestational trimesters, prescriptions containing risk category B drugs were assigned during all gestational periods in this current research. In this category are included medicines that showed no fetal risk in animal reproduction studies; or animal reproduction studies demonstrated adverse effects that were not confirmed in controlled studies in women in the first trimester (and there is no evidence of risk in other trimesters), requiring some caution regarding the prescription of these drugs⁽¹¹⁾. In this current study, only one medication for gynecological use from risk category C antimicrobials was prescribed in all three trimesters, being the others prescribed only in the first and second trimesters, which is not in accordance with the literature⁽¹⁰⁾, because some of the medicines from that category of risk should be avoided in the first trimester of gestation due to the risk of causing congenital abnormalities.

In this investigation, like others carried out in Brazil^(3,5,13,15), the majority of pregnant women were aged 20-29 years. However, according to a study from 2008 in Caxias do Sul/RS, pregnancy rates in adolescence are still high, totaling 26.2% for those aged under 20 years⁽¹⁵⁾. Another study⁽¹³⁾ also held in a UBS in Ijuí/RS found only six (3.5%) pregnant women aged 14-19 years, moreover, in our study, we found 12 (13.79%) in this age group.

There is no doubt that pregnant women are frequently exposed to medications as a result of typical complications of this period. Infections represent a relative source of maternal complications, reflecting on the prescription and the use of antimicrobials. The access to prenatal care and antibiotics for those pregnant women does not necessarily imply better health conditions or quality of life, because bad prescription habits, often unnecessarily, or even lacking information about some antibiotics can lead to unsafe treatments for both pregnant women and fetus⁽²⁴⁾.

The presented results show the need for actions that aim the promotion of knowledge related to the use of medications during the gestational period, as it is extremely important that the health-care professional team is aware of medications that can be used for that group, not exposing them to injuries or risks. The planning of educational interventions for pregnant women in order to discourage self-medication and update activities for health professionals seem essential for a gestation with quality, minimizing fetal risks. It is important to highlight that there was no contact with the pregnant women, limiting the access to some information, such as the use of prescription drugs that were dispensed in other places rather than in the municipal health pharmacy network, the use of non-prescription drugs, as well as the use of medicinal plants, representing a limitation of this study. Accordingly, it is emphasized that each one of these practices further exposes the pregnant woman and the fetus to risks related to the individual effect of the used medications and their interactions.

CONCLUSION

Antimicrobial medications were identified among 52.9% of the prescribed drugs to pregnant women assisted in the National Program of Prenatal and Postpartum Follow-up in a municipality of Rio Grande do Sul in 2010. The prescribed products are mostly of systemic use, miconazole vaginal cream, cephalexin 500 mg, metronidazole vaginal cream, azithromycin 500 mg, and amoxicillin 500 mg were the mostly prescribed. The majority of the products belong to the risk category B during pregnancy, which according to the FDA there is no direct evidence of risk to the fetus, but animal studies showed some fetal risk.

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REFERENCES

1. Carmo TA. Medicamentos e gravidez. *Saúde Rev.* 2003;5(10):55- 61.

2. Brum LFS, Pereira P, Felicetti LL, Silveira RD. Utilização de medicamentos por gestantes usuárias do Sistema Único de Saúde no município de Santa Rosa (RS, Brasil). *Ciênc Saúde Coletiva*. 2011;16(5):2435-42.
3. Henderson E, Mackillop L. Prescribing in pregnancy and during breast feeding: using principles in clinical practice. *Postgrad Med J*. 2011;87(1027):349-54.
4. Wannmacher L. Fármacos em gestação e lactação. In: Fuchs FD, Wannmacher L. *Farmacologia clínica*. 3ª ed. Rio de Janeiro: Guanabara Koogan; 2010. p. 1146-59.
5. Oliveira Filho AD, Gama DP, Leopardi MG, Dias JMG, Lyra JDP, Neves SJ. Aderência autorreferida a medicamentos prescritos durante a gestação. *Rev Bras Ginecol Obstet*. 2012;34(4):147-52.
6. Araújo DD, Leal MM, Santos EJV, Leal LB. Consumption of medicines in high-risk pregnancy: evaluation of determinants related to the use of prescription drugs and self-medication. *Braz J Pharm Sci*. 2013;49(3):491-9.
7. Furini AAC, Gomes AM, Silva CO, Vieira JKG, Silva VP, Atique, TSC. Estudo de indicadores de prescrição, interações medicamentosas e classificação de risco ao feto em prescrições de gestantes da cidade de Mirassol – São Paulo. *Rev Ciênc Farm Básica Apl*. 2009;30(2):211-16.
8. Mengue SS, Schenkel EP, Shmidt MI, Duncan BB. Fatores associados ao uso de medicamentos durante a gestação em seis cidades brasileiras. *Cad Saúde Pública*. 2004;20(6):1602-8.
9. Duarte G, Marcolin AC, Gonçalves CV, Quintana SM, Berezowski AT, Nogueira AA, et al. Infecção urinária na gravidez: análise dos métodos para diagnóstico e do tratamento. *Rev Bras Ginecol Obstet*. 2002;24(7):471-7.
10. Silva EV, Hoefler R, Heineck I, Lopes LC, Falkenberg MB, Lisboa SSML, et al. Fármacos e Gravidez. In: Ministério da Saúde (BR), Secretaria de Ciência, Tecnologia e Insumos Estratégicos, Departamento de Assistência Farmacêutica e Insumos Estratégicos. *Formulário terapêutico nacional: Rename 2010*. Brasília: Ministério da Saúde; 2010. p. 1071-85.
11. Meadows M. Pregnancy and the drug dilemma. FDA Consumer [internet] 2001 [acesso em 2013 Jan 16]. Disponível em: <http://www.fda.gov/fdac/feature/2001/301-preg.html>
12. Brum LFS, Pereira P, Felicetti LL, Silveira RD. Utilização de medicamentos por gestantes usuárias do Sistema Único de Saúde no município de Santa Rosa/RS. *Ciênc Saúde Coletiva*. 2011;16(5):2435-42.
13. Buzetto T, Bueno CS, Oliveira KR. Prescrição de medicamentos para gestantes atendidas pelo Programa de Acompanhamento Pré-natal do município de Ijuí-RS, Brasil. *Latin Am J Pharm*. 2011;30(1):81-8.
14. Monteiro MP. Informações para o uso de medicamentos na gravidez e lactação. Fortaleza: Universidade Federal do Ceará; 2008.
15. Trevisan MR, Lorenzi DR, Araújo NM, Ésber K. Perfil da assistência pré-natal entre usuárias do Sistema Único de Saúde em Caxias do Sul. *Rev Bras Ginecol Obstet*. 2002;24(5):293-9.
16. Ministério da Saúde (BR), Secretaria de Atenção à Saúde, Departamento de Ações Programáticas Estratégicas. *Pré-natal e puerpério: atenção qualificada e humanizada: manual técnico*. Brasília: Ministério da Saúde; 2005.
17. Ministério da Saúde (BR), Secretaria de Políticas de Saúde. *Assistência pré-natal: manual técnico*. Brasília: Ministério da Saúde; 2000.
18. Fonseca MRCC, Fonseca E, Bergsten-mendes G. Prevalência do uso de medicamentos na gravidez: uma abordagem farmacoepidemiológica. *Rev Saúde Pública*. 2002;36(2):205-12.
19. Pavón PJ, Díaz MM, Mateu LL, Rojas GJ. Utilización de antimicrobianos en el Hogar materno Doña Leonor Pérez durante el período 2007-2009. *Rev Cuba Farm*. 2013;47(1):86-98.
20. Rang HP, Dale MM, Ritter JM. *Farmacologia*. 7a ed. Rio de Janeiro: Guanabara Koogan; 2012. Cap. 43; p. 576-93.
21. Fiol FSD, Toledo MI. Cefalosporinas. Ministério da Saúde (BR), Secretaria de Ciência, Tecnologia e Insumos Estratégicos, Departamento de Assistência Farmacêutica e Insumos Estratégicos. *Formulário terapêutico nacional 2010: Rename 2010*. Brasília: Ministério da Saúde; 2010. p. 117-9.
22. Machado A, Barros E. Antibacterianos. In: Barros E, Barros HMT. *Medicamentos na prática clínica*. Porto Alegre: Artmed; 2010. p. 396-478.
23. Farina SS, Fiol FSD. Imidazólicos. In: Ministério da Saúde (BR), Secretaria de Ciência, Tecnologia e Insumos Estratégicos, Departamento de Assistência Farmacêutica e Insumos Estratégicos. *Formulário terapêutico nacional 2010: Rename 2010*. Brasília: Ministério da Saúde; 2010. p. 126-7.

- 24 Arrais PSD, Barreto ML, Coelho HLL. Aspectos dos processos de prescrição e dispensação de medicamentos na percepção do paciente: estudo de base populacional em Fortaleza, Ceará, Brasil. Cad Saúde Pública 2007; 23(4):927-37.

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