

## COMPARISON BETWEEN CEPHALOTHIN AND AMPICILLIN + GENTAMICIN IN TREATMENT OF PYELONEPHRITIS IN PREGNANCY

Moramezi F<sup>1</sup>, Barati M<sup>2</sup>, Masihi S<sup>3</sup>

### ABSTRACT

**Objective:** Urinary tract infection is a common problem in pregnancy and its complications affect both pregnant woman and her fetus. Different treatment strategies have been suggested and some of them are less safe. This study compared the effectiveness of cephalothin treatment with ampicillin + gentamycin protocol.

**Methodology:** Sixty pregnant patients with pyelonephritis in Imam Khomeini and Razi hospitals in Ahwaz were randomized in two groups of 30 patients, one with cephalothin only treatment and the other with ampicillin+gentamycin. Both groups were compared in term of duration of fever, CVA tenderness, symptoms and length of stay in hospital.

**Results:** Cephalothin only group had less duration of fever, approximately eleven hours, which was statistically significant. Length of stay and symptoms' relief were also less in cephalothin only group but it had no statistical significance.

**Conclusion:** Cephalothin is a safe and effective remedy in the treatment of pyelonephritis in pregnancy and may be used as the first choice treatment even in severely ill patients.

**KEY WORDS:** UTI, Pregnancy, Cephalothin.

Pak J Med Sci October - December 2008 (Part-II) Vol. 24 No. 865-868

### How to cite this article:

Moramezi F, Barati M, Masihi S. Comparison between Cephalothin and Ampicillin+Gentamicin in treatment of pyelonephritis in pregnancy. Pak J Med Sci 2008;24(6):865-68.

## INTRODUCTION

Renal infection is a common medical disorder occurring in approximately 2% of pregnant women.<sup>1</sup> Thirty three percent of these women may have a recurrence during the same pregnancy.<sup>2</sup> Other studies show that in pregnant women, the incidence of UTI can be as high as 8 percent.<sup>3,4</sup> Dilatation of pyelocaliceal system and pressure effect of pregnancy predisposes pregnant women to urinary tract infection.<sup>1</sup> Another factor that increases the rate of infection is due to increased vesicoureteral reflux. Acute pyelonephritis is the leading cause of septic shock during pregnancy. The population incidence of renal infection varies and depends on the prevalence of covert bacteri-

1. Moramezi F. MD  
Assistant Professor of Obs & Gyn Department,  
Razi Hospital,  
Ahwaz - Iran.
2. Barati M. MD  
Assistant Professor of Obs & Gyn Department,  
Imamkhomeini Hospital,  
Ahwaz - Iran.
3. Masihi S. MD  
Assistant Professor of Obs & Gyn Department,  
Razi Hospital,  
Ahwaz - Iran.

Correspondence

Mojgan Barati  
E-mail: brati\_m@yahoo.com

\* Received for Publication: April 9, 2008

\* Accepted: September 6, 2008

uria and whether it is treated. Acute pyelonephritis predisposes pregnant women to severe complications like preterm labor, transient renal failure, ARDS, sepsis, shock and hematological disturbances.<sup>5</sup> Asymptomatic bacteriuria may predispose the patients and their fetuses to preterm labor and Low Birth Weight of Fetus.<sup>6</sup>

Neonatal outcomes that are associated with UTI include sepsis and pneumonia (specifically, group B streptococcus infection).<sup>7,8</sup> Different treatment strategies were suggested and some of them had lesser safety. Historically, ampicillin has been the drug of choice, but in recent years *E. coli* has become increasingly resistant to ampicillin.<sup>9</sup> Ampicillin resistance is found in 20 to 30 percent of *E. coli* cultured from urine in the outpatient setting.<sup>10</sup> In other studies Ampicillin resistance is reported about 46%.<sup>11</sup> Ceftriaxone is an expensive drug. In reference the choice of drug is empirical and ampicillin plus gentamycin, cephalothin or ceftriaxon could be used. A randomized study of 90 obstetric inpatients with pyelonephritis compared treatment with oral cephalixin to treatment with intravenous cephalothin (Keflin) and found no difference between the two groups in the success of therapy, infant birth weight or preterm deliveries.<sup>12</sup> Cephalothin only and ampicillin + gentamycin regimen have low cost.

Aminoglycoside must be added to ampicillin and serial determination of serum creatinine is important if this nephrotoxic drug given. In 1-2% of patients 8<sup>th</sup> nerve toxicity is reported by gentamycin.<sup>1</sup>

The neurotoxic effects are variable from long life hearing loss to tinnitus and ataxia. Selection of one antibiotic is difficult. There are a lot of drugs with different outcome and different side effects. If two or more drugs have the same efficacy, the drug with lesser toxicity is preferred. When selecting a drug for treatment, the point which must be considered are drug efficacy, drug toxicity, shorter duration, dosage and low cost of drug.<sup>13</sup>

Because of these reasons we compared the efficacy of two regimens of cephalothin and

ampicillin +gentamycin in the treatment of pyelonephritis in pregnancy.

## METHODOLOGY

This prospective study was conducted on pregnant women with pyelonephritis in Imam Khomeini and Razi hospital in Ahvaz from Jan. 2002 to Jan. 2004. The 60 patients were studied in two randomized groups of 30 patients. Group one was treated by cephalothin one gram intravenous every six hours and group two was treated by ampicillin one gram intravenous every six hours + gentamycin 80 mg intravenous every eight hours until cessation of fever and then changed the drug to cephalexin 500 mg every six hours by oral route in both groups. The time of discharge was 24 hours after cessation of fever.

Information which was collected at the first visit by questionnaire, include: age, parity, gestational age, temperature, urinary symptoms, flank pain, presence of nausea and vomiting. Additional information gathered during evaluation and treatment included duration of becoming afebrile, signs of recovery and improvement. Patients with positive clinical signs and negative urine culture weren't included in the study.

## RESULTS

Eighty three percent of patients were primiparus and 17% were multiparas. Fifty seven percent were in their second trimester, 15% in first trimester and 28% in third trimester. The most common symptoms at first visit was flank pain (57%) followed by chills and fever (48%) and lower urinary tract symptoms (13%) shown in Table-I.

Ninety five percent pyuria and 19% nitrate positive were found in patients' urine

Table-I: Percent of signs at admission

<i>Signs at admission time</i>	<i>Percent (%)</i>
CVA tenderness	97
Fever	92
Lower urinary tract signs	72
Nausea and vomiting	65

Table-II: comparison of symptoms relief time between two groups

<i>Clinical response</i>	<i>Ampicillin+ gentamycin (hour)</i>	<i>Cephalothin (hour)</i>
Duration of hospitalization	66	61.2
Lower urinary tract symptoms' relief time	23.7	22.5
CVA tenderness duration	44	36
Time of being afebrile	30	19

analysis. E/coli were isolated from the urine in 91% and Klebsiella in 9%. Laboratory sensitivity test detected ampicillin resistance in 68%, cephalothin resistance 40%, gentamycin resistance 18% and ceftriaxone resistance in 0%. Persistence fever was the cause of change of drug treatment in 5% of patients.

Mean body temperature in Group-1 was 38.51 and 38.3 in the other group before beginning the treatment. The duration of clinical improvement is shorter in Group-1 (Tables-II&III).

## DISCUSSION

As discussed before the mean body temperature in Group-1 before initiation of the treatment was slightly more than the other group (38.53 versus 38.51) but the afebrile time in Group-1 approximately 11 hours was shorter than the 2<sup>nd</sup> group (p value=0.01). Mean length of CVA tenderness and urinary symptom in cephalotin's group 8 hours and 1.2 hours was less than group two respectively (p value=0.07), but not statistically significant. Hospital stay in Group one was 4.8 hours less than group two but with no statistical meaning (P value=0.22). Most patients' in this study had flank pain followed by fever and chills. CVA tenderness were found in 71% of patients at right side, 22% bilateral and only 7% at left

Table-III: Amount of shorter symptom abate mean duration time in-group-1

<i>Signs</i>	<i>Time (hours)</i>
Fever	11
CVA tenderness	8
Admission time	4.8
Urinary symptoms	1.2

side. Nitrate positive was found in few patients, hence negative urine analysis isn't against diagnosis of pyelonephritis. In the present study E/coli was isolated in 91% and Klebsiella in 9% versus parkland hospital in which Ecoli was isolated in 77%, Klebsiella in 11% and proteus in 4%.<sup>14,15</sup> Ampicillin resistance in this study was found in 68%, cephalosporin resistance in 40%, gentamycin resistance in 18% and ceftriaxon resistance in 0% when compared with reference in which ampicillin resistance rate is 46%.<sup>11</sup> Persistence fever was the cause of change of antibiotic in 5% of patients. Response to treatment in both groups was 95%.

## CONCLUSION

The result of present study shows that cephalothin therapy is a good remedy as a first choice in the treatment of pyelonephritis in pregnancy even in severely ill patients.

## REFERENCES

- Cunningham FG. Renal and urinary tract disorders. Williams Obstetrics, 21<sup>st</sup> ed. U.S.A: MC Graw Hill company 2001;1253
- Gilstrap LC, Cunningham FG, Whalley PJ. Acute pyelonephritis in pregnancy: an anterospective study. *Obstet Gynecol* 1981;57:409-13.
- Patterson TF, Andriole VT. Bacteriuria in pregnancy. *Infect Dis Clin North Am* 1987;1:807-22.
- Mikhail MS, Anyaegbunam A. Lower urinary tract dysfunction in pregnancy: a review. *Obstet Gynecol Surv* 1995;50:675-83.
- Gilstrap LC, Ramin SM. Urinary tract infection during pregnancy. *Obstet Gynecol Clin North Am* 2001;28(3):581-91.
- Smail F. Antibiotic for asymptomatic bacteriuria in pregnancy. *Cochrane database Sust Rev* 2001;(2):CD000490.
- Hart A. Ampicillin resistant Escherichia Coli in gestation pyelonephritis. *J Infec Dis* 2001;15:183(10)1526-9.

8. Mead PJ, Harris RE. The incidence of group B beta hemolytic streptococcus in antepartum urinary tract infections. *Obstet Gynecol* 1978;51:412-4.
9. Peddie BA, Bailey RR, Wells JE. Resistance of urinary tract isolates of *Escherichia coli* to cotrimoxazole, sulphonamide, trimethoprim and ampicillin: An 11-year survey. *N Z Med J* 1987;100:341-2.
10. Sanders CC, Sanders WE Jr. Beta-lactam resistance in gram-negative bacteria: global trends and clinical impact. *Clin Infect Dis* 1992;15:824-39.
11. Wood EG, Dillon HC Jr. A prospective study of group B streptococcal bacteriuria in pregnancy. *Am J Obstet Gynecol* 1981;140:515-20.
12. Angel JL, O'Brien WF, Finan MA, Morales WJ, Lake M, Knuppel RA. Acute pyelonephritis in pregnancy: a prospective study of oral versus intravenous antibiotic therapy. *Obstet Gynecol* 1990;76:28-32.
13. Mandell G, Bennett JE, Mandell DR. Principles and practice of infectious Disease, 5<sup>th</sup> ed, Churchill Livingstone Philadelphia 2000;3:770.
14. Cunningham FG. Urinary tract infections complicating pregnancy. *Clin Obstet Gynecol* 1988;1:891.
15. Millar Lk, Wing DA, Paul RH, Grimes DA. Out patient treatment of pyelonephritis in pregnancy: A randomized controlled trial. *Obstet Gynecol* 1995;86:560.