



Research Paper

Assessment of Etiology of renal failure in pregnancy in Tertiary Care Centre

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I. Introduction

- 1.Obstetrics renal failure, also known as pregnancy related acute kidney injury, is a critically and potentially life-threatening complication of pregnancy.
- 2.Several anatomical and physiological adaptations are happening in the kidneys during the course of normal pregnancy.
- 3.The awareness of these physiological changes in pregnancy is of utmost clinical dominance.
- 4.Serum creatinine of 1.0mg/dl and BUN of 13mg/dl would be recognized as a normal value in non-pregnant individuals, but it reflects renal impairment during pregnancy
- 5.PR-AKI (Pregnancy related acute kidney injury) is a heterogeneous disorder with multiple etiologies that can occur at any time during pregnancy and in the postpartum period.
- 6.Major risk factors for obstetrics renal failure are preeclampsia, chronic hypertensive disorders, antepartum haemorrhage, postpartum haemorrhage, sepsis, and other infections.
- 7.The risk profile for pregnancy related acute kidney injury decreases due to good antenatal care, decline in sepsis-associated with abortion and child birth.

AIMS AND OBJECTIVES

- To assess the aetiology of renal failure in pregnancy.
- To assess maternal outcome.
- To assess fetal outcome

INCLUSION CRITERIA :

- 1.Patients who presented or developed renal failure during hospital stay were included in the study.
- 2.Puerperal women with renal failure.
- 3.Pregnant women having preexisting renal failure or renal transplant cases.

CRITERIA FOR RENAL FAILURE : • Serum creatinine >1.5 mg/dl

- Blood urea >40 mg/dl
- Urine output <400 ml in a 24-hour duration
- Need for dialysis.

EXCLUSION CRITERIA :

- Age of more than 45 years.
- The patient not given consent for study

II. Materials And Methods

STUDY DESIGN: Hospital-based prospective observational study.

STUDY SETTING: Tertiary care hospital at government general hospital Kakinada.

STUDY SUBJECT: Pregnant and puerperal women with acute renal failure or preexisting renal disease, developing renal failure during pregnancy.

METHODOLOGY:

1. Informed consent was taken from the study subjects involved in the study
2. Detailed history, clinical examination, and relevant laboratory investigation would be carried out for the pregnant and puerperal women developing renal failure or existing renal failure.
3. Laboratory investigations: blood urea, serum creatinine, serum uric acid, electrolytes, liver function test, complete blood count, bleeding time, clotting time, P.T.A.P.T.T., INR when indicated, abdominopelvic and obstetrical ultrasound, urine routine are done.

III. Results

This is a prospective observational study . The total number of cases in my study were 30.

Age distribution of cases:

A.G.E. (YEARS)	Number of patients (n=30)	Percentage
<20	2	6.7%
20-25	16	53.3%
26-30	8	26.7%
31-40	4	13.3%
Total	30	100%

Distribution of cases according to parity :

Parity	No of patients (n=30)	Percentage
Primi	12	40%
P2	12	40%
P3	5	16.7%
>= P4	1	3.3%
Total	30	100%

Distribution of cases according to trimester

GESTATION	NOOFCASES(N=30)	PERCENTAGE
SECONDTRIMESTER	2	6.7%
THIRDTRIMESTER	17	56.7%

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PUERPERIUM	9	30%
PASTDATES	2	6.7%
TOTAL	30	100%

Distribution of cases according to presenting complaints at the time of admission

Symptoms	Numberofpatients	Percentage
Reducedurineoutput	4	13.3%
Anuria	2	6.7%
Edemaoffeet	13	43.3%
Bleedingpervaginum	8	26.7%
Fever	4	13.3%
Abdominalpain	16	53.3%
Breathlessness	4	13.3%
Vomiting	4	13.3%
Loosestools	4	13.3%
Hypertension	6	20%
Alteredensorium	2	6.7%
Jaundice	5	16.7%

Distribution of cases according to primary etiological factor :

Primaryetiologicalfactor	Numberofpatients	Percentage
Preeclampsia	5	16.7%
Imminenteclampsia	2	6.7%
H.E.L.L.P.	3	10%
Eclampsia	2	6.7%
Hemorrhagicshock	8	26.7%
Septicshock	8	26.7%
Hypovolemicshock	1	3.3%
DKA	1	3.3%
Total	30	

Distribution of cases according to types of renal failure :

Type	Number of patients	Mortality
Pre-renal	17(56.7%)	9(52.9%)
Renal	13(43.3%)	8(61.5%)
postrenal	0	0
TOTAL	30	

Distribution of cases according to the mode of delivery:

Mode of delivery	Number of patients (n= 30)	Percentage
Induced labour (term)	3	10%
Induced labour(preterm)	4	13.3%
Spontaneous labour(term)	2	6.7%
Spontaneous labour (preterm)	3	10%
Assisted	1	3.3%
L.S.C.S.	14	46.7%
laparotomy	2	6.7%
undelivered	1	3.3%

Distribution of cases according to blood transfusion :

Blood transfusion	No of patients (n=30)	Percentage
Yes	27	90%
No	3	10%

Distribution of cases according to the maternal outcome :

Maternal outcome	Number of patients (n=30)	Percentage
Complete renal recovery	13	43.3%
Death	17	56.7%
Total	30	100 %

Perinatal outcome	Number of babies (n=29)	Percentage
Term (live)	12	41.4%
Preterm (live)	3	10.3%
Abortion	0	0%
IUD (term)	8	27.6%
I.U.D. (preterm)	5	17.2%
Stillbirth	1	3.4%

Distribution of cases according to perinatal outcome :

Antenatal visits	No of cases	Percentage
Booked	8	26.7%
Unbooked	22	73.3%
Total	30	100 %

Distribution of cases according to their antenatal visits:

CONCLUSION

- Incidence of obstetric renal failure in our hospital was 1.6%.
- The incidence in developed countries is low due to improved obstetrics care.
- Pre-eclampsia / eclampsia is the most common cause of obstetric renal failure in developed countries followed by hemorrhagic shock and sepsis.
- Maternal and peri natal mortality remained high in AKI patients.
- Pre term and low birth weight are the complications in AKI cases.
- Early recognition and management of hypertensive disorders could reduce the incidence of AKI.
- Recognition and treatment of intravascular volume depletion to prevent renal ischemia are important.
- Assuring good antenatal and perinatal care, proper management of obstetric complications and appropriate time referral of cases to tertiary center are the crucial tools in preventing morbidity and mortality in obstetrics renal failure.

REFERENCES

- [1]. Prakash J, Ganiger V C. Acute kidney injury in pregnancy-specific disorders. *Indian J Nephrol* 2017;27:258-70
- [2]. Prakash J. The kidney in pregnancy: A journey of three decades. *Indian J Nephrol* 2012;22:159-67.
- [3]. Jim, Belinda, and Vesna D Garovic. "Acute Kidney Injury in Pregnancy." *Seminars in nephrology* vol. 37,4 (2017): 378-385. doi:10.1016/j.semnephrol.2017.05.010
- [4]. Mehrabadi A, Liu S, Bartholomew S, Hutcheon J, Kramer M, Liston R, et al. Temporal trends in postpartum hemorrhage in Canada from 2003 to 2009. *J ObstetGynaecol Can*2014;36:21-33
- [5]. Makris, Konstantinos, and LoukiaSpanou. "Acute Kidney Injury: Definition, Pathophysiology, and Clinical Phenotypes." *The Clinical biochemist. Reviews* vol. 37,2 (2016): 85-98.
- [6]. Chawla, L., Bellomo, R., Bihorac, A. et al. Acute kidney disease and renal recovery: consensus report of the Acute Disease Quality Initiative (A.D.Q.I.) 16 Workgroup. *Nat Rev Nephrol* **13**, 241–257 (2017). <https://doi.org/10.1038/nrneph.2017.2>
- [7]. Studd J: The origin and effects of proteinuria in pregnancy. *J ObstetGynecol Br Commonwealth* 80:872-883,1973
- [8]. Dieckman WJ: Acute nephritis and pregnancy. *Am J Obstet Gynecol*32:227-240,1936
- [9]. Lindheimer MD, Katz AI: The Kidney in pregnancy. *N Engl J Med*283: 1095-1097,1970
- [10]. Packham D.K., North R.A., Fairly K.F., et al: Primary glomerulonephritis and pregnancy. *Q.J. Med* 266:537-553,1989
- [11]. Bailey, R.R.; Rolleston, G.L. Kidney length and ureteric dilatation in the puerperium. *B.J.O.G. Int. J. Obs.Gynaecol.* **1971**, 78, 55–61. [CrossRef]
- [12]. Cheung, K.L.; Lafayette, R.A. Renal physiology of pregnancy. *Adv. Chronic Kidney Dis.* **2013**, 20, 209–214.[CrossRef]
- [13]. Beydoun, S.N. Morphologic Changes in the Renal Tract in Pregnancy. *Clin. Obs. Gynecol.* **1985**, 28, 249–256.[CrossRef]
- [14]. Odutayo, A.; Hladunewich, M. Obstetric Nephrology: Renal Hemodynamic and Metabolic Physiology in Normal Pregnancy. *Clin. J. Am. Soc. Nephrol.* **2012**, 7, 2073–2080. [CrossRef]

- [15]. Davison, J.M.; Dunlop, W. Renal hemodynamics and tubular function in normal human pregnancy. *KidneyInt.* **1980**, *18*, 152–161. [CrossRef]
- [16]. Carlin, A.; Alfirevic, Z. Physiological changes of pregnancy and monitoring. *Best Pr. Res. Clin. Obs. Gynaecol.* **2008**, *22*, 801–823. [CrossRef]
- [17]. Davison, J.M.; Hytten, F.E. The effect of pregnancy on the renal handling of glucose. *B.J.O.G. Int. J. Obs.Gynaecol.* **1975**, *82*, 374–381. [CrossRef]
- [18]. Cornelis, T.; Odutayo, A.; Keunen, J.; Hladunewich, M. The Kidney in Normal Pregnancy and Preeclampsia. *Semin. Nephrol.* **2011**, *31*, 4–14. [CrossRef]
- [19]. Piccoli, G.B.; Zakharova, E.; Attini, R.; Ibarra Hernandez, M.; Covella, B.; Alrukhaimi, M.; Liu, Z.-H.; Ashuntantang, G.; Orozco Guillen, A.; Cabiddu, G.; et al. Acute Kidney Injury in Pregnancy: The Need for Higher Awareness. A Pragmatic Review Focused on What Could Be Improved in the Prevention and Care of Pregnancy-Related A.K.I., in the Year Dedicated to Women and Kidney Diseases. *J. Clin. Med.* **2018**, *7*, 318. [CrossRef]
- [20]. Acharya, A.; Santos, J.; Linde, B.; Anis, K. Acute Kidney Injury in Pregnancy—Current Status. *Adv. Chronic Kidney Dis.* **2013**, *20*, 215–222. [CrossRef]
- [21]. Machado, S.; Figueiredo, N.; Borges, A.; Sao Jose Pais, M.; Freitas, L.; Moura, P.; Campos, M. Acute kidney injury in pregnancy: A clinical challenge. *J. Nephrol.* **2012**, *25*, 19–30. [CrossRef]
- [22]. Nwoko, R.; Plešcaš, D.; Garovic, V.D. Acute kidney injury in the pregnant patient. *Clin. Nephrol.* **2012**, *78*, 478–486. [CrossRef]
- [23]. Rao, S.; Jim, B. Acute Kidney Injury in Pregnancy: The Changing Landscape for the 21st Century. *Kidney Int.Rep.* **2018**, *3*, 247–257. [CrossRef]
- [24]. Lokki AI, Haapio M, Heikkinen-Eloranta J. Eculizumab Treatment for Postpartum H.E.L.L.P. Syndrome and aHUS-Case Report. *Front Immunol.* 2020 Apr 3;11:548. doi: 10.3389/fimmu.2020.00548. PMID: 32308654; PMCID: PMC7145984.
- [25]. George JN, Nester CM. Syndromes of thrombotic microangiopathy. *N Engl J Med.* 2014 Aug 14;371(7):654-66. doi: 10.1056/NEJMr1312353. P.M.I.D.: 25119611.
- [26]. Allen A, Kim W, Larson J, Rosedahl J, Yawn B, McKeon K, et al. The epidemiology of liver diseases unique to pregnancy in a U.S. community: a population-based study. *Clin Gastroenterol Hepatol.* (2016) 14:287–94. doi: 10.1016/j.cgh.2015.08.022
- [27]. Knight M, Nelson-Piercy C, Kurinczuk J, Spark P, Brocklehurst P, System U.O.S. A prospective national study of acute fatty liver of pregnancy in the U.K. *Gut.* (2008) 57:951–6. doi: 10.1136/gut.2008.148676
- [28]. Dekker R, Schutte J, Stekelenburg J, Zwart J, van Roosmalen J. Maternal mortality and severe maternal morbidity from acute fatty liver of pregnancy in the Netherlands. *Eur J Obstet and Gynecol Reprod Biol.* (2011) 157:27–31. doi: 10.1016/j.ejogrb.2011.02.015
- [29]. Basile DP, Anderson MD, Sutton TA. Pathophysiology of acute kidney injury. *Compr Physiol.* 2012;2(2):1303-1353. doi:10.1002/cphy.c110041
- [30]. Imbasciati E, Pardi G, Capetta P, et al: Pregnancy in women with chronic renal failure. *Am J Nephrol* 6:193-198, 1986
- [31]. Hou SH, Grossman SD, Madias NE: Pregnancy in women with renal disease and moderate renal insufficiency. *Am J Med* 78:185-194, 1985
- [32]. Jungers P, Chauveau D, Choukroun G, et al: Pregnancy in women with impaired renal function. *Clin Nephrol* 47:281-288, 1997
- [33]. Jones DC, Hayslett JP: Outcome of pregnancy in women with moderate or severe renal insufficiency. *N Eng J Med* 335:226-232, 1996
- [34]. Cunningham FG, Cox SM, Handstand T.W., et al: Pregnancy in women with chronic renal failure. *Am J Obstet Gynecol* 163:453-459, 1990
- [35]. Leavey SF, Weitzel WF: Endocrine abnormalities in chronic renal failure. *Endocrinol Metab Clin North Am* 31:107-119, 2002
- [36]. Fink JC, Schwartz SM, Benedetti TJ, et al: Increased risk of adverse maternal and infant outcomes among women with renal disease. *Paediatr Perinat Epidemiol* 12: 277-287, 1988
- [37]. Fischer MJ, Lehnerz SD, Hebert JR, et al: Kidney disease is an independent risk factor for adverse fetal and maternal outcomes in pregnancy. *Am J Kidney Dis* 43:415-423, 2004
- [38]. Vinturache, Angela et al. "The Changing Landscape of Acute Kidney Injury in Pregnancy from an Obstetrics Perspective." *Journal of clinical medicine* vol. 8,9 1396. 6 Sep. 2019, doi:10.3390/jcm8091396
- [39]. Hou S: Pregnancy in women with chronic renal disease. *N Engl J Med* 312:836, 1985
- [40]. Bar J, Orvieto R, Shalev Y, et al: Pregnancy outcome in women with primary renal disease. *Isr Med Assoc J* 2: 178-181, 2000
- [41]. Williams, David, and John Davison. "Chronic kidney disease in pregnancy." *B.M.J. (Clinical research ed.)* vol. 336,7637 (2008): 211-5. doi:10.1136/bmj.39406.652986.BE
- [42]. Prakash J, Ganiger VC, Prakash S, Iqbal M, Kar DP, Singh U, Verma A. Acute kidney injury in pregnancy with special reference to pregnancy-specific disorders: a hospital based study (2014-2016). *J Nephrol.* 2018 Feb;31(1):79-85. doi:10.1007/s40620-017-0466-y. Epub 2018 Jan 4. P.M.I.D.: 29302904
- [43]. Ramachandran R, Nayak S, Anakutti HP, et al. Postpartum Renal Cortical Necrosis Is Associated With Atypical Hemolytic Uremic Syndrome in Developing Countries. *Kidney Int Rep.* 2018;4(3):420-424. Published 2018 Nov 28. doi:10.1016/j.ekir.2018.11.012
- [44]. Mishra Vineet V, Goyal Preeti A, Aggarwal Rohina S, et al. A Single-Centre Experience of Obstetric Acute Kidney Injury. *J Obstet Gynaecol India.* 2016;66(Suppl 1):207-211. doi:10.1007/s13224-016-0839-5
- [45]. Eswarappa M, Gireesh MS, Ravi V, Kumar D, Dev G. Spectrum of acute kidney injury in critically ill patients: A single center study from South India. *Indian J Nephrol.* 2014;24(5):280-285. doi:10.4103/0971-4065.132991