Antibiotherapy Choice in the Treatment of the Severe Forms of Urinary Tract Infections During Pregnancy

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Abstract : *Bacteriuria and urinary tract infection (UTI) are relatively common in pregnant women. It has been proven that bacteriuric patients have an increased incidence of acute pyelonephritis, premature labour and fetal loss. These complications can be avoided by proper eradication of UTI in early pregnancy, especially in gravidas suffering from diabetes mellitus and in those with previous UTI. The aim of this study was to investigate the antibiotherapy choice in the treatment of the severe forms of urinary infections in pregnancy. A retrospective study was made on 46 prospectively followed-up high risk pregnancy patients. The presence of bacteriuria was analyzed in relation to previous UTI (Group 1) and in relation to diabetes mellitus (Group 2). Urinary tract infections were found to be more frequent than microbial contamination (27:19), and microbes appeared more often in diabetic patients ($p<0.01$). The incidence of positive urine cultures were the highest in the third trimester gravidas, almost equally in both groups. Analyzing the microbial aspect of UTI causes it was found that E.coli predominates. This microbe was discovered in 70.37% of urine cultures, while Enterococcus, Klebsiella, P. mirabilis and Saprophytes were diagnosed less often. Pregnant women with confirmed infection received antibiotics according to antibiograms. Ten-day cephtriaxon therapy (2 g daily) resulted in sterile urine cultures in all the probands with no side effects for mother and fetus, while other antibiotics were less efficient. Therefore, we recommend this antibiotic for the treatment of UTI in high risk pregnancies. (Thai J Obstet Gynaecol 1993; 5:33-37.)*

Key words: antibiotics, urinary tract infection, pregnancy

The most common urogynaecologic disorders are lower urinary tract infection (UTI) and urinary incontinence. Only a few risk factors have been identified with either disorders, and they are the sources of much physical and emotional distress as well as a major health care cost[1].

The finding of asymptomatic bacteriuria, which is not necessarily associated with clinical inflammation of the urinary tract, is not a rare finding in pregnant women[2]. It has been reported that 4.6-7% of gravidas show evidence of asymptomatic bacteriuria at the time of their first antenatal

visit[3,4]. Kass[5] has published that there is an incidence of 40% clinical UTI among these bacteriuric patients and showed an increase in the incidence of acute pyelonephritis, premature labour and fetal loss. It is taught that these complications can be avoided by proper eradication of UTI in early pregnancy[6]. Ledger[7] reported that infection can cause premature labour. Most clinicians practice universal screening for gestational diabetes. It is well known that intensive fetal surveillance, elective delivery and high caesarean rates are common in pregnancies complicated by insulin-dependent diabetes mellitus[8,9]. Martinell et al[10] showed that the incidence of bacteriuria during first pregnancies was significantly greater in women with (9.47%) and without (6.27%) renal scarring after childhood urinary infection than in controls (1.2%). It is also proven that women with a history of previous UTI had a high incidence of bacteriuria during pregnancy, and those with renal scarring and persistent reflux were prone to develop acute pyelonephritis[10,11].

The aim of this study was to investigate the antibiotherapy choice in the treatment of severe forms of urinary tract infections during pregnancy.

Materials and Methods

The retrospective study was carried out during a period of two years on 46 prospectively follow-up gravidas hospitalized for the reason of developed urinary tract infection diagnosed throughout the laboratory screening of high risk pregnancies, at the Division of High Risk Pregnancy, University Clinical Center in Belgrade. The analyzed patients were divided into two groups: the first group comprised of the patients with previous urinary tract infections and the second one consisted of diabetic gravidas. Clean, voided mid-stream urine specimens were cultured quantitatively and isolated agents were identified by standard microbiological methods. In cases of significant bacteriuria (>100000 / ml) the antibiotic treatment in accordance with the result of the sensitivity tests was ordinated. After the treatment was finished, control urine cultures were performed. The success of the applied therapy as well as other obtained results, were cultivated by x^2 *test.*

Results

A retrospective study was made on prospectively follow-up patients with high risk pregnancy. The presence of bacteriuria was analyzed in relation to previous UTI (Group 1) and in relation to diabetes mellitus (Group 2). The results showed that infections appeared more frequently than bacterial contamination (27:19), and that microbes appeared more often in diabetic gravidas ($p<0.01$) (Table 1).

Analyzing the presence of bacteria in relation to gestational age, it was found that the incidence of positive urine cultures were highest in the third trimester gravidas, almost

Table 1 The presence of microbes in urine of studied high risk gravidas

Risk groups	Number of patients		
	Contamination	Infection	Total
I	7	9	16
II	12	18	30
Total	19	27	46

Table 2 Gestational age of patients with positive urine cultures

Groups	Trimesters			
	First	Second	Third	Total
I	4	2	10	16
II	6	12	12	30
Total	10	14	22	46

Table 4 Antibiotics treatment of severe forms of urinary infections in pregnancy

Antibiotics	Number of patients
Cephtriaxon	21
Benxilpenicillin	2
Ampicillin	2
Cephalexin	1
Gentamicin	1
Total	27

equally in both groups (Table 2).

Particular attention was paid to the causes of UTI. E.coli was found to predominate. This microbe was discovered in 70.37% of urine cultures, while Enterococcus, Klebsiella, P. mirabilis and Saprophytes were diagnosed less often. Statistical analyses have proven that the incidence of urinary E.coli was higher in diabetic patients ($p<0.05$) (Table 3).

Pregnant women with confirmed infection received antibiotics according to their antibiograms. The results are presented in Table 4. Cephtriaxon (2 g daily) was administered in 21, Benzilpenicilin and Ampicillin in two and Cephalexin and Gentamicin in one patient. Ten-day Cephtriaxon therapy resulted in sterile urine cultures in all the probands. Gravidas treated with Benzilpenicillin demonstrated high levels of Pseu-

Table 3 Urinary tract infections in studied patients

Groups	Microorganisms					
	E.coli	Enterococci	P. mirabilis	Klebsiella	Saprophytes	Total
I	5	2	1	/	1	9
II	14	/	/	1	3	18
Total	19	2	1	1	4	27

domonas aeruginosa in the control urine cultures, while Cephalexin showed to be inefficient, as the concentration of microbes was only slightly decreased, despite the therapy.

Discussion

It seems likely that the prevalence of bacteriuria among women increases during pregnancy. Symptomatic or clinical urinary tract infection (cystitis or pyelonephritis) occurs more frequently during pregnancy which suggests that factors exist which allow, more readily, proliferation of bacteria in urine[5,12]. This could be partially due to urinary stasis and also to pregnancy-induced changes in the composition of the urine which favors an increase in the rate of bacterial multiplication. Risk pregnancies are more inclined to this infection[6,10]. Our results also confirm that the incidence of urinary tract microorganisms increases with the progression of gestation. Lawson and Miller[3,4] reported an incidence of urinary tract infection of 3.1% among pregnant women with negative urine cultures and 27.7% among asymptomatic patients. Little[6] reported 25% incidence of acute pyelonephritis during pregnancy among asymptomatic group of gravidas. Golan et al[2] found asymptomatic bacteriuria in 5.9% of normal pregnancies, 12.5% among the diabetics and in 18.5% of the previous urinary tract infection patients. In our study, 9 patients (33.33%) were asymptomatic UTI, while bacterial contamination and infection was two times higher in diabetic gravidas than those with previous urinary tract inflammation. According to literature data the main cause is E.coli[7,13]. In our study, this microbe was found to be present in more than two-third of the examined specimens of urine (70.37%). The other microbes were considerably less often isolated. Matorras and co-workers[14] were especially interested in correlation between maternal diabetes and urinary infection produced by group B streptococcus. They revealed that urinary tract colonization with this microbe in diabetics was twice as high as in non-diabetics (20% versus 10.9%). In spite of this, none of the urine cultures showed the presence of this cause in concentrations over 100000/ml. Detrimental drug effects in pregnancy were described long ago. It is known that Polymixin has neurotoxic and nalicidic acid haemolytic effects. Sulphonamide therapy often results in nuclear icterus. More recent investigations point out beta-lactamase benefits, since their untoward effects to the fetus have not been described as yet[13]. Contemporary treatment of urinary infections also involves the treatment of asymptomatic bacteriuria, because it is known that 30-40% of untreated cases may develop acute pyelonephritis[9,12]. Some authors suggest single Amoxicillin doses of 3 g with eventual repetition four days later[13]. Some regimens of UTI management involves also a chronic suppressive therapy with 100 mg nitro-

furantoin in the evening[15]. In our study, Cephtriaxon has proved to be very efficient and reliable for the microbe eradication, with no side effects to mother and fetus. Even the first control urine cultures 10 days from the onset of the therapy have shown to be sterile. Therefore, we recommend this antibiotic for the treatment of UTI in high risk pregnancies.

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