Prevalence of Urinary Tract Infection and Some Factors Affected in Pregnant Women in Iran Karaj City 2013

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Abstract: A common problem during pregnancy was urinary tract infection. Variety of health behaviors on incidence of urinary tract infection in this period involved. Purpose of this study was to assess the prevalence of urinary tract infections in pregnant women and some factors effected. This is a cross-sectional study that was carried out on 180 pregnant women referring to Karaj health centers in 2013. Data collection include urine culture, questionnaire, demographic data and health knowledge, check list (including personal hygiene, sexual and food, urinary dietary habits) respectively. People with urinary tract infections, chronic diseases such as diabetes, anemia and sickle, immune suppressant drugs and recent antibiotic use were excluded and the data were analyzed. In this study 47.8% of the pregnant women level of education of diploma was observed. They have a good knowledge score was 6.1%. in this study 19.8% of the 180 women participating in the project were positive urine culture. E-coli infection in 80% of patients, respectively. Between knowledge and the incidence of infection was significant difference observed. Urinary habits and feeding habits of the people with the highest score to lowest score was for the prevention of urinary tract infection. The increase of knowledge and behavior such as proper health behaviors, sexual habits and prevention of urinary tract infections and dressed very important role in prevention of urinary tract infection. Habit nutrition more influence on urinary tract infection and confirmed.

Key words: Urinary Tract Infection · Pregnant women · Health behaviors

INTRODUCTION

Urinary tract infection is defined as multi action of organisms in the urinary tract. It is usually associated with presence of neutrophils and $> 10^5$ organisms per mili liter in mid stream sample of urin [1]. The organisms causing UTI in community include a): Escherichia coli. (about 75% of infection) b): Proteus c): Klebsiella spp d): Psedomonas spices e): Strepto cocci f): Staphylococcus epidermidis [2]. In women, the ascent of organisms into the bladder is easier than in men because of the relatively short urethra and absence of bactericidal prostatic secretions [2]. Sexsual intercourse may cause minor urethral trauma and transfer bacteria from the perineum into the bladder. Instrumentation of the bladder may also introduce organisms [3].

Pregnancy is one of the factors which increase the risk of UTI partly due to the pressure of gravid uterus on the ureters causing stasis of urine flow and is also attributed to the humoral and immunological changes during normal pregnancy [4]. During pregnancy there are a number of conditions associated with an increased prevalence of UTI [5]. UTI is common with varying prevalence by age, sexual activity and the presence of genitourinary abnormalities [6].

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In healthy women, the prevalence of bacteriuria increases with age from about 1 percent in females with 5 to 14 years of age to more than 20 percent in women at least 80 years of age [6].

The prevalence is higher among individuals in lower socioeconomic classes and those with a past history of UTI [3].

UTI is more common in primigravidae than multiparae, previous history of UTI increases the chance by 50%, precence of asymptomatic bacteria increases the chance by 25%, abnormality in the renaltract is found in about 25% [7]. The condition which predispose to UTI or the risk factors for UTI (urinary tract infection) are bladder out flow obstruction, gynaecolgical abnormalities eg, vesico-ureteric reflux [2]. After 18th weeks of gestation, compression of the ureters by the uterus at the level of pelvic brim is another factor contributing to dilation and stasis of urine. Ureteral peristalsis and bladder tone also reduce in pregnancy. Vesicoureteral reflux, history of recurrent UTI,diabetes mellitus, hyper-uricaemia also are important predisposing factors for UTI [4-7]. Because of these changes the frequency and the severity of UTI increases in pregnancy. The 16[th]week is the optimal time for a single screen of bacteriuria. It is estimated that 10 to 20% of all women will suffer acute infection of the urinary tract at some point of their life time[8]. About 2-10% of young women are susceptible to asymptomatic bacteriuria in pregnancy on routine screening and UTI complicates 1-3% of all pregnancies [4]. In pregnancy UTI carries risk of foetal loss, pre-term labour, intrauterine growth retardation, maternal anaemia and also the chance of recurrent infections [9]. Birth and delivery is one of the natural phenomena and a vital part of life cycle. And the final aim is for the mother to deliver a healthy child without any complications. Since one of threatening causes of this aim is urinary tract infection. The aim of this study was to assess the prevalence of urinary tract infections in pregnant women and some factors effected.

MATERIALS AND METHODS

This is a cross-sectional study that was carried out on 180 pregnant women referring to Karaj health centers in 2013. This study conducted from April to October 2013. The study population included pregnant women attending karaj Medical Centre. A random sampling method was used. A formula was used to calculate the sample size.

$$n = \frac{(Z_{1-\frac{\alpha}{2}})^2 . p.q}{d^2} = \frac{.4055}{0/0025} = 162 \cong 180$$

In this formula Z=score for 95% confidence interval = 1.96, p = prevalence UTI=12%, d = Tolerable error =0/05.

Inclusion criterion was women with during first trimester pregnancy and no infection of UTI. People with urinary tract infections, chronic diseases such as diabetes, anemia and sickle, immune suppressant drugs and recent antibiotic use were excluded.

The tool used for collecting the information was urine culture and multi choice questionnaire consisting of demographic information, health knowledge, attitude and behavior check list (including personal hygiene, sexual and dietary, dress, urine habits). The questionnaire has been proved and its validity and reliability have been studied before study. The data collection tool was a researcher-made questionnaire which had 24 questions in four sections including a section on demographic information, a section on knowledge (29 questions), a section on attitude (17 items) and section containing a check list on practice regarding UTI preventive behaviors (22 items). As for scoring, in the knowledge section, each correct answer scored 1 and each wrong answer scored zero. The section an attitude based on a 5-point likert scale. The score of each question ranged from 1 to 5 (Itotally agree=5, I agree=4, no idea=3, I disagree=2 and I totally disagree=1). The section contained the questions of the practice checklist on a 4-point Likert scale (never=0, seldom=1, often=2 and always=4).

In data analysis, the women scores of knowledge, attitude and practice regarding UTI were categorized as poor, average and good. The reliability of the questionnaire was assessed with Cronbach's alpha in a study on 30 women who were similar to the study population in terms of demographic characteristics. The Cronbach's alpha for knowledge, attitude and practice checklist was 0.79, 0.86 and 0.81, respectively. Credible published articles about UTI were used to prepare the questionnaire [3-9]. The content validity of the questionnaire was then confirmed by an expert in the field of midwife and physician.

Data Analysis: Data were entered in the computer, using analyzed using SPSS 18. The spearman and mann whitney U tests were used to perform and establish any statistical difference. Univariate analysis was used to determine the association. Probability values of < 0.05 were considered as statistically significant.

Ethical Considerations: This study was approved by Arak university of medical sciences ethics review board with number 91-138-4 for dissertation in master science

in health education. An informed consent was obtained before collection of urine specimens and results were used in the prevent of UTI in pregnant women's. Moreover the results of urine tests were sent to the responsible person as soon as possible so that the pregnant women could be benefited from the study.

RESULTS

Study Population and Prevalence of Bacteriuria: A total of 180 pregnant women were recruited in this study. The mean gestation age was 26 ±5.8 and 50% of the women was primipara.

In this study 85 participants 47.8% of the pregnant women level of education of diploma was observed. Other samples' demographic characteristics were shown in Table 1.

Urine Collection and Analysis: The pregnant women of different trimester who came for anternatal checkup were sent to the pathology and microbiology departman of kamalshahr central laboratory for Routine examination. Urine analysis and culture of urine. Mid-stream urine were collected on the same day of enrolment using sterile container (HIMedia laboratories Pvt. Limited, Mumbai, India). Most of the specimens were analyzed within an hour of collection. Urine analysis using urine dipstick (Mannheim GmbH, Germany) was done following manufacturer's instructions.

Urine analysis demonstrated white blood cell (pus cell) too numerous to count with presence of red blood cells. Blood agar, neutrient agar and Mac Con-Key's agar media were used for culture of urine. The presence of neutrophils and $> 10^5$ organisms per mili liter in mid stream sample of urine taken as a case of UTI.The organisms were identified by their growth character, colony morphology, gram staining, motility test and other biochemical characteristic. In this study 19.8% of 180 women participating in the project were positive urine culture.

In urine culture most of the organisms identified were Escherichia coli about 80% of infection, Staphylococcus aureus 11.4%,,enterococcus 5.7%,Proteus 2.9%.(Table2).

The finding of this study revealed that past history of UTI had association with UTI (P = 0.01).

Among 180 pregnant women, 35 (19.8%) were found to have significant bacteriuria. There was no association between maternal age, parity, gestational age, occupation, marital status and education with bacteriuria. They have a good knowledge score was 6.1%. Between knowledge

Table 1: Demographic characteristics of the women participating in the study

Personal information		No. subjects	Percent
Maternal age	<15-24	53	29
	25-34	98	54
	35-45	29	16
Parity	0-1	90	50
	2-3	82	45
	>4	8	4
Employment status	Yes	7	4
	No	173	96
Education	Academic	76	43
	Diploma	85	47
	Under diploma	19	10

Table 2: Isolation bacteria from culture. N=35

	Good		Moderate		Low	
CLASS ACT	N	%	N	%	N	%
Dietary habit	147	81.7	0	0	33	18.3
Food habit	24	13.3	109	60.6	47	26.1
urinary habit	79	43.9	57	31.7	44	24.4
Hygiene habit	137	76.1	42	23.3	1	0.6
Sexual habit	128	71.1	31	17.2	21	11.7
Action total	157	87.2	23	12.8	0	0

Table 3: Mean check list (including personal hygiene, sexual and food, urinary dietary habits)

Bacteria	N(%)
Escherichia coli	28(80)
Staphylococcus aureus	4(11)
Enterococcus	2(6)
Proteus	1(3)

and the incidence of infection was significant difference observed. Urinary habits and feeding habits of the people with the highest score to lowest score was for the prevention of urinary tract infection (Table3).

DISCUSSION

The study provided some important features of the pregnant women, especially of their socioeconomic condition and nutritional status. Different studies showed that early and intensive sex, ignorance of sex hygiene, repeated pregnancies and deliveries, abortions, bacterial vaginosis and anogenital infections are associated with urinary tract infections [2, 3, 7, 9].

Proposed factors to affect the frequency of bacteriuria during pregnancy include multiparity, gestational age, previous medical history of UTI and anatomic urinary tract abnormalities [4, 10-12]. In addition, socio-economic status, educational status, sexual activity and catheterization are also associated with increased

risk of UTI [4, 10-12]. In our study socioeconomic status, sexual activity and history of UTI were shown to be the associated risk factors with UTI among pregnant women.

One study showed that 11.8% becteriuric women develop symptoms of UTI during pregnancy, whereas only 3.2% of women whit sterile urine an initial screening did so and suggested that the 16th week is the optimal time for a single screen of bacteriuria [13]. The overall prevalence of bacteriuria among pregnant women in this study was 19.8 %. This is similar to the prevalence of UTI (16.4%) among pregnant women in northern Tanzania [14]. Different factors have been documented to contribute to UTI among pregnant women. These include age, parity, gestation age, level of education [12-15]. In this study there was no significant association between these factors and bacteriuria. Similar findings have been reported elsewhere [12]. E. coli strains were the most common isolate. Similar findings have been reported in northern Tanzania [16] *and elsewhere* [12-15]. Esch. coli comprised 55.5% of uropathogens isolated by Gupta et al in a large study of 1410 patients of UTI [17].

The prevalence of Staphylococcus aureus was also high (11.4%) in this study. This agrees with previous studies[18-19] which observed an increasing trend in the prevalence of Staphylococcus aureus infection among asymptomatic pregnant women. The other organisms isolated included Enterococcus species, Proteus species. They are less common organisms causing UTI [16].

The results showed that low socioeconomic status was one of the factors that were significantly associated with increased UTI. The frequency of UTI was higher among pregnant women who had family monthly income of less than 800$. Similarly study on the same study subject in Pakistan by Haider *et al*. [20] also showed that pregnant women who had low income level were more likely to have bacteriuria than those who had high socioeconomic income level. Another study in Egypt by Dimetry *et al*.[21] on UTI also showed the presence of association between low income level and UTI. This could be due to the relation of low socioeconomic status with nutrition and immunity especially in pregnant women. On the contrary some studies reported the insignificant association between UTI and socio economic status [12, 22].

In addition, the finding of this study revealed that past history of UTI had strong association with UTI. Similar findings were reported by Haider *et al.* [20] on UTI in Pakistan, Taher *et al*. [23] in Qatar and Sescon *et al*. [24] in Philippines among asymptomatic pregnant women. Masinde *et al* [25] also identified that past history of

UTI is a risk factor for UTI during pregnancy. But absence of association was reported by Hamdan *et al.* [26] in Sudan and by Kovavisarach *et al.* [22] in Thailand. Sexual activity was also the other associated risk factor that was found to be significantly associated with UTI. Pregnant women who had recent and more sexual intercourse were more likely to have UTI than women who had less intercourses. This may be due to sexual activity increases the chances of bacterial contamination of female urethra. Having intercourse may also cause UTI in women because bacteria can be pushed into the urethra [27].

CONCLUSION

The study concluded that 19.8% of the 180 women participating in the project were positive urine culture. The most predominant organisms were Escherichia coli and Staphylococcus aureus. In this study the chance of UTI was higher among pregnant women in the presence of associated risk factors such as low income level, past history of UTI and sexual activity. To minimize the complication of pregnancies, regular antenatal care should be taken and to ensure a normal pregnancy with delivery of a healthy baby from a healthy mother. The pregnant women should be educated about the physiology of pregnancy and to motivate the couple about the need of family planning. Moreover routine culture in the diagnosis of UTI among pregnant women at booking is important to prevent adverse outcome for the mother and child.

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