

Urinary tract infection during gestation and its correlation with low back pain versus nursing interventions*

Infecção urinária na gestação e sua correlação com a dor lombar versus intervenções de enfermagem

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ABSTRACT

BACKGROUND AND OBJECTIVES: This study aimed at evaluating the prevalence of urinary tract infection (UTI) during pregnancy and its correlation with low back pain, as well as at analyzing prenatal assistance and orientations provided by two nurses during pregnant women assistance.

METHOD: This was a transversal, exploratory and descriptive study carried out with 124 pregnant women divided in 2 comparative groups (GI and GII), who received prenatal assistance in different moments by different professionals in a Family Health Unit between June 2009 and June 2010. Data were collected through perinatal records and semi-structured questionnaire.

RESULTS: Data analysis has shown that most pregnant women were aged between 20 and 29 years (67%), education has varied from no education (42%) to elementary school (33%). GI had 42% prevalence of UTI and GII 33%. As to genital hygiene habits, it has been observed that 17% of GI patients would not carry out any genital hygiene after vesical and intestinal eliminations and intercourse during pregnancy. In GII, 66% would carry out genital hygiene. Other study data have shown that 100% of GI patients have reported not having attended orientation groups during prenatal assistance versus 100% attendance of GII. As to low back pain, 85% of GI women and 84% of GII women with UTI have referred low back pain, being this association statistically significant.

CONCLUSION: The prevalence of UTI during gestation was 42% for GI and 33% for GII. Low back pain was the primary symptom reported by patients with confirmed UTI. There has been progressive spread of health and education knowledge during prenatal assistance provided by the GII professional with possible association with decreased incidence of UTI. This study proposes a topographic low back pain evaluation during patient's history for early UTI diagnosis and its potential association with low back pain; and suggests more emphasis on educational ac-

tions during prenatal assistance as a possible determining factor to decrease UTI during gestation.

Keywords: Pregnant women, Prevalence of urinary tract infection, Urinary tract infection.

RESUMO

JUSTIFICATIVA E OBJETIVOS: O objetivo deste estudo foi verificar a prevalência de infecção urinária (ITU) na gravidez e sua correlação com a dor lombar, bem como analisar a assistência pré-natal e orientações prestadas por duas enfermeiras durante o atendimento à gestante.

MÉTODO: Estudo transversal, exploratório e com abordagem descritiva realizado com 124 gestantes – divididas em 2 grupos comparativos (GI e GII) que receberam assistência pré-natal em momentos distintos por profissionais diferentes em uma Unidade de Saúde da Família entre junho de 2009 e junho de 2010. Os dados foram coletados por meio de ficha perinatal e questionário semiestruturado.

RESULTADOS: A análise dos dados demonstrou que a maior proporção das gestantes estava entre 20 e 29 anos (67%), a escolaridade variou entre nenhuma (42%) ao ensino fundamental (33%). O GI apresentou ocorrência de ITU em 42% e o GII, em 33%. Quanto aos hábitos de higiene genital, evidenciou-se no GI que 17% não realizavam nenhuma higiene genital após eliminações vesicointestinais e coito na gravidez. Já no GII, 66% realizavam higiene da região genital. Outro dado da pesquisa mostrou que 100% das gestantes do GI relataram não ter participado de grupos de orientação durante assistência pré-natal *versus* 100% de participação do GII. Quanto à dor lombar, verificou-se que 85% das mulheres que apresentaram ITU no GI referiram dor lombar e 84% do GII também relataram a mesma queixa, sendo essa associação estatisticamente significativa.

CONCLUSÃO: A prevalência de ITU na gestação foi de 42% para o GI e 33% para o GII. A lombalgia foi a principal sintomatologia referida pelas gestantes com diagnóstico confirmado de ITU. Observou-se progressiva difusão dos conhecimentos em saúde e educação durante a assistência pré-natal prestada pelo profissional do GII com possível associação de redução de incidência de ITU. O estudo traz como proposta a investigação topográfica da dor lombar durante anamnese para o diagnóstico precoce de ITU e sua possível associação com a lombalgia e maior ênfase às ações educativas durante assistência pré-natal como possível fator determinante de redução de ITU na gestação.

Descritores: Gestantes, Infecção do trato urinário, Prevalência de infecção do trato urinário.

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INTRODUCTION

Urinary tract infection (UTI) is a very frequent and common disease which may be present at any age. In adulthood, 48% of women have at least one UTI episode, and higher susceptibility is due to shorter urethra, more closeness of the anus to the vaginal vestibule and urethra and beginning of sexual activity¹.

Specifically during gestation, women go through many emotional, physical and physiological changes which make them more vulnerable to UTI. This is the third more common clinical intercurrent during gestation, affecting 10% to 12% of pregnant women. Urinary tract infection in pregnant women is even more concerning when asymptomatic because exactly for going unnoticed, this condition may lead to premature delivery and hospitalization of the mother. Asymptomatic bacteriuria (AB) in early pregnancy is also a risk for subsequent pyelonephritis. When symptomatic, the infection is also important however its diagnosis is faster due to the presence of symptoms which are defined according to the type of urinary tract infection. In some types of infections, low back pain may be the most reported clinical manifestation²⁻⁵.

Among bacterial strains able to cause UTI in pregnant women, *Escherichia coli* is the most common urinary pathogen, responsible for approximately 80% of cases. To clinically diagnose UTI during pregnancy, it is necessary to remember that some symptoms are difficult to be characterized since during pregnancy some of them might be present, such as urinary frequency and dysuria. Micturition urgency may be present but in a lower scale, affecting approximately 1% to 5% of pregnant women. However, such manifestations may also be present in cystitis and pyelonephritis by urethral epithelium irritation or as irradiated pain of a higher urinary tract infection process³.

Topographic infection history should be added to the diagnosis since, pedagogically, signs and symptoms are characteristic of each clinical presentation, but in practice such manifestations may confuse health professionals³.

UTI is a relevant source of maternal complications (cellulitis and perinephric abscess, urinary obstruction, pre-term labor, premature chorioamnionitis, anemia, chorioamnionitis, endometritis, preeclampsia, septic shock, multiple organs failure and death) and perinatal complications (prematurity, infection, periventricular leukomalacia, multiple organs failure and death)⁴.

There are evidences that history during prenatal visits allow the identification of pregnant women at higher risk for UTI. So, the Department of Health (DH) has implemented in 2002 the Prenatal and Birth Humanization Program (PHPN). This program emphasizes clinical and laboratory procedures pregnant women should go through during the prenatal period, focusing also on the identification of risk situations requiring immediate clinical care⁴. PHPN also aims at the progressive spread of health and education knowledge during the prenatal period. However, little is known about the knowledge pregnant women really have about this process⁴. For such,

the investigation about nursing guidance during the prenatal period was included in this study.

Low back pain is common in general population and is a frequent symptom in pregnant women with asymptomatic and symptomatic bacteriuria. Low back pain is considered one of the five commonest symptoms during pregnancy, especially as from the 3rd trimester. The prevalence of low back pain during pregnancy varies from 48% to 83%, according to some studies. World low back pain incidence in pregnant women is approximately 50%. Notwithstanding this high incidence, few data are reported by the literature about the pathophysiology and specific clinical manifestation of low back pain during pregnancy, probably because most health professionals consider it a normal and expected complaint during gestation. Low back pain etiology is multifactorial during gestation⁵⁻¹⁹. Low back pain affects from the last costal arch area to gluteal folds, and may unilaterally or bilaterally impair lower limbs by pain irradiation to that region. It has to be stressed that low back pain during pregnancy may be indicative of urinary tract infection. It may also be related to musculoskeletal system adaptations, influenced by the action of relaxin, which induces sacroiliac joint and pubic symphysis hypermotility making the pelvis unstable and contributing for low back pain. Conversely, low back pain may also be the single clinical manifestation of UTI⁵⁻¹⁸.

Prenatal assistance is a relevant moment to convey information to women and to look for important clinical manifestations during gestation. In countries such as Brazil, due to medical assistance precariousness, systematized tracking of health conditions of pregnant women and the adequate meeting of their health needs are very important aspects for the nursing team⁶.

The Brazilian DH, in its "Technical prenatal and puerperium manual", as well as in other PHPN-related publications, establishes that type I urinalysis and urine culture should be routinely requested in the first prenatal visit and that urine summary should be repeated in the third trimester of gestation. It is also mandatory that urine collection for the exam is done under judicious antiseptics^{6,7}.

So, the knowledge of the prevalence of UTI in pregnant women is closely related to PHPN essence, since it is the basis to assure minimum assistance parameters for pregnant women, educating and making women more participative of the prenatal, delivery and puerperium follow-up process.

Considering literature data about UTI as risk factor for maternal and perinatal morbidity and mortality, we have evaluated the relevance of answering the question of the research: which is the prevalence of urinary tract infection during pregnancy and its correlation with low back pain? In addition to analyzing the activities developed by two nurses during prenatal assistance.

METHOD

This is a transversal quantitative study aiming at describing the activities of two nurses (I and II) in different periods

(2009-2010) during prenatal assistance⁸. The study was carried out in a Family Health Unit of the Cabo do Campo village, located in the municipality of Tupanatinga, PE.

Participated in this study 124 pregnant women (census sample) who entered prenatal assistance between June 2009 and June 2010. Studied population was divided in two groups: Group I (GI) – 62 pregnant women who started prenatal assistance in the second semester of 2009 and were assisted for six months by nurse I; and Group II (GII) – 62 pregnant women who started prenatal assistance in the first semester of 2010 and were assisted by nurse II.

After signing the Free and Informed Consent Term (FICT), the perinatal records of participants were analyzed, in addition to interviews with the groups who have answered a questionnaire with closed and open questions on guidelines given by nurses I and II during the prenatal period about: self-care, identification of risk situations for UTI, correlation of UTI and low back pain and understanding the importance of urinalysis and culture, results, and their participation in prenatal guidance groups, among other variables.

Microsoft Excel electronic spreadsheet was used to develop a database, which allowed the organization of data in tables. SPSS (Statistical Package for the Social Sciences 13.0) was used for statistical analysis, with 95% statistical reliability. Chi-square test was used to evaluate the association between low back pain and UTI, considering statistically significant $p < 0.05$.

This study was approved by the Research Ethics Committee, School of the Caruaruense Association of Higher Education, Caruaru, Pernambuco, process 0065.0.217.000-2010.

RESULTS

Using information obtained from used tools and after treating data, most relevant statements to understand the questions orienting the objectives of this study were selected.

Table 1 shows major socioeconomic and demographic characteristics of pregnant women of this study. Most patients (67%) were aged from 20 to 29 years. A significant number of pregnant women had no education (42%). With regard to occupation, most pregnant women (58%) have reported working in agriculture.

Table 2 shows characteristics of prenatal assistance, parity, types of previous deliveries and abortion. It was observed that most pregnant women had six or more consultations in a total of 88%.

With regard to previous deliveries, this study has shown that 72% had vaginal delivery and 28% Cesarean sections.

As to abortions, the study has shown that 80% of patients have not referred abortions and 12% have reported two or more abortions.

Table 3 summarizes the incidence of UTI during pregnancy, treatment and referral of these patients to risk prenatal assistance. In our research, the incidence of UTI confirmed by simple urinalysis and urine culture was 42% for GI and 33% for GII. There has been 0.9% decrease in UTI incidence from

GI to GII. The study has also concluded that 80% of pregnant women (Group I) with UTI and assisted by nurse I were treated, while 100% of GII patients developing UTI during gestation were treated. It was also observed that 60% of GI patients with UTI were referred to risk prenatal assistance. In GII, 75% of patients were referred.

With regard to hygiene habits after vesical and intestinal eliminations and intercourse during pregnancy, most GI patients (50%) would use toilet paper cleaning from front to

Table 1 – Distribution of studied pregnant women according to socioeconomic and demographic variables.

Variables	Categories	%
Age (years)	Up to 19	12
	20-29	67
	30 or above	21
Education	None	42
	Basic education	33
	High school	25
	College	00
Occupation	Housewife	25
	Agriculture	58
	Paid job	08
	Others	09

Table 2 – Distribution of obstetric, gynecologic and prenatal assistance variables.

Variables	Categories	%
Prenatal	≤ 05 consultations	12
	≥ 06 consultations	46
	+ 07 consultations	42
Parity	0	25
	1	21
	2	29
	3 or more	25
Previous delivery	Vaginal delivery	72
	C-section	28
Abortion	0	80
	1	08
	2 or more	12

Table 3 – Distribution of symptom characteristics for the presence of urinary tract infection during pregnancy and treatment of patients.

Variables	Categories	%
Presence of urinary tract infection (confirmed)	2009 (Group I)	
	Yes	42
	No	58
	2010 (Group II)	
Treatment	Yes	33
	No	66
	2009 (Group I)	
	Yes	80
Refereed to risk prenatal assistance	No	20
	2010 (Group II)	
	Yes	100
	No	00
	2009 (Group I)	
	Yes	60
	No	40
	2010 (Group II)	
	Yes	75
	No	25

back, 33% from back to front and 17% would not do any hygiene. In GII, 83% used toilet paper from front to back, 17% from back to front and 66% would wash the genital region, according to guidelines of nurse II during prenatal visits.

It was also observed that behavior was different after evacuations and micturations in GI, with reversed direction of 33% to front to back and 50% to back to front. Only 16% of pregnant women would wash the genital region. In GII, however, micturition hygiene direction was preserved and there has been significant increase in genital region washing after evacuation (66%). With regard to hygiene habits before and after intercourse, 83% of GI patients have reported no genital hygiene, while 66% of GII patients did it.

Table 4 shows the level of guidance about the importance of urinalysis, collection, results and professional guidance during prenatal assistance. It was observed that GI had 92% deficit with regard to the importance of the exam and urine collection techniques, while GII had a higher level of information about the subject (83%).

As to results, GI has reported not knowing the result of the exam although having presented it to the professional. In GII, 66% stated having received information with interpretation of results. Another important data was that 100% of GI patients have not participated in guidance groups during prenatal assistance, while 100% of GII patients have participated.

Table 5 shows that 85.5% of GI patients with confirmed UTI diagnosis have referred low back pain. In GII the percentage was 84% and a small percentage (from 14.5% to 16%) of patients with confirmed UTI diagnosis has not referred low back pain in both groups. There has been statistically significant association between UTI and low back pain ($p < 0.001$).

Table 4 – Distribution of pregnant women with regard to laboratory tests, their results and participation in guidance groups.

Variables	Categories	%
Have received guidance about the importance and collection for urinalysis	2009 (Group I)	
	Yes	08
	No	92
	2010 (Group II)	
Were informed about exam results	Yes	83
	No	17
	2009 (Group I)	
	Yes	25
Have participated in Guidance Groups during the prenatal period	No	75
	2010 (Group II)	
	Yes	66
	No	33
Have participated in Guidance Groups during the prenatal period	2009 (Group I)	
	Yes	00
	No	100
	2010 (Group II)	
	Yes	100
	No	00

Table 5 – Distribution of patients who referred low back pain as major complaint.

Variables	Categories	n/ %
Patients with UTI diagnosis (confirmed) who referred low back pain	2009 (Group I)	
	Yes	53/85.5*
	No	9/14.5*
	2010 (Group II)	
Patients without UTI diagnosis who referred low back pain	Yes	52/84*
	No	10/16*
	2009 (Group I)	
	Yes	26/42*
	No	36/58*
	2010 (Group II)	
	Yes	40/64.5*
	No	22/35.5*

*Chi-square test ($p < 0.001$).

DISCUSSION

UTI frequency and severity during pregnancy have been recognized for more than one century. In addition to being a relatively common problem during gestation, several questions about the subject still remain controversial and are reasons for clinical investigations. The subject becomes relevant due to its association with worse maternal and perinatal prognoses and findings scarcely discussed in the literature, such as a Turkish study which has shown the prevalence of UTI in women with eight years of education or less³. These data are in line with our study where a significant number of pregnant women were illiterate or had incomplete basic education.

For many years, pregnancy was seen as a predisposing factor for all types of UTI. Currently it is known that pregnancy, as isolated event, is not responsible for a higher incidence of UTI⁸.

The DH recommends at least six medical visits during pregnancy. In Brazil, it has been observed that 77% of pregnant women had followed this guideline. In the case of Single Health System (SUS) users, the proportion was 74%. In our study, 42% of patients have attended seven or more consultations.

The World Health Organization (WHO) has considered that C-section rates above 15% are not justifiable¹². Face to high C-section rates in Brazil, the DH has established limits for the payment of C-sections by SUS in up to 30%. Nevertheless, Brazil has presented in 2002 a total of 39.9% C-sections, with regional differences. Data from the National Demographics and Health Research from 2006 have shown C-section rates, in SUS-paid deliveries, between 33.6% and 44% in different Brazilian regions¹⁰. Our study has shown C-section rate of 28%.

According to WHO data, six million abortions are made every year in Latin America, being 1.4 million just in Brazil. According to DH data, every year, 250 thousand women are admitted to SUS hospitals due to complications after illegal or spontaneous abortions. The abortion rate in Brazil is 35 to 40 abortions for every one thousand women¹¹. Our data have shown abortion rate of 20%. From 13% to 15% of maternal deaths as a consequence of pregnancy are related to abortion¹¹.

A recent study in São Paulo with puerperal women has observed that 66.8% had no UTI during pregnancy; however 33.2% have reported the disease¹². The incidence of UTI in our research has varied between both groups with 42% for GI and 33% for GII.

A study with British women has shown that 48% had the habit of cleaning the genital region after micturition in the anteroposterior sense and 44% would do it in the reverse sense. The study has concluded that the habit of cleaning external genital organs in the posteroanterior sense had a higher correlation with the incidence of UTI during gestation¹², which confirms the observations of our study.

Another national study about genital hygiene habits of pregnant women has shown that 50.5% of them would do genital hygiene after evacuations, cleaning with toilet paper or wet wipes with front to back movements; 7.7% would do it in the opposite direction and 0.9% would do no genital hygiene. The two latter habits favor vaginal and urethral region colonization by micro-organisms of the enteral flora and are determining factors for UTI and vulvovaginitis¹⁰. Investigators studying genital hygiene after vesical eliminations were unanimous about the recommendation of cleaning the genital region after vesical and intestinal eliminations in the anteroposterior sense, in unidirectional movements from the perineum to the anus and coccyx¹⁰.

Genital hygiene before intercourse is due to poor male hygiene which, in addition to including the inadequate penile washing before intercourse, may be related to intercourses in the presence of urethritis, condylomas and herpes. These diseases may bring severe early or late consequences for women. Early complications refer to the contamination by sexually transmitted disease agents and late for the possibility of evolving to cervical cancer¹³.

Our study has shown in both groups (GI 83% and GII 66%) a significant number of no genital hygiene before intercourse. It is believed that sexual practice increases in 40% the risk of developing UTI and is one of the commonest means of mechanical transportation of bacteria from the skin around the anus to vagina and urethra¹⁰⁻¹⁴.

It is important to orient pregnant women about healthy micturition practices such as: avoid delaying micturition and acquiring the habit of micturition before sleep and after intercourse because these practices may decrease bacterial multiplication time. Patients should also be oriented about increasing fluid ingestion and daily hygienic care, during bath, after micturition and evacuation and sexual practices, of low back pain investigation. These guidelines should be the focus of attention of health professionals along prenatal assistance^{6,7}.

Our study has shown that guidance deficit might be associated to the high prevalence of UTI during pregnancy. It was observed that GI and GII patients made their prenatal assistance according to DH recommendations, but only group II has received basic information. It is necessary to reinforce current recommendations for prenatal assistance, giving more emphasis to educational actions thus aiming at promoting

education and health during pregnancy¹⁰.

Data of our study about low back pain are in line with published studies which have shown that the prevalence of low back pain during gestation varies from 48% to 83%⁵. Another study on the prevalence of low back pain in pregnant women assisted in a clinic-school has also shown that 83.3% of patients had low back pain. The same study has evaluated pain intensity which, in 40% of pregnant women, was severe¹⁸.

Another recent study on the prevalence of low back pain in pregnant women has shown that 73% of them had this symptom. Complaints start as from the second trimester with a prevalence of 43% and worsen in the third trimester in 48% of patients, contributing for the incapacity to perform daily life activities¹⁹. Our study has shown a statistically significant association between low back pain and UTI. Low back pain may be a UTI symptom and may also be the single clinic manifestation of an upper UTI, such as pyelonephritis. However, we have not found studies observing a positive correlation between low back pain intensity and urinary tract infection.

Nursing teams still lack more knowledge about pain as clinical sign of diseases such as UTI. It is known that the responsibility given to nurses to deal with pain and the several aspects depending on them for quality assistance might help understanding the reason for the high valuation and concern with technical precision in pain¹⁶. The study has shown that the major UTI complaint was low back pain. In the light of this finding, several complications may be prevented if nurses understand pain as a major vital sign during gestation. The assistance to pain is complex, requiring both knowledge and skills to adequately perceive and treat pain¹⁸. So, the participation of nurses in prenatal programs implies their clinical qualification to identify real and potential problems during gestation.

CONCLUSION

Our study has shown that the prevalence of UTI during gestation was 42% for GI and 33% for GII. Low back pain was the major symptom referred by pregnant women with confirmed UTI. It was also observed that the progressive spread of health and education knowledge during the prenatal program carried out by nurse II could have been a determining factor for the decreased incidence of UTI in GII as compared to GI.

Some facts deserve health professionals' special attention, especially from nurses who are responsible, as Family Health Strategy team members, for low risk prenatal programs. One of them is genital and post-intercourse hygiene during gestation. The other fact is the recognition of UTI symptoms, such as low back pain, since data suggest significant correlation between UTI and low back pain.

This study has also shown a knowledge gap about the importance of urinalysis, collection and interpretation of results.

This study is a reflection about the quality of prenatal assistance and proposes the importance that should be given to educational activities during prenatal assistance and to the simplest complaints through an effective communication

process. However, it is important to add that just guidance is not a guarantee for the absence of UTI during pregnancy. A qualitative history, including topographic pain evaluation, may cooperate for the early UTI diagnosis and prevent perinatal complications. Low back pain has to be valued since it is considered by health professionals a normal sign during pregnancy, who neglect prophylactic measures, which generates low back pain trivialization during gestation. Low back pain should be considered a disease which has to be duly evaluated and treated and attention is called for its association to urinary tract infections.

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