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Research Article

**FACTORS LEADING TO ACUTE KIDNEY INJURY IN
THIRD TRIMESTER OF PREGNANT FEMALES VISITING
CIVIL HOSPITAL KARACHI****¹Dr. Muhammad Aqeeb, ² Dr. Rida Iqbal, ³ Dr. Amara Arshad**¹Sahiwal Medical College, Sahiwal²Sargodha Medical College, Sargodha³University Medical and Dental College, Faisalabad**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.

Duration of Study: The study conducted at Nephrology ward, Civil Hospital, Karachi, in the duration of 6 months from January 2014 to June 2014.

Methodology: After the approval of study from hospital ethics committee, an informed consent was taken from all the included cases. All the patients fulfilling inclusion criteria were subjected to the following common treatment: History was taken from all the included patients. Thorough physical examination was done. Blood tests were sent to hospital laboratory and reported by a pathologist. Puerperal sepsis, postpartum hemorrhage and pre-eclampsia were assessed as per operational definition by the researcher himself.

Results: In this study, out of 180 cases, 57.22%(n=103) were between 18-30 years of age whereas 42.78%(n=77) were between 31-40 years of age, mean±sd was calculated as 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 haemorrhage.

Conclusion: In this study, frequency of factors leading to acute kidney injury in third trimester of pregnant females was higher in Puerperal sepsis following pre-eclampsia and postpartum haemorrhage.

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

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INTRODUCTION:

Pregnancy related acute kidney injury causes significant maternal, fetal morbidity and mortality [1]. Obstetric acute renal failure, also referred to as pregnancy related acute kidney injury, is a serious and potentially life threatening complication of pregnancy [1]. Its incidence ranges from 2.3 to 4.5 per 10 000 pregnancies [2]. An obstetric acute renal failure is associated with a case fatality rate of 2.9%. Major risk factors for obstetric acute renal failure include chronic hypertensive disease, pre-eclampsia, postpartum hemorrhage, antepartum hemorrhage and sepsis [3]. Postpartum hemorrhage resulting into hypovolemia and related organ failure may have been responsible for the observed increase in obstetric acute renal failure [4]. Even small acute changes in kidney function can result in short-term and long-term complications, including chronic kidney disease, end-stage renal disease, and death.⁵Prerenal azotemia is another common cause of acute kidney injury in pregnancy.⁶According 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 of acute kidney injury differ between developed and developing countries, with thrombotic microangiopathies being common in the former and septic abortion and puerperal sepsis in the latter [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% patients [8] 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 should thoroughly be explored to prevent progression of disease and its complications.

METHODOLOGY:

This cross sectional study conducted at Nephrology ward, Civil Hospital, Karachi, consisting of 180 cases. We included all females between 18-40 years of in third trimester having acute kidney injury. We excluded all cases with diabetes mellitus, chronic hypertension, glomerulonephritis, systemic lupus erythematosus, renal stones and hereditary nephritis and obstructive nephropathy. History was taken from all the included patients. Thorough physical examination was done. Blood tests were sent to hospital laboratory and reported by a pathologist. Puerperal sepsis, postpartum hemorrhage and pre-eclampsia were assessed as per operational definition by myself. The data analysis for age, parity, gestational age, puerperal sepsis, pre-eclampsia and postpartum hemorrhage was done.

RESULTS:

Age distribution of the patients was done, it shows that 57.22 % (n=103) were between 18-30 years of age whereas 42.78% (n=77) were between 31-40 years of age, mean±sd was calculated as 29.53±4.27 years. (Table No. 1) Gestational age distribution shows that 83.33 % (n=150) had ≤37 weeks of gestation and 16.67% (n=30) had >30 weeks of gestation, mean±sd was calculated as 33.21±4.38 weeks. (Table No. 2) Parity distribution shows that 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) 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 haemorrhage. (Table No. 4)

Table No. 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	

Table No. 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	

Table No. 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	

Table No. 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 by knowing the exact burden of its causes and risk factors in late pregnancy should thoroughly be explored to prevent progression of disease and its complications. In this study, out of 180 cases, 57.22%(n=103) were between 18-30 years of age whereas 42.78%(n=77) were between 31-40 years of age, mean±sd was calculated as 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 haemorrhage. 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% patients [8] and post-partum hemorrhage was present in 2% patients [9]. It is not in-line with our study. Another recent study [10]. 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 reveals that sepsis is still a major cause including septic abortions and puerperal sepsis in several studies published from India over last decades [11]. Pathogenesis of sepsis-induced renal

dysfunction is still poorly understood. Though it has been demonstrated that septic AKI can occur in the setting of marked Hyperaemia and vasodilatation; and renal ischemia is not necessary for the loss of GFR [12] various inflammatory factors have also been shown to be generated following ischemia which contributes to development of AKI and ATN [13]. Experimental studies continue to report newer concepts for pathogenesis of septic AKI. Similar studies in man are required to confirm these experimental findings.

Pregnant women are at greater risk of urinary tract infection due to the altered anatomy and urinary stasis as discussed in previous sections. Untreated timely and correctly this can lead to urosepsis. 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-abortion sepsis especially in the developed countries.¹⁴ Sepsis is still a major cause including septic abortions and puerperal sepsis in developing countries.¹⁵ It is possible to identify several factors that have been proven to increase the risk of preeclampsia development at the first prenatal visit.¹⁶⁻¹⁸ The detection of pregnant women at high risk for preeclampsia involves tighter monitoring of the pregnancy evolution, and some preventive measures may be indicated. Several studies show that daily supplementation with magnesium, fish oil, vitamin C or E is not effective [19]. Calcium supplementation in

high-risk women and in those with a history of low calcium diet appears to reduce the risk of preeclampsia [20]. A meta-analysis published by the Perinatal Antiplatelet Review of International Studies (PARIS) group demonstrated a moderate but consistent reduction in the relative risk of preeclampsia with aspirin use [21,222]. 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 following pre-eclampsia and postpartum haemorrhage.

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