CLINICAL PROFILE AND RISK FACTORS OF URINARY TRACT INFECTION AMONG PREGNANT WOMEN DURING FIRST TRIMESTER

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Abstract

Background : Risk factors of Pregnancy is a stress that may reveal a variety of medical conditions which includes hypertension, metabolic syndrome, pre-eclampsia, gestational diabetes and ischemic heart disease etc. Urinary tract infection in first trimester is not uncommon with different risk factors. So the objective of the present study was to describe the clinical profile and risk factors of   urinary tract infections during 1st trimester of pregnancy. **Materials and methods:** A descriptive study was conducted in the Obstetric and Gynaecology Department of BGC Trust Medical College Hospital, Chittagong from 1st January to 30th August 2016. Total 100 women were selected to ascertain the frequency and pattern of urinary symptoms as well as the risk factors of Urinary Tract Infection (UTI) such as age, parity, past history of UTI and haemoglobin among women attending an antenatal clinic. All pregnant women at 1st trimester irrespective of age, parity and gestational age were included, while women with known underlying renal pathology, chronic renal disease, renal transplant, diabetes or taking immunosuppressant therapy were excluded. Informed consent was taken and data collected on a self designed proforma. All the women underwent complete examination of urine. Dipstick test was performed on midstream urine and urine was cultured incase of positive dipstick test and women with urinary symptoms. Data was analyzed on SPSS version 18. **Results:** Regarding age distribution of the patients and found more than a half (52.0%) of patients belonged to 20–25 years age group. The mean (±SD) age of the patients was 23.7±4.5 years with range from 16 to 32 years. Regarding the general examination it was observed that anxious was found 55(55.0%), mild anaemia 59(59.0%), fever 25(25.0%) and high respiratory rate 16(16.0%). Build, nutritional status, lungs and examination of breast shows normal of the studied patients. The mean (±SD) Hb% of the patients was 10.0±0.6 gm/dl with range from 9 to 11 gm/dl. The mean (±SD) total count of the patients was 8428.6±1746.9/cumm with range from 6000 to 10000 /cumm. The mean (±SD) differential count of the patients was 69.0±3.4% with range from 65 to 75. The mean (±SD) ESR of the patients was 43.6±5.4 mm in 1st hour with range from 30 to 50 mm and the mean (±SD) RBS was 95.7±8.7 mg/dl with range from 90 to120 mg/dl. Pseudomonas 23(23.0%) Klebsilla 15(15.0%) E. coli 45(45.0%) and Proteus 17(17.0%) isolated from urine of UTI after caesarean section cases. Abnormal voiding pattern 87 (40.3%). Illiteracy(15%) History of sexual activity(10%), Low socioeconomic (Monthly income < Tk. 10,000 / month) group(17%) Past history of UTI(5%) and Multiparity(14%) were found to be risk factors for UTI in 1st trimester in these women. **Conclusion:** The common urinary symptoms encountered in the studied women were abnormal voiding pattern followed by irritative symptoms. Majority of urinary symptoms were due to pregnancy related changes in the urinary system. Past history of UTI, sexual activity, lower socioeconomic group and multi parity were significant risk factors for UTI.

Key words

Risk factors; Clinical profile; Urinary tract infections.

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Introduction

Pregnancy is one of the most exciting times in a women's life and in a couple's relationship. Every woman wants to have the best possible pregnancy. Sometimes in pregnancy, problems may arise, affecting the health of the mother and fetus. Sometimes women may have health problems that arise during pregnancy and other women have health problems before they become pregnant that could lead to complications[1]. It is very important for women and her husband to receive health care before and during pregnancy to decrease the risk factors of pregnancy complications.

Risk factors are something that is likely to increase the chance of getting a disease[2]. Pregnancy adds a unique and at times challenging facet to the management of many diseases, while certain diseases or their treatments may have a significant negative effect on pregnancy. Complications during pregnancy and delivery are closely related to perinatal mortality and morbidity as well as maternal mortality. Low socio economic status and maternal smoking are examples of environmental risk factors for adverse pregnancy outcomes. Factors affecting pregnancy outcomes are socioeconomic status and other health related conditions and behavior. Different types of early pregnancy complications are early abortion, gestational trophoblatic disease, ectopic pregnancy and hyperemesis gravidarum. Risk factors for adverse pregnancy outcomes includes maternal age, stress, income, education, employment, housing, prenatal care utilization, smoking, alcohol consumption and marital status. Common risk factors are extreme of age, multiparity, different medical problems like diabetes mellitus[3].

Women who have symptoms related to the genitourinary system present daily in a typical family medicine practice. The most common complaints are dysuria, urgency, suprapubic discomfort, increased urinary frequency, and incontinence. In the vast majority of cases they are suffering from Urinary Tract Infection (UTI) specially in the 1st trimester of pregnancy.

Presence of organism more that 10^5/ml of urine is defined as urinary tract infection[4]. The organisms that cause UTI during pregnancy , are the same as those found in non pregnant patients. Escherichia coli accounts for 75% of infections. Other Gram negative organism such as Proteus mirabilis and Klebsiella pneumoniae are also common. Enterococci, Gardnerella vaginalis and Ureaplasma urealyticum, as well as Gram-positive organisms such as group B Streptococcus and Staphylococcus saprophyticus are less common causes of UTI[5].

The most important anatomic change in the urinary tract during pregnancy is the dilatation of the collecting system.Because of the change the frequency and severity of urinary tract infections increases.The renal handling of glucose is markedly altered during pregnancy and glucosuria frequently occur in the presence of normal blood glucose values.this happens because of the increased GFR combined with an impaired tubular reabsorption of glucose.Glucosuria is a factor that favors urinary tract infections during pregnancy[6].

Risk factors of UTI in 1st trimester of pregnancy is a stress that may reveal a variety of medical conditions which includes poor hygiene, hypertension, metabolic syndrome, pre-eclampsia, gestational diabetes and ischemic heart disease etc. Pregnancy is often associated with physiological deviation, in other circumstances would be considered pathologic[7].

Materials and methods

This was a cross sectional study conducted in Department of Obstetrics and Gynaecology of BGC Trust Medical College Hospital, Chittagong, Bangladesh. The study was conducted from 1st January to August 2016 in a duration of eight months. 100 pregnant women at first trimester having symptoms of UTI were selected who were visited in the outdoor or admitted in the indoor of the Department of Obstetrics and Gynaecology during this period. All consecutive subjects fulfilling inclusion and exclusion criteria were included in the study. Consecutive pregnant women who attended the Antenatal Care Clinic for the first time In 1st trimester of pregnancy was approached to participate in the study. Those with known underline Significant Medical disorders were excluded. The research protocol is approved by the thesis committee (Local Ethical Committee). All data was taken in performed questionnaire and form direct clinical evidence and included, history covering all relevance to this

study were taken, general examination, obstetrical examination, investigation, risk factors and complications. Data was collected through interviews and clinical assessment of patients with a present data collection sheet. After collection of required information data was checked and processed manually researcher, analyzed and edited by computer and simple statistical calculation was done by using percentage. After signing an informed consent, relevant medical, obstetrical and socio-demographic characteristics were gathered using pre-tested questionnaires. Every woman was inquired for history suggestive of UTI (Urgency, frequency, loin pain etc) and history of using antibiotics in the index pregnancy. Maternal weight, height, and Body Mass Index (BMI) was calculated as weight in kilograms divided by height in meters squared. Maternal haemoglobin was measured. Mid stream urine samples were collected using sterile container on the same day of enrolment. All the specimens were analyzed within an hour of collection using dipstick (Mannheim GmbH, Germany) following manufacturer's instructions, then samples were analyzed for culture and sensitivity. Data were entered in the computer using Statistical Package for Social Sciences (SPSS) for windows version 18 and double checked before analysis. Means and proportions of the socio-demographic and obstetrical characteristics were calculated and compared between the growth positive and negative groups using student 't' and χ^2 tests, respectively. Univariate and multivariate analysis were used with isolate positive group as dependent variable and socio-demographic and obstetrics variables as independent variables. Probability values of <0.05 were considered as statistically significant for all results.

Results

Table I : Age distribution of the study patients (n=100)

Age	Number of patients	Percentage
<20	18	18.0
20-25	52	52.0
26-30	22	22.0
>30	8	8.0
Mean ± SD	23.7±4.5	
Range (Min – max)	(16 -32)	

Table II: Distribution of the study patients according to general examination (n=100).

General examination	Number of patients	Percentage (%)
Appearance		
Anxious	55	55.0
Normal	45	45.0
Build		
Average	82	82.0
Nutrition		
Average	83	83.0
Anaemia		
Mild	59	59.0
Normal	41	41.0
Temperature		
High	25	25.0
Normal	75	75.0
Respiratory rate		
High	16	16.0
Normal	84	84.0
Lungs		
NAD	100	100.0
Examination of breast		
Shows normal	100	100.0

Table III : Distribution of the study patients according to lab parameters (n=100)

	Mean	±SD	Range (Min-max)
Hb% (gm/dl)	10.0	±0.6	(9 -11)
Total Count (/cumm)	8428.6	±1746.9	(6000-10000)
Differential Count (%)	69.0	±3.4	(65-75)
ESR (mm in 1st hour)	43.6	±5.4	(30-50)
RBS (gm/dl)	95.7	±8.7	(90-120)

Table IV : Organism isolated from urine of UTI cases (n=100).

Organism	Number of patients	Percentage
Pseudomonas	23	22.0
Klebsilla	15	15.0
E. Coli	45	45.0
Proteus	17	17.0
Total	100	100.0

Table V : Risk factors of UTI in first trimester

Organism	Number of patients	Percentage (%)
Abnormal voiding pattern	87	87.0
Illiteracy	15	15.0
History of sexual activity	10	10.0
Low socioeconomic group	17	17.0
Past history of UTI	5	5.0
Multiparity	14	14.0
Total	100	100.0

This table I shows age distribution of the patients and found more than a half (52.0%) of patients belonged to 20–25 years age group. The mean (±SD) age of the patients was 23.7±4.5 years with range from 16 to 32 years.

Regarding the general examination it was observed that anxious was found 55(55.0%), mild anaemia 59(59.0%), fever 25(25.0%) and high respiratory rate 16(16.0%). Build, nutritional status, lungs and examination of breast shows normal of the studied patients (Table II).

The mean (±SD) Hb% of the patients was 10.0±0.6 gm/dl with range from 9 to 11 gm/dl. The mean (±SD) total count of the patients was 8428.6±1746.9/cumm with range from 6000 to 10000 /cumm. The mean (±SD) differential count of the patients was 69.0±3.4% with range from 65 to 75. The mean (±SD) ESR of the patients was 43.6±5.4 mm in 1st hour with range from 30 to 50 mm and the mean (±SD) RBS was 95.7±8.7 mg/dl with range from 90 to120 mg/dl (Table III).

This table IV shows the Pseudomonas 23(23.0%) Klebsilla 15(15.0%) E. coli 45(45.0%) and Proteus 17(17.0%) isolated from urine of UTI after caesarean section cases.

Table V showing Abnormal voiding pattern 87 (40.3%). Illiteracy(15%) History of sexual activity(10%) Low socioeconomic (Monthly income < Tk 10,000 / month) group (17%) Past history of UTI(5%) and Multiparity (14%) were found to be risk factors for UTI in 1st trimester in these women.

Discussion
This cross sectional study was carried out with an aim to find out the pattern of risk factors and clinical profile of Urinary Tract Infection (UTI) among pregnant women during first trimester.

A total of 100 patients age more than 18 years who were admitted or came in outdoor visit during 1st trimester of their pregnancy having symptoms of UTI in the Department of Obstetrics and Gynaecology of BGC Trust Medical College Hospital were included in the present study.

In this current study it was observed that the mean (±SD) age of the patients was 23.7±4.5 years with range from 16 to 32 years and more than a half (52.0%) of patients belonged to 20–25 years of age group. Hamdan et al (2011) showed the mean (SD) age of their urinary tract infection patients was 27.5±14.6 years[8]. Similarly, Akinloye et al (2006) shown the mean age of the patients in the study was 26.8±5.8 years with range from 16-40 years[9]. Tugrul et al (2005) found urinary tract infection was more frequent in patients over age 25 years[4].

Regarding the general examination it was observed in this current study that anxious was found 55.0%, mild anaemia 59.0%, fever 25.0% and high respiratory rate 16.0%. Build, nutritional status, lungs and examination of breast shows normal of the all studied patients. Almost similar findings obtained by Dimetry et al[10].

In this present series it was observed that the mean (±SD) Hb% of the patients was 10.0±0.6 gm/dl with range from 9 to 11 gm/dl. Evaluation of UTI in relation to haemoglobin showed by Haider et al (2010) that 90.0% women to be anaemic while 10.0% had haemoglobin level >11 gm/dl[11]. The mean (±SD) total count was found in this study patients was 8428.6±1746.9 cumm with range from 6000 to 10000 cumm. The mean (±SD) differential count of the patients was 69.0±3.4% with range from 65 to 75. The mean (±SD) ESR of the patients was 43.6±5.4 mm in 1st hour with range from 30 to 50 mm and the mean (±SD) RBS was 95.7±8.7 mg/dl with range from 90 to120 mg/dl.

In this current series it was observed that Pseudomonas 23.0%, Klebsilla 15.0%, E. coli 45.0% and Proteus 17.0% isolated from urine of UTI after caesarean section cases. Hamdan et al (2011) have shown E. coli was the most common pathogen (77.7% of the Gram-negative isolates, 42.4% of all isolate)[8]. Blomberg et al (2005) obtained that E. coli was 38% of the Gram-negative isolates and 25% of all isolate[15]. Haider

et al (2010) have shown the same findings in India and Pakistan respectively[11]. Some studies also have reported high resistance of E. coli towards different antimicrobials in Latin American and Costa Rica[12-15]. Although, S. aureus was known for years as rare urinary isolate reported by Arpi et al (1984), recently it has been reported to be the most frequent pathogen among pregnant women in Nigeria (Akinloye et al 2006)[16,9]. Ajido et al. (2006) showed 31.6% of the urinary samples produced positive culture. Gram negative enteric bacilli predominated. E coli was isolated in 27.5% of positive cultures and Staphylococcus saprophyticus in 11.0%. The organisms were sensitive to third generation cepholosporines (>90.0%), and amoxicillin in about 50% of cases.

Regarding risk factor analysis Abnormal voiding pattern 87 (40.3%). Illiteracy(15%) History of sexual activity(10%) Low socioeconomic (Monthly income < Tk 10,000 / month) group (17%) Past history of UTI(5%) and Multiparity(14%) were found to be risk factors for UTI in 1st trimester in these women. Abnormal voiding pattern was the strongest risk factor in our study. Pastore et al identified two strongest predictors of bacteriuria at prenatal care to be antepartum UTI prior to prenatal care and a prepregnancy history of UTI[17]. Same was observed by Sheikh et al[18]. This study also showed a high figure of UTI in women with a abnormal voiding pattern and positive past history of UTI. Maternal age was not found to be a significant risk factor in this study. In literature, only a slightly increasing risk of 1-2% is reported per decade of age which did not become evident probably due to a small sample size.

Conclusion

We can say that the commonest urinary symptoms in pregnancy was abnormal voiding pattern followed by irritative manifestation. Majority of urinary symptoms were due to pregnancy related changes in urinary system. Past history of UTI, sexual activity, lower socioeconomic group and multi parity were significant risk factors for UTI.

Disclosure

All the authors declared no competing interest.

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