

Factors Leading to Acute Kidney Injury in Third Trimester of Pregnant Females Visiting Allied Hospital Faisalabad

Bilal Javaid, Nosheen Adil, Warda Munawar

ABSTRACT

Objective: The objective of the study was to determine the frequency of factors leading to acute kidney injury in third trimester of pregnant females visiting Allied Hospital Faisalabad. **Study Design:** Cross sectional study. **Settings:** Nephrology ward, Allied Hospital, Faisalabad. **Duration:** 6 months From February 2017 to July 2017. **Methodology:** Due approval to conduct the study from ethical committee of the institute was obtained. Population included in this study was subjected to fulfillment of inclusion/exclusion criteria. A thorough history of the participants was taken and a complete physical examination was also performed. Blood samples in a disposable syringe were obtained for examination through hospital laboratory. Puerperal sepsis, postpartum hemorrhage and pre-eclampsia were assessed as per operational definition by the researcher himself. **Results:** Mean age was 29.53±4.27 years, frequency of factors leading to acute kidney injury in third trimester of pregnant females was recorded as 56.67%(n=102) had Puerperal sepsis, 24.44%(n=44) had pre-eclampsia and 16.11%(n=29) had postpartum hemorrhage. **Conclusion:** In this study, frequency of factors leading to acute kidney injury in third trimester of pregnant females was higher in Puerperal sepsis followed by pre-eclampsia and postpartum hemorrhage.

Keywords: Pregnancy, third trimester, acute kidney injury, factors, Puerperal sepsis, pre-eclampsia, postpartum hemorrhage.

Corresponding Author

Dr. Bilal Javaid

Assistant Professor, Nephrology
Faisalabad Medical University,
Faisalabad-Pakistan
Contact: +92 321-7612484
Email: dr.bilaljavaid160@gmail.com

Submitted for Publication: 08-09-2018

Accepted for Publication: 23-11-2018

Article Citation: Javaid B, Adil N, Munawar W. Factors Leading to Acute Kidney Injury in Third Trimester of Pregnant Females Visiting Allied Hospital Faisalabad. APMC 2018;12(4):288-90.

INTRODUCTION

Pregnancy related acute kidney injury is responsible for a significant fetomaternal outcome.¹ Acute renal failure in pregnancy may cause a significant life-threatening issue.¹ Its incidence ranges from 2.3 to 4.5 per 10 000 pregnancies.² Pre-eclampsia, antepartum hemorrhage, postpartum hemorrhage, sepsis are the major risk factors of this morbidity.³ Postpartum hemorrhage resulting into hypovolemia and related organ failure is considered as responsible for increased risk of pregnancy related acute renal failure.⁴ Even small acute changes in kidney function may cause short and long-term outcome e.g. ERS, chronic kidney disease and death of the patient.⁵ Prerenal azotemia is another common risk factor of acute kidney injury in gestational period.⁶

According to a recent study significant increase in obstetric acute renal failure was particularly evident among those with gestational hypertension with significant proteinuria.² Etiological causes like previous septic abortion, may vary in undeveloped and developed nations.¹

In a recent international study, it was concluded that incidence of acute renal failure was 9.82% in late pregnancy and among them 63.1% had puerperal sepsis, 33.33% had pre-eclampsia and post-partum hemorrhage was recorded in 8%.⁷ In another study, puerperal sepsis was noted in 11.36% patients, pre-eclampsia was found in 63.6% patients⁸ and post-partum hemorrhage was present in 2% patients.⁹

There is controversy in literature regarding the risk factors of acute kidney injury during pregnancy. As acute kidney injury is related to grievous morbidity and mortality so by knowing the exact burden of its causes and risk factors in late pregnancy would help to prevent progression of disease and its complications.

METHODOLOGY

Study Design: Cross-sectional study.

Settings: Department of Nephrology, Allied Hospital, Faisalabad-Pakistan.

Duration: 6 months From February 2017 to July 2017.

Methods: This study consists of 180 cases. We included all females between 18-40 years of age presenting in third trimester with acute kidney injury. We excluded all cases with diabetes mellitus, chronic hypertension, glomerulonephritis, systemic lupus erythematosus, renal stones and hereditary nephritis and obstructive nephropathy. A thorough history of the participants was taken and a complete physical examination was also performed. Blood samples in a disposable syringe were obtained for examination through hospital laboratory. Puerperal sepsis, postpartum hemorrhage and pre-eclampsia were assessed as per operational definition.

The data analysis for age, parity, gestational age, puerperal sepsis, pre-eclampsia and postpartum hemorrhage was done. SPSS version 21 was used for data analysis.

RESULTS

Age distribution of the patients was done, 57.22%(n=103) were recorded between 18-30 years and 42.78%(n=77) were between 31-40 years, mean age was 29.53±4.27 yrs. (Table 1)

Table 1: Age distribution (n=180)

Age (in years)	No. of patients	%
18-30	103	57.22
31-40	77	42.78
Total	180	100

Mean±SD: 29.53±4.27

We found 83.33%(n=150) had ≤37 weeks of gestation and 16.67%(n=30) had >30 weeks of gestation, mean g. age was 33.21±4.38 weeks. (Table 2)

Table 2: Gestational age (n=180)

Gestational age (in weeks)	No. of patients	%
≤37	150	83.33
>37	30	16.67
Total	180	100

Mean±SD: 33.21±4.38

We found 93.89%(n=169) were between 1-3 parity and 6.11%(n=11) had >3 parity, mean±sd was calculated as 2.39±0.77 parity. (Table No. 3)

Table 3: Parity distribution (n=180)

Parity	No. of patients	%
1-3	169	93.89
>3	11	6.11
Total	180	100

Mean±SD: 2.39±0.77

Frequency of factors leading to acute kidney injury in third trimester of pregnant females was recorded as 56.67%(n=102) had Puerperal sepsis, 24.44%(n=44) had pre-eclampsia and 16.11%(n=29) had postpartum hemorrhage. (Table No. 4)

Table 4: Frequency of factors leading to acute kidney injury in third trimester of pregnant females (n=180)

Factors of acute kidney injury	No. of patients	%
Puerperal sepsis	102	56.67
Pre-eclampsia	44	24.44
Postpartum hemorrhage	29	16.11

DISCUSSION

There is controversy in literature regarding the risk factors of acute kidney injury during pregnancy. As acute kidney injury is related to grievous morbidity and mortality so exact burden of its causes and risk factors in late pregnancy should thoroughly be explored to prevent progression of disease and its complications.

Frequency of factors leading to acute kidney injury in third trimester of pregnant females was recorded as 56.67%(n=102) had Puerperal sepsis, 24.44%(n=44) had pre-eclampsia and 16.11%(n=29) had postpartum hemorrhage.

In a recent international study, it was concluded that incidence of acute renal failure was 9.82% in late pregnancy and among them 63.1% had puerperal sepsis, 33.33% had pre-eclampsia and post-partum hemorrhage was recorded in 8%.⁷ These findings correspond to our results.

In another study, puerperal sepsis was noted in 11.36% patients, pre-eclampsia was found in 63.6% patients⁸ and post-partum hemorrhage was present in 2% patients.⁹ It is not in-line with our study.

Another recent study¹⁰ in India reveals that Sepsis (59%), pre-eclampsia, and eclampsia (56%) were the leading causes of PRAKI, while sepsis was the leading cause of maternal mortality.

Sivakumar and others highlighted sepsis as a potential cause recorded in various Indian studies in last few years.¹¹

Pathogenesis of sepsis-induced renal dysfunction is not well understood. It has been seen that septic Acute Kidney Injury may occur in presence of vasodilatation and marked Hyperemia; whereas renal ischemia is not necessary for the loss of GFR.¹² Various other inflammatory factors are recorded in ischemia cases which may contribute for the development of Acute Kidney Injury.

The risk of UTI is higher in pregnant females due to urinary stasis and altered anatomy. This may lead to urosepsis if not treated correctly and timely. Acute pyelonephritis may occur as part of urinary tract infection and may be severe enough to cause AKI as a result of sepsis or prerenal azotemia from vomiting. Improved availability and better management of abortion has led to decrease in the incidence of post-aortal sepsis especially in the developed countries. However, in developing countries, sepsis is still a major cause including septic abortions.¹³

It is not difficult to identify various factors proven to have a higher risk of preeclampsia during first prenatal visit.¹⁴ Several studies show that daily supplementation with magnesium, fish oil, vitamin C or E is not effective. Calcium supplementation in high-risk women and in those with a history of low calcium diet appears to reduce the risk of preeclampsia.

In summary, early detection and control of these factors may control the risk of AKI in pregnant women.



CONCLUSION

In this study, frequency of factors leading to acute kidney injury in third trimester of pregnant females was higher in Puerperal sepsis followed by pre-eclampsia and postpartum hemorrhage.

REFERENCES

1. Acharya A, Santos J, Linde B, Anis K. Acute kidney injury in pregnancy-current status. *Adv Chronic Kidney Dis*. 2013;20(3):215-22.
2. Mehrabadi A, Liu S, Bartholomew S, Hutcheon JA, Magee LA, Kramer MS, et al. Hypertensive disorders of pregnancy and the recent increase in obstetric acute renal failure in Canada: population based retrospective cohort study. *BMJ*. 2014;2(1);349-53.
3. Gurrieri C, Garovic VD, Gullo A, Bojanic K, Sprung J, Narr BJ. Kidney injury during pregnancy: associated comorbid conditions and outcomes. *Arch Gynecol Obstet*. 2012;286(3):567-73.
4. Lutomski JE, Byrne BM, Devane D, Greene RA. Increasing trends in atonic postpartum hemorrhage in Ireland: an 11-year population-based cohort study. *Br J Obstet Gynaecol*. 2012;119(3):306-14.
5. Lameire NH, Bagga A, Cruz D, De Maeseneer J, Endre Z, Kellum JA. Acute kidney injury: an increasing global concern. *Lancet*. 2013;382(9887):170-9.
6. Van Hook JW. Acute kidney injury during pregnancy. *Clin Obstet gynecol*. 2014;57(4):851-61.
7. Godara SM, Kute VB. Clinical profile and outcome of acute kidney injury related to pregnancy in developing countries: a single-center study from India. *Saudi J Kidney Dis Transpl*. 2014;25(4):906-11.
8. Kabbali N, Tachfouti N, Arrayhani M, Harandou M, Tagnaouti M, Bentata Y. Outcome assessment of pregnancy-related acute kidney injury in Morocco: a national prospective study. *Saudi J Kidney Dis Transpl*. 2015;26(3):619-24.
9. Gopalakrishnan N, Dhanapriya J, Muthukumar P, Sakthirajan R, Dineshkumar T, Thirumurugan S. Acute kidney injury in pregnancy-a single center experience. *Ren Fail*. 2015;37(9):1476-80.
10. Mahesh E, Puri S, Varma V, Madhyastha PR, Bande S, Gurudev KC. Pregnancy-related acute kidney injury: An analysis of 165 cases. *Indian J Nephrol*. 2017;27(2):113-7.
11. Sivakumar V, Sivaramakrishna G, Sainaresh VV, Sriramnaveen P, Kishore CK. Pregnancy-related acute renal failure: a ten-year experience. *Saudi J Kidney Dis Transpl*. 2011;22(2):352-3.
12. Bellomo R, Wan L, Langenberg C, Ishikawa K, May CN. Septic acute kidney injury: the glomerular arterioles. *Contrib Nephrol*. 2008;174:98-107.
13. Khanal N, Ahmed E, Akhtar F. Factors predicting the outcome of acute renal failure in pregnancy. *J Coll Physicians Surg Pak*. 2010;20(4):599-603.
14. Turner JA. Diagnosis and management of pre-eclampsia: an update. *Int J Womens Health*. 2010;2(1):327-37.

AUTHORSHIP AND CONTRIBUTION DECLARATION

AUTHORS	Contribution to The Paper	Signatures
Dr. Bilal Javaid Assistant Professor, Nephrology Faisalabad Medical University, Faisalabad	Principal Investigator, Article Author	
Dr. Nosheen Adil Post Graduate Trainee Registrar, Nephrology Allied Hospital, Faisalabad	Research Idea, Co-Author	
Dr. Warda Munawar Post Graduate Trainee Registrar, Nephrology Allied Hospital, Faisalabad	Co-Author	