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EVALUATION OF THE RELATIONSHIP BETWEEN GENITAL HYGIENE BEHAVIORS AND URINARY TRACT INFECTIONS IN PRE-PREGNANCY AND THE FIRST TRIMESTER OF PREGNANCY

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ABSTRACT

Aim: We aimed to evaluate genital hygiene behaviors of pregnant women in their first trimester whohad come for routine pregnancy follow-up and to examine the relationship with urinary tract infections (UTI).

Methods: A total of 377 pregnant women over 18 years of age who attended the Sisli Hamidiye Etfal Hospital Gynecology and Obstetrics outpatient clinics for pregnancy follow-up between September 2020 and October 2020 were included in the study. The "Individual Information Form (IIF)" and "Genital Hygiene Behavior Scale (GHBS)" were administered to the participants.

Results: Pregnant women with a history of fewer vaginitis and urinary tract infection episodes before pregnancy had significantly higher GHBS scores.A total of 260 (69%) participants stated that they had knowledge about genital hygiene, and the GHB scores of these subjects were significantly higher than those who said they did not have any information ($p< 0.000$).

Conclusions: Determining the genital hygiene habits of pregnant women during pregnancy and identifying those who need counseling are important in terms of controlling genital infections. Pregnancy schools are an important option for education during pregnancy, but the main goal should be to provide such training before pregnancy.

Keywords: hygiene; urinary tract infections; vaginal douching; pregnancy trimester

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INTRODUCTION

Urinary Tract Infections (UTI) can be defined as the proliferation of causative microorganisms in the urinary tract and causing damage to their environment. UTI is more common in women than men. Between 50% and 60% of adult women will have at least one UTI during their life [1, 2].

During pregnancy, some physiological changes occur in women with the effect of hormones. Changes such as ureter dilatation, increased bladder capacity, and decreased bladder tone in the urinary systemmay cause urinary stasis, ureterovesical reflux, and dysfunctional voiding. In addition, an increase in glycosuria and progesterone seen in approximately 70% of pregnant women reduces urinary system resistance and causes bacterial growth. When insufficient genital hygiene behaviors are added to all these reasons, the incidence of UTI in pregnant women increases [3-5]. The rates of UTI during pregnancy are reported to be 5 to 10%. Some sources describe it as the most common health problem seen in pregnant women after anemia and the rate is reported to be around 20% [6, 7].

Urinary Tract Infections seen in pregnancy can cause serious health problems for both the mother and baby such as pyelonephritis, low birth weight, premature labor, hypertension, and preeclampsia, and it may increase the risk of perinatal death [8, 9]. Determining the risks and trying to reduce these risks with protective measures is therefore as important as diagnosis and treatment.

It is important to define genital hygiene behaviors (GHB) in pregnant women, to identify those who need training about these habits and practices, to develop correct genital hygiene behaviors, and to reduce urinary tract infections and thus complications [10].

In our study, we aimed to evaluate the GHB of pregnant women in their first trimester whohad come for routine pregnancy follow-up and to examine its relationship with UTI.

METHODS

A single-center, cross-sectional study was carried out in the outpatient gynecology and obstetrics clinics at Sisli Hamidiye Etfal Hospital. The study included all pregnant women over the age of eighteen who applied for pregnancy follow-up appointments at the outpatient clinics between September 2020 and October 2020, did not have multiple pregnancies, were in their first trimester, and gave their consent to participate in the research. Women with previously known congenital or acquired urinary system pathology were not included in the study. Ethical approval of the study was obtained from the Sisli Hamidiye Etfal Hospital Non-Contagious Clinical Research Ethics Committee on 06.08.2020 with decision number 624.

The sample size was calculated as over 1250 with 95% reliability, which is the number of applications to the outpatients clinics for this age group in the previous two months and it was planned to reach at least 295 patients.

A total of 377 pregnant women were enrolled in the study. Written consent was obtained from the participants. The "Individual Information Form (IIF)" and "Genital Hygiene Behavior Scale (GHBS)" were administered to the participants. Pregnant women were grouped as with and without UTI according to the results of dipstick urinalysis (UA) as requested in their routine examinations.

The researcher administered the IIF face-to-face to the individuals after obtaining their consent, and the GHBS was filled in by the women themselves in a separate room. The IIF consisted of 22 questions, and it was created by the authors as a result of a literature reviewin order to inquire about the sociodemographic characteristics, pregnancy histories, and genital behaviors of the participants.

Genital Hygiene Behavior Scale (GHBS) was developed by Karahan in 2017 and consists of 23 items and three subscales. The subscales are"General Hygiene Habits (GHH) (first 12 questions)", "Menstrual Hygiene Awareness (MHA) (questions 13–20)", and "Abnormal Findings Awareness" (questions 21–23)". Scale items are scored by giving numerical values from 5 to 1,corresponding to "totally agree" and "totally disagree", respectively. The 7th, 14th, 19th, 20th, and 23rd items of the scale are scored in reverse. The lowest score that can be obtained from the scale is 23 and the highest score is 115, and high scores are associated with positive genital hygiene behavior. Cronbach's alpha value for the entire scale was found to be 0.80 [11].

The American College of Obstetricians and Gynecologists states that dipstick urinalysis for leukocyte esterase or nitrite is a rapid and inexpensive screening test, with a sensitivity of 75 percent and specificity of 82 percent [12]. We planned our study by accepting patients with leukocyte esterase or nitrite positivity in dipstick analysis as having urinary tract infection.

Statistical analysis

Statistical data analysis was carried out in the SPSS 20.0 package program. In addition to descriptive statistics (frequency, percentage, mean, standard deviation), the Kolmogorov-Smirnov test was used to determine whether the data showed a normal distribution, the Independent Sample t test was used for normally distributed data, and the Mann-Whitney U test and the Kruskal-Wallis H test were used for data that did not show normal distribution. Variables affecting the risk of urinary tract infection were examined with Multivariate Logistic Regression Analysis. $P < 0.05$ was considered statistically significant.

RESULTS

A total of 377 pregnant women were included in our study; the mean age was 29.60 ± 6.37 years (min: 17, max: 48), the average height was 163.46 ± 6.42 centimeters (min: 145, max: 186), the average weight was 67.96 ± 13.07 kilograms (min: 40, max: 105), and the BMI average was calculated as 25.50 ± 4.96 kg/m² (min: 15.62, max: 42.06). Distribution of the participants

according to their sociodemographic characteristics is given in Table 1.

Table 1: Distribution of the participants according to their sociodemographic characteristics

		n	%
Education Level	Illiterate	7	1.9
	Below High School	109	28.9
	High School and Higher	261	69.2
Occupational Status	Working	157	41.6
	Not Working	220	58.4
Total Monthly Income[†]	Low	84	22.3
	Medium	229	60.7
	High	64	17.0
Living Area	Urban	349	92.6
	Rural	28	7.4
Family Structure	Nuclear	310	82.2
	Extended	67	17.8
Body Mass Index Classification	Underweight (<18.5 kg / m^2)	22	5.8
	Normal (18.5-24.99 kg / m^2)	166	44.0
	Overweight (25-29.99 kg/m^2)	127	33.7
	Obese (>30 kg/m^2)	62	16.4
Chronic Illness	None	306	81.2
	Hypertension	16	4.2
	Diabetes Mellitus	21	5.6
	Asthma/COPD	12	3.2
	Other	22	5.8
Total		377	100

[†] Income levels are determined by taking into consideration the minimum wage level in Turkey[13]

The mean years of marriage of the participants were 5.57 ± 5.39, and their mean gestational week was 9.01 ± 2.29. When evaluated in terms of pregnancy histories, the mean number of pregnancies was found to be 2.07 ± 1.40, and the average number of children they had was 0.88 ± 1.15. A history of abortion was present in 56 (14.9%) participants.

When the genital hygiene behaviors of the participants were questioned, 260 (69%) claimed that they knew about genital hygiene, and 259 (68.7%) practiced vaginal douching for genital cleansing. A total of 33 (8.8%) subjects reported performing vaginal douching after their menstrual period, 39 (10.3%) after sexual intercourse, and 187 (49.6%) on a regular basis. Water was the most regularly utilized product for genital cleansing (n=185, 49.1%). Among the participants, 252 (66.8%) had experienced UTI before pregnancy and 158 (41.9%) had a history of vaginitis. According to the dipstick analysis performed during the follow-up, 128 (34%) had UTI.

The mean GHBS total score was 94.55 ± 12.30, the mean GHH score was 49.58 ± 6.56, the mean MHA score was 32.88 ± 5.47, and the mean AFA score was 11.95 ± 2.60. The relationship between sociodemographic characteristics and GHBS is presented in Table 2. Accordingly, there was a negative relationship with the total GHBS and age, number of pregnancies, and the number of children (p = 0.0006; 0.014; 0.005, respectively). The GHBS scores of those with high school or higher education, those with high income, those living in nuclear families, those living in urban areas, and those without chronic diseases were found to be significantly higher (p = 0.000; p = 0.0008; p = 0.005; p = 0.000; p = 0.000; p = 0.000, respectively).

Table 2: The Relationship Between Sociodemographic Characteristics and Genital Hygiene Behavior Scale

	General Hygiene Habits		Menstrual Hygiene Awareness		Abnormal Findings Awareness		Total Score	
	r	p	r	p	r	p	r	p
Age †	-.119	**0.021**	-.165	**0.001**	-.037	0.479	-.141	**0.006**
Total years of marriage†	-.068	0.189	-.121	**0.019**	-.015	0.765	-.091	0.076
Total number of pregnancies†	-.123	**0.017**	-.141	**0.006**	-0.003	.956	-.127	**0.014**
Total number of children†	-.146	**0.004**	-.154	**0.003**	-.002	0.959	-.145	**0.005**

A significant correlation was found between the body mass index (BMI) and GHBS ($p = 0.032$). When the post hoc test was applied to the relationship between BMI and GHBS, the GHB scores of the overweight and obese individuals were found to be significantly higher than the underweight participants. When the relationship between pre-pregnancy vaginitis and GHB score was examined, it was found that the GHB score of pregnant women with a history of vaginitis was significantly lower ($p = 0.043$). Individuals with UTI at the time of follow-up had lower GHB scores, but no statistically significant correlation was found ($p = 0.606$).

A total of 260 (69%) of the participants stated having knowledge about genital hygiene, and the GHB subscores and total scores of these subjects were significantly higher than those who said they did not have any information. ($p< 0.000$, $p< 0.000$, $p< 0.001$, $p< 0.000$, respectively). Again, 334 (88.6%) participants who thought it was important to possess correct genital hygiene behaviors had significantly higher GHB subscores and total scores compared to those who did not ($p< 0.000$, $p< 0.000$, $p< 0.000$, $p< 0.000$, respectively). After the post hoc test, the averages of those who said they had information about genital hygiene and who thought it was important to possess correct genital hygiene behavior resulted in significantly higher subscores and total score than the participants who responded otherwise. Participants stated that they mostly obtained information about genital hygiene from doctors-nurses and then from social media and the internet.

No significant correlation was found between vaginal douching status and GHB subscores and total score ($p = 0.890$, $p = 0.346$, $p = 0.063$, $p = 0.557$, respectively). There was no statistically significant difference between vaginal douching and pre-pregnancy UTI and vaginitis histories. According to the UA performed during the follow-up, no significant relationship was found between having UTI and vaginal douching. ($p = 0.356$)

Out of the 128 patients who were diagnosed with UTI during follow-up, 112 (44.4%) were diagnosed with UTI before pregnancy and 63 (39.9%) were diagnosed with vaginitis before pregnancy, and the difference was statistically significant ($p< 0.000$ and $p= 0.039$, respectively).

The evaluation of the relationship between the pre-pregnancy frequency of UTI, vaginitis, and GHBS is given in Table 3. When the post hoc test was applied, GHB scores were significantly lower in patients who had 5 or more UTI or vaginitis episodes before pregnancy compared to those who did not have any.

In Multivariate Logistic Regression Analysis; It was found that age, years of marriage, number of pregnancies, number of children and GHB scores were not statistically significantly effective in increasing the risk of urinary tract infection ($NR2=0.04$, $p=0.059$).

Table 3: The Evaluation of the Relationship Between the Pre-Pregnancy Frequency of Urinary Tract Infections, Vaginitis, and Genital Hygiene Behavior Scale

		General Hygiene Habits		Menstrual Hygiene Awareness		Abnormal Findings Awareness		Total Score	
Urinary Tract InfectionsHistory	1	50.95±6.49	**0.004**	34.34±4.78	**0.000**	12.16±2.32	0.053	97.76±11.35	**0.000**
	2-5	49.05±6.46		32.87±5.62		12.13±2.43		94.07±11.93	
	≥5	47.15±7.87		29.93±6.15		10.81±3.24		87.90±14.69	
Vaginitis History	1	50.92±6.96	**0.000**	33.07±5.42	**0.011**	12.08±2.49	0.327	96.08±12.90	**0.000**
	2-5	49.11±6.90		32.08±5.43		11.45±2.85		92.61±12.16	
	≥5	44.88±6.57		29.33±5.56		11.03±3.36		85.25±12.74	

DISCUSSION

Urinary tract infections are one of the most common causes of bacterial infections during pregnancy. The physiological changes seen in pregnant women constitute a risk factor in terms of urinary system infections, which may cause complications for the fetus and mother [13].

Erbil et al. found that the number of children, education level, and income level are factors affecting genital hygiene behavior [14]. Çalık et al. found that the use of correct genital hygiene practices decreasedas the age and total marriage years increased [15]. Furthermore, studies conducted in Turkey found a negative correlation between genital hygiene behavior and living in an extended family and a rural area [15, 16].The results in our study are consistent with these results.

Semins et al. found a significant relationship between a high BMI value and the pyelonephritis risk in their study [17].Therefore, individuals with high BMI should be evaluated in terms of UTI and their compliance with preventive recommendations should be increased. Although a study [16] found that correct genital hygiene practices decreased as BMI increased, the GHB scores of overweight and obese participantsin our studywere found to be significantly higher than

those of lean participants. This may be because these pregnant women are in the risk group and are followed up more frequently and also informed about GHB within the scope of preventive measures.

Culture, ethnicity, and religious beliefs are factors that affect vaginal douching. Women perform vaginal douching after menstruation and sexual intercourse to clean blood and sperm, prevent odor, and feel cleaner [10, 18, 19]. Consistent with our study, therates of vaginal douching has been found to be over 50% in other studies carried out in Turkey [20-22].

Although there are studies showing that the frequency of vaginal infections is higher in women who perform vaginal douching [23, 24], Karaer et al. found no significant relationship between previous vaginitis and pelvic inflammatory disease and vaginal douching in their study [22]. In another study in which the patients were followed for 4 years, no relationship was found between the development of Chlamydial/Gonococcal genital infection and VD [25]. In our study, we did not find a significant relationship between the frequency of vaginal douching and a history of UTI, vaginitis, or UTI at the time of follow-up. The determining factor may be whether the flora is affected by vaginal douching and the kind of product used. Similarly, there was no significant difference between vaginal flora change and the frequency of VD in a study conducted in Turkey [26]. Hutchinson et al. found a relationship between vaginal douching and bacterial vaginosis in women with already unbalanced flora, but they could not detect a relationship between vaginal douching and bacterial vaginosis in women with normal vaginal flora [27].

Studies support that more than 50% of women have had at least one urinary tract infection in their lifetime [2, 28]. Cangöl and Tokuç found higher infection rates in patients who cleaned the genital area from the back to the front [29]. Again, Hacıalioğlu et al. and Sevil et al. foundthat improper cleaning practices increased susceptibility to infection [21, 30]. In another study, the frequency of urinary tract infections in women who changed their underwear on a daily basis was found to be lower than women who changed their underwear less frequently [31]. Consistent with this, we found in our studythat GHB scores were significantly lower in patients who had 5 or more UTI or vaginitis episodes before pregnancy compared to those who did not have any.

A significant correlation was found between having UTI at the time of follow-up in pregnant women who had UTI or vaginitis before pregnancy in our study. The rate of pregnant women diagnosed with UTI at the time of follow-up was found to be 34%. In a study conducted with 2245 pregnant women in Turkey, the prevalence of UTI was determined as 36.5%, consistent with our study [32].

Although the GHB score was found to be low in patients with UTI at the time of follow-up in the current study, there was no significant

relationship. The reason may be that the risk of UTI during pregnancy is affected by many factors such as sociodemographic characteristicsand chronic diseases [33-35].

We believe that the fact that the significantly higher GHB in those who stated that they had information about genital hygiene in the current study was due to the fact that the information sources were healthcare workers in general. Mete et al. found that 19.2% of pregnant women learned vaginal douching from their relatives and family members [36]. Ege et al. stated that planned genital hygiene behavior education positively affected women's genital hygiene behaviors [37]. One of the most important components of preventive health care is health education. It is of great importance that all women go through a training on GHB, both individually and as a community.

When providing health education, it is extremely important to change the behavior of the individual, family, and society by taking into account their own expectations, priorities, traditions, beliefs and values, and perceptions of health and illness [21]. Öner et al. found in a study conducted with pregnant women with UTI that GHB scores after education werehigher than in the control group, and the symptom status of the education group was less than the presence of symptoms in the control group [38]. In a study conducted in the Philippines, it was found that the knowledge and practices of genital hygiene of pregnant women who were included in the health education program increased significantly afterwards [39]. In Turkey, the number of pregnancy schools that organize weekly training programs for pregnant women has increased in recent years, but their numbers are still insufficient. Accurate information is provided to pregnant women about the pregnancy process with the cooperation of experienced midwives and doctors in these facilities. However, we think that the main goal should be to start these trainings in the pre-pregnancy counseling and pregnancy preparation phase. Periodic follow-up of all women of reproductive age is carried out in family medicine clinics in our country. Pre-pregnancy follow-ups should be seen as an opportunity, and women should be provided information.

One of the limitations of our study is that we conducted our study in a city, in a single center, and with patients with relatively high socioeconomic status. In addition, the fact that we made the UTI decision based on dipstick urinalysis results without urine culture is another limitation.

Genital hygiene behavior is associated with age, education, income level, family type, living area, and presence of chronic disease in pregnant women. A significant positive correlation was found between the number of UTI and vaginitis episodes before pregnancy and the GHB scores, although the GHB score was low in those with UTI at the time of follow-up, and there was no significant relationship.

Determining the genital hygiene habits of pregnant women during pregnancy and identifying

those who need counseling are important in terms of controlling genital infections. Pregnancy schools are an important option for education during pregnancy, but the main thing is to provide such education before pregnancy.

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