

## The Pattern of Urinary Tract Symptoms During Pregnancy

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### ABSTRACT

**Objective:** During pregnancy remarkable changes occur, in structure and functions of urinary tract. These changes often predispose to the development of urinary tract disorder or may predispose to worsening of renal disease and its sequelae. Our objective was to determine the pattern of urinary tract symptoms during pregnancy.

**Methodology:** This descriptive study included 520 pregnant patients, out of 2134 admitted in the antenatal and labour wards of the Department of Obstetrics and Gynecology, Unit-III, Liaquat University Hospital, Hyderabad from 1<sup>st</sup> April 2006 to 31<sup>st</sup> March 2007. Women with history of diabetes, chronic renal failure or complaining of urinary symptoms before index pregnancy were excluded. Other variables of study were urinary symptomatology. All women underwent complete examination of urine through various tests including culture and sensitivity.

**Results:** During the study period, 520 patients were analyzed. Out of these, 49 (9.4%) patients were diagnosed as having urinary problems. Urinary tract infections were diagnosed in 34 out of 520 (6.5%) gravidas, acute renal failure in 11 (2.1%), nephrolithiasis in 2 (0.4%), acute urinary retention in 2 (0.4%) of patients. Majority of the patients belonged to the age group 21-25 years. Majority were multi gravidas and in the third trimester. Data analysis of our study showed that 316 (60.8%) of the study population reported the symptom of frequency of micturition. Stress incontinence and voiding difficulties were reported by 37% and 35.2% respectively.

**Conclusion:** Common urinary problems in pregnancy are urinary tract infections, acute renal failure, nephrolithiasis, and acute retention of urine. Common symptoms are frequency of micturition, stress incontinence and voiding difficulties.

**KEY WORDS:** Pattern, Urinary tract, Symptomatology, Pregnancy.

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### INTRODUCTION

Remarkable changes occur in structure and function of the urinary tract during pregnancy including increase in blood volume, increase in the glomerular filtration (GFR) and urinary output. The ureters undergo tonic relaxation<sup>1,2</sup> due to mass production of hormones, particularly progesterone. This loss in tone, along with the increased urinary tract volume, results in urinary stasis. Urinary stasis and the presence of vesicoureteral reflux in some women predispose them to upper urinary tract infection and acute pyelonephritis.<sup>3</sup>

Increased urine excretion during pregnancy, decreased bladder capacity and raised intravascular pressure has been blamed for frequent occurrence

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of lower urinary tract symptoms.<sup>4</sup> Urinary tract infections are one of the most common medical problem complicating pregnancy.<sup>5</sup> Numerous studies during the past three decades have reported association between urinary tract infection during pregnancy and adverse outcomes, including pyelonephritis, anemia, renal failure and hypertension in mothers; and preterm delivery, fetal growth restriction, low birth weight, and fetal death in infants.<sup>6</sup> Asymptomatic bacteriuria occurs in 2-11% of pregnancies.<sup>7</sup> Although pregnancy does not increase the risk of bacteriuria, it does increase the risk of pyelonephritis which in turn, poses risk to mother and fetus.<sup>8</sup> The incidence of acute renal failure has declined over recent decade in the western countries as a result of both improved antenatal care that had reduced complications, such as post abortal sepsis<sup>9,10</sup>, eclampsia, hypovolemia and severe hemorrhage and more successful early intervention in the management of complicated pregnancies. In contrast to this situation, the incidence of acute renal failure of obstetric origin continues to be common in developing countries and responsible of great materno-fetal morbidity, and high mortality rate surpassing 50%.<sup>11</sup>

Urinary calculi occur in one in 1000 pregnancies<sup>12</sup> and renal calculi are the major cause of non-obstetrically related abdominal pain during pregnancy.<sup>13</sup> Unlike in the developed world, the data on urinary problems during pregnancy are inadequate and fragmentary in the developing world especially in Pakistan, thus making the assessment and description of urinary tract problems a difficult task. Hence, paucity of data for Pakistan prompted us to conduct the study. This paper reports the patterns of Urinary Tract Infection during Pregnancy in Tertiary Care Teaching Hospital, Hyderabad, Pakistan.

### METHODOLOGY

A hospital based observational (cross-sectional) study of urinary problems during pregnancy was carried out between April 2006 and March 2007 at the Department of Obstetrics and Gynaecology, Unit-III of Liaquat University Hospital on patients who were admitted in the antenatal and labour wards. Patients with history of diabetes mellitus, chronic renal failure or pregnant women complaining of symptoms pertaining to lower urinary tract before the index pregnancy, or who had taken antibiotics for urinary tract infections within the last four weeks were excluded from study. Data were collected using a predesigned proforma.

After briefing the study subjects and taking the informed consent, a predesigned proforma was

applied for detailed history regarding symptomatology related to urinary problems. For instance, frequency of micturition, urgency, dysuria, stress, urge incontinence and voiding difficulties. All pregnant patients included in the study were asked to collect a mid stream urine sample in a sterilized bottle after cleaning the vulva with plain water or catheter specimen was taken. The specimen was sent for physical, biochemical and histopathological analysis including culture and sensitivity. Other relevant investigations included were, Full blood count, random blood sugar, blood urea, serum creatinine, serum uric acid, Serum electrolytes, Liver function tests, Coagulation profile, 24-hour urinary protein, Ultra sound scan of lower abdomen and cardiotocography.

General physical, clinical, and Obstetrical examinations were carried out. All women with severe pre-eclampsia, or APH, and PPH underwent a standardized management protocol. Patients with acute renal failure were referred to the urology ward after therapeutic termination of pregnancy for further management. Women who were transferred to the renal unit for dialysis, renal ward charts were analyzed, recorded and followed up for presumed recovery of renal function. Data analysis was done by calculating frequencies and percentages. The study was approved by Ethics Committee of Liaquat University of Health Sciences.

### RESULTS

During the study period, 520 patients were analyzed. Out of these, 49 (9.4%) patients were diagnosed as having urinary problems. Mean age of patients was 26 years with youngest being 16 years and oldest being 40 year of age. Out of 520 patient, 306(59%) were multi-gravidas having 2-4 children. Frequency of urinary complaints increased with increase in gestational age as 75.5% patients were in last trimester of gestation and 18.1% were in first

Table-I: Frequency of different urinary problems in pregnancy (n=520).

<i>Condition</i>	<i>No. of Patients</i>	<i>%</i>
Urinary tract infection	34	6.5%
- Cystitis and Urethritis	25	4.8%
- Acute pyelonephritis	06	1.2%
- Asymptomatic bacteriuria	03	0.5%
Acute renal failure	11	2.1%
Renal calculus disease	02	0.4%
Acute urinary retention	02	0.4%

trimester. Urinary tract infections were diagnosed in 34 out of 520 (6.5%) gravidas, acute renal failure in 11 (2.1%), nephrolithiasis in 2(0.4%), acute urinary retention in 2(0.4%) of patients (Table-I).

Analysis of symptoms showed that many patients experienced more than one symptoms. The most common symptoms were frequency of micturition 316(60.8%), stress incontinence and voiding difficulties were next common complained by 192(37%) and 182(35%) respectively. Common causes of acute renal failure were eclampsia, preeclampsia and prolonged intrauterine death (Table-II). Initially all patients with acute renal failure were managed conservatively, among those, three patients required transient dialysis, and three patients died. (Table-III)

## DISCUSSION

Urinary tract problems during pregnancy are fairly common in our country. Out of 520 selected cases, urinary tract infection was the commonest urinary problems during pregnancy. Pregnancy is a predisposing factor for UTI and pregnant women suffering from this pathology are exposed to dangerous risks. In the present series 34 out of 520 (6.5%) patient had UTI. This is significantly lower than reported by Net JT et al which was 18%.<sup>14</sup>

Diagnosis and treatment of asymptomatic bacteriuria (ASB) is important, as approximately 20-40% of these women, if untreated during pregnancy, will develop symptomatic UTIs.<sup>15-17</sup> Furthermore ASB is associated with preterm delivery. Our study shows that 3 out of 520 patients (0.57%) had ASB compared to other studies where the prevalence is very high.<sup>18</sup> Pregnancy- related acute renal failure (ARF) is rare<sup>19,20</sup> in developed countries because of safe and

Table-II: Urinary tract symptoms (n=520).

<i>Symptoms</i>	<i>No. of Patient</i>	<i>Percentage</i>
<b><i>Irritative Symptoms</i></b>		
Frequency of micturition	316	60.8%
Urgency	150	28.8%
Pain in lower abdomen	53	10.2%
Burning micturition	88	16.9%
Dysuria	53	10.2%
<b><i>Incontinence</i></b>		
Stress incontinence	191	36.7%
Urge incontinence	152	29.2%
<b><i>Voiding Difficulties</i></b>		
Difficulty in passing urine	45	8.7%
Incomplete emptying	138	26.5%
<b><i>Others</i></b>		
Oliguria	06	1.15%
Hematuria	05	0.9%
Affected	436	83%
Not affected	84	16.5%

early delivery of complicated pregnancies, more effective treatment of Preeclampsia, and disappearance of septic abortion.

In our study ARF is as frequent as 1 in 194 obstetric patients as compared to Drakely et al, who has found 1 in 1060 patients.<sup>9</sup> This study reflects higher rates of renal failure than does the study of Drakely et al. All of the patients of ARF were previously healthy. Acute renal failure occurred in association with Preeclampsia, eclampsia and prolonged intra uterine fetal death. Two patient with acute renal failure required dialysis therapy acutely because of moderate to severe azotemia but renal failure

Table-III: Data concerning 11 patients who had acute renal failure.

<i>S. No.</i>	<i>Age in Year</i>	<i>Parity</i>	<i>Gestational age in weeks</i>	<i>Primary cause</i>	<i>Management and outcome</i>	<i>Mode of delivery</i>	<i>Fetal out come</i>
1	22	2 <sup>nd</sup>	11	Septic abortion	Expired	Induced abortion	-
2	35	9 <sup>th</sup>	34	Post partum bleeding	Dialysis	SVD	Alive
3	28	4 <sup>th</sup>	38	Hepatorenal failure	Conservative	SVD	IUFD
4	20	4 <sup>th</sup>	40	Eclampsia	Conservative	Cesarean Section	Still born
5	25	PG	32	Pre eclampsia	Conservative	Cesarean Section	Alive
6	24	7 <sup>th</sup>	33	Pre Eclampsia	Conservative	SVD	NND
7	28	5 <sup>th</sup>	34	Eclampsia	Expired	SVD	IUFD
8	30	5 <sup>th</sup>	41	Abruptio placenta	Dialysis	SVD	IUFD
9	35	5 <sup>th</sup>	20	Eclampsia	Expired	Induced abortion	-
10	25	PG	24	Prolonged intra uterine death	Conservative	Induced labor	IUFD
11	25	PG	30	Prolonged intra uterine death	Conservative	Induced labor	IUFD

resolved postpartum with normal renal function. Eight patients recovered normal renal function after conservative management and two after transient dialysis therapy and three patients died.

Naqvi et al has reported that the most prevalent cause of acute renal failure was antepartum hemorrhage.<sup>21</sup> But our study showed prevalence of Preeclampsia as a cause of acute renal failure, and most severe forms of renal failure occurred in complicated Preeclampsia as shown by the study of Drakely et al.<sup>9</sup> However the diagnosis of superimposed Preeclampsia is difficult in patients with renal disease who may already have hypertension and proteinuria.<sup>22</sup> Preeclampsia often occurs early and with increased severity. Uric acid concentration in maternal serum may be the first sign that Preeclampsia has begun. Base line uric acid and creatinine levels in maternal serum should be obtained at 14-20 weeks of gestation in these patients. Deterioration of maternal renal function or uncontrolled hypertension is an indication for pregnancy termination.

Renal calculus diseases were present in 2(2.5%) of the parturients and both of these patients had pain in the renal area. Lewis et al reported an incidence of symptomatic renal calculi of 1 in 244 pregnancies<sup>23</sup> which is consistent with the findings of our study of 1 in 260 pregnancies. Both cases had microscopic hematuria. Ultrasound was the initial test used to confirm the diagnosis and the size of stones which were less than 5cm. No x-ray or IVU was required. Both patients were managed conservatively.

Urinary retention during pregnancy is rarely quoted in literature. This study showed 2(2.5%) obstetric patients had acute urinary retention. On admission, ultrasound scan revealed a retroverted gravid uterus. No fibroid or any other pelvic tumours were observed on ultrasound examination in association with a retroverted gravid uterus. Neither severe UTI nor other urological causes were diagnosed on investigations. No previous history of pelvic inflammatory diseases (PID) or abdomino pelvic surgery was obtained.

There is no universal protocol for the treatment of incarceration, but several techniques have been described. However the immediate treatment is to catheterize the patient and slow emptying of the bladder while the patient is kept in the prone position. Both patients were conservatively managed with transient catheterization. None of the patient required manual repositioning of uterus or pessary treatment. The analysis of symptoms showed that 431(83%) pregnant women gave history of at least one symptom. However majority of women gave history of more

than one symptom. Study by Cutner et al<sup>24</sup> showed that 100% pregnant women complained of urinary symptoms but only 47% of women complained of single or multiple problem related to lower urinary tract in the study of Najmi et al.<sup>4</sup>

The most commonly noticed symptom was increased frequency found in 316(60.8%) of the patients which is lower than the finding of Najmi et al who found that 83.59% of the women had diurnal and or nocturnal frequency.<sup>4</sup> The urinary frequency may be due to several etiological factors including increased fluid intake and subsequent urine output<sup>25</sup>, and mechanical factors such as the pressure exerted on the bladder by the pregnant uterus. In the third trimester a reduction in bladder capacity may further complicate the situation. However increased fluid intake is the single most important factor.

The second most common symptom was stress incontinence. This was present in 197(38%) gravidas. It is generally accepted that as pregnancy proceed a growing number of women complain of urinary incontinence and it affects 32-85% of gravidas.<sup>26,27</sup> Moreover, the degree of urinary incontinence worsens as pregnancy advances and it is associated with increasing parity. Therefore this problem should be detected and treated at an early stage, preferably after the birth of the first baby. However, the reliability of figures on the prevalence of incontinence in pregnancy is based on self-reporting of urinary incontinence in pregnancy. Urge incontinence affected 26% of women. The frequency of urge incontinence detected in other studies varied from 10-19%.<sup>4</sup>

These differences could be explained on the basis of racial factors, duration of pregnancy at which populations were examined and different definitions employed. Various studies have confirmed that a considerable proportion of women complain of urinary tract symptoms both during the first and second halves of pregnancy. Subjectively increased occurrence of lower urinary tract symptoms during pregnancy was examined objectively by various methods and urodynamic studies provided the evidence of increased prevalence of abnormal detrusor activity, which recovered after delivery.

*Limitations of the study:* Several potential limitations should be considered in interpreting the results of the present study. First, the study is limited by cross-sectional design; so, temporality (cause-and-effect relationships) cannot be established. It can, however, provide a clear snapshot of the current situation and may help improve the management and design of future studies to explore further. Second, this is a



hospital-based study in an urban set-up, which may not be representative and applicable to general population. However, this could provide a reasonably precise and reliable estimate of patterns of Urinary Tract Infection during Pregnancy.

## CONCLUSION AND RECOMMENDATIONS

It is concluded from present study that urinary problems such as infections, acute renal failure, kidney calculus disease, and acute urinary retention are common occurrence in pregnancy in our region. A qualitative urine analysis, a urine culture, and serial blood pressure determination are adequate to screen for urinary problems in pregnancy. Obstetric complications continue to be common causes of acute renal failure in developing countries.

So, the most effective measures are still the prevention and the management of obstetric complications. To improve the outcome, patients must be educated about the benefits of early prenatal care and given access to such care.

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