



## ORIGINAL RESEARCH PAPER

### STUDY OF ETIOLOGICAL FACTORS OF ACUTE KIDNEY INJURY IN NEONATES ADMITTED IN NICU, DEPARTMENT OF PEDIATRICS, GOVERNMENT MEDICAL COLLEGE, SRIKAKULAM, ANDHRA PRADESH

Paediatrics

**KEY WORDS:** AKI, Perinatal asphyxia, Sepsis, Dehydration

<b>Dr P Sandeep</b>	Assistant Professor, Department of Pediatrics, Government Medical College, Srikakulam.
<b>Dr K Madhavi</b>	Assistant Professor, Department of Pediatrics, Government Medical College, Srikakulam.
<b>Dr K Koteswararao</b>	Professor And Head of Department, Department of Pediatrics, Government Medical College, Srikakulam.
<b>Dr Porika Ramesh</b>	Second Year Postgraduate, Department of Pediatrics, Government Medical College, Srikakulam.
<b>Dr V.R.V. K. Kishore*</b>	Associate Professor, Gayatri Vidya Parishad Institute of Healthcare And Medical Technology Visakhapatnam. *Corresponding Author

#### ABSTRACT

**BACKGROUND:** Acute kidney injury (AKI) is an important clinical problem in sick neonate. In most patients, AKI accompanies with a predisposing factor such as sepsis, asphyxia and dehydration.

**OBJECTIVE:** The aims of this study were to determine the incidence, associated contributing factors of AKI in hospitalized newborn infants..

**STUDY DESIGN:** An prospective study in neonates admitted in NICU, Department of Pediatrics during 6 months period from march 2021 to august 2021, GMC Srikakulam.

This study included 600 sick neonates admitted during the study period. AKI was defined when serum creatinine level >1.5 mg/dl and BUN was >20 mg/dl on two separate occasions at 24 hours apart

**RESULT:** 50 out of 600 sick neonates had AKI, of whom 64% were male and 36% female. The term and preterm neonates were 56% and 44% respectively. Etiological factors in neonates are Perinatal asphyxia(56%), Neonatal sepsis(22%), Dehydration(16%) and Congenital heart diseases(6%).

**CONCLUSION:** This study showed that in a tertiary care hospital AKI is not uncommon (8.3%) in neonatal care unit. It is associated with some preventable conditions such as sepsis, perinatal asphyxia and shock.

#### INTRODUCTION:

Acute kidney injury(AKI) is characterized by a sudden deterioration in kidney function that results in the accumulation of nitrogenous waste products (e.g. urea) and alters the regulation of extracellular fluid volume, electrolytes and acid-base homeostasis. Although the criteria for AKI have varied, a frequently used definition is a serum creatinine level of more than 1.5mg/dl<sup>(1)</sup>.

The causes of neonatal AKI are multiple and can be divided into prerenal, renal and postrenal categories. Prerenal azotemia is a most common type of AKI in the neonates and may account for up to 85% of all cases. Classification definitions of AKI are based on serum creatinine and urine output. The two most common classification systems for severity of AKI are the Risk, Injury, Failure, Loss, End-stage renal disease(RIFLE)<sup>(2)</sup> and the Acute Kidney Injury Network(AKIN)<sup>(3)</sup>. Risk factors for the development of neonatal AKI include very low birth weight(less than 1500 grams), low 5 minute APGAR score, maternal drug administration, intubation at birth, RDS, PDA, phototherapy, dehydration, neonatal sepsis<sup>(4)</sup>. There are currently no specific therapies to treat AKI. The basic approach and management of AKI should be planned according to underlying etiology. The prognosis for AKI is variable with mortality rates ranging from 14% to 73%.

But it seems to be essential for early detection of AKI for planning appropriate fluid and electrolyte therapy and thereby for improved outcome. This study was conducted to see the incidence, predisposing factors of acute kidney injury in sick neonate and their outcome.

#### METHODS:

**Study design:** An prospective study in neonates admitted in NICU, Department of Pediatrics during 6 months period from march 2021 to august 2021, GMC Srikakulam.

**Sample size:** n=50

#### AIMS & OBJECTIVES:

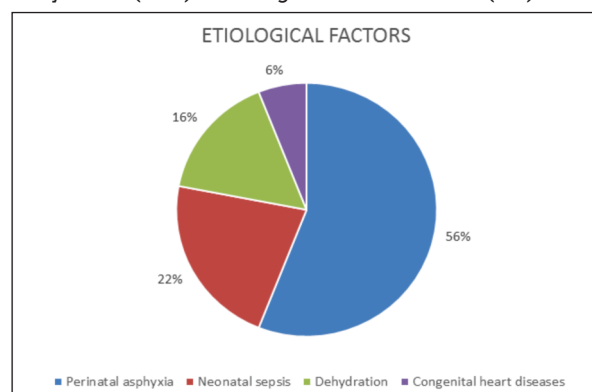
To study etiological factors of AKI in neonates

#### Sample Collection:

Samples for estimation of serum electrolytes, serum creatinine and blood urea are collected and sent to lab.

#### RESULTS:

From march 2021 to august 2021, a total number of 600 cases admitted in NICU, GMC, Srikakulam. Of whom, 50 cases diagnosed with AKI as per criteria. In those 50 newborns, inborn were 20(40%) and outborn were 30(60%), term infants were 28(56%) and preterm infants were 22(44%), male infants were 32(64%) and female infants were 18(36%). Incidence of AKI is 8.3% in NICU admissions. Etiological factors in neonates are Perinatal asphyxia(56%), Neonatal sepsis(22%), Dehydration(16%) and Congenital heart diseases(6%).



## DISCUSSION:

In this study, it was found that good number of sick neonates developed AKI. Stapleton et al,<sup>5</sup> Ghaebagh MM et al.<sup>6</sup>, Airede A et al.<sup>7</sup> and Andreoli SP<sup>8</sup> found that the incidence of AKI was 3-8% in sick neonates. In several studies<sup>5,6,7,8</sup> it was found that predominantly male and term babies developed renal impairment. In our study, similar findings were found.

Perinatal asphyxia was high in this study. It was 53% in a study done by Airede A et al<sup>7</sup> babies with perinatal asphyxia developed AKI. Long-term outcome of neonates was not the part of this study; thus, incidence of chronic kidney disease (CKD) was not assessed.

## CONCLUSION:

The study provides an overview of AKI occurring in the early clinical course of neonates admitted to NICU. During the first week after birth, AKI was seen in 8.5% of infants admitted in NICU. Neonates with acquired AKI were generally severely ill and AKI is associated with high morbidity and mortality of both preterm and term infants. Episodes of AKI were generally transient and self-limiting and were mainly diagnosed by 1.5mg/dl criteria. Renal functions at discharge had improved in most cases of acquired AKI.

## REFERENCES :

1. Askenazi DJ, Ambalavanan N, Goldstein SL. Acute kidney injury in critically ill newborns: what do we know? What do we need to learn? *Pediatr Nephrol* 2009;24:265-74.
2. Bellomo R, Ronco C, Kellum JA, Mehta RL, Palevsky P. Acute Dialysis Quality Initiative workgroup. Acute renal failure - definition, outcome measures, animal models, fluid therapy and information technology needs: the Second International Consensus Conference of the Acute Dialysis Quality Initiative (ADQI) Group. *Crit Care* 2004;8:204-12.
3. Mehta RL, Kellum JA, Shah SV, Molitoris BA, Ronco C, Warnock DG, et al. Acute Kidney Injury Network (AKIN): report of an initiative to improve outcomes in acute kidney injury. *Crit Care* 2007;11:31.
4. Cataldi L, Leone R, Moretti U, De Mitri B, Fanos V, Ruggeri L, et al. Potential risk factors for the development of acute renal failure in preterm newborn infants: a case-control study. *Arch Dis Child Fetal Neonatal Ed* 2005;90:514-9.
5. Stapleton FB, Jones DP, Green RS. Acute renal failure in neonates: incidence, etiology, outcome. *Pediatric Nephrology* 1987;1(3):314-320.
6. Gharehbaghi MM, Peirovifar A. Evaluating causes of acute renal failure in newborn infants. *Pak J Med Sci* 2007;23(6):877-880.
7. Airede A, Bello M, Weerasinghe H D. Acute renal failure in the newborn: Incidence and outcome. *J Paediatr Child Health* 1997;33:246-249.
8. Andreoli SP. Acute renal failure in the newborn. *Semin perinatol* 2004;28:112-123.