



## ACUTE KIDNEY INJURY IN NEONATES -INCIDENCE AND CLINICAL PROFILE: A RETROSPECTIVE STUDY.

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### ARTICLE INFO

### ABSTRACT

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AKI, high risk neonates, nicu, kidney injury.

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### INTRODUCTION

High risk neonates admitted in neonatal intensive care unit have acute kidney injury. Single-center studies suggest that neonatal AKI affects 18%-70% of critically ill neonates and is associated with poor outcomes (1-7). Studies have reported the epidemiology and risk factors associated with AKI over the entire neonatal period. It may be important to know the risk factors of neonatal AKI. Neonates admitted to the neonatal intensive care unit (ICU) have extended hospital courses with a variety of exposures spanning various stages of kidney development which influence their risk for AKI. The first week after birth is a vulnerable time for the development of neonatal AKI due to antenatal, intrapartum, and early postnatal transition factors. Specifically, during the transition into the extrauterine environment, the normal neonatal kidney physiology (with an inherently low GFR) predisposes this immature kidney to AKI. Because the neonate's serum creatinine will reflect maternal values at birth which then evolve over the next few postnatal days to find a new "steady state," the definition of neonatal AKI in the first week may differ from other time points. Additionally, a comprehensive evaluation of the risk factors for AKI during the first week after birth would help clinicians to identify vulnerable neonates and researchers to select at-risk infants for enrollment into future prospective interventional studies designed to reduce the prevalence of AKI shortly after birth.

In 2014, the Neonatal Kidney Collaborative was established and performed the multicenter study Assessment of Worldwide Acute Kidney Injury Epidemiology in Neonates (AWAKEN) (8). AWAKEN was the first multicenter study

designed to evaluate neonatal AKI among critically ill neonates. We have recently published data from the AWAKEN study which includes the incidence and outcomes of neonates who experience AKI during their entire neonatal hospitalization (9). Using the AWAKEN database, we hypothesize that the risk for AKI and the factors influencing that risk change according to gestational age and postnatal age. In order to improve the understanding of neonatal AKI during the first week after birth, we performed an analysis to (1) determine whether early AKI was associated with poor short-term outcomes and (2) determine the perinatal risk factors associated with early AKI across the gestational age.

Incidence of acute kidney injury [AKI] in neonates, in Indian scenario is less studied. Incidence of AKI in neonates admitted with risk factors were studied retrospectively and evaluated in our institute, which is a tertiary level neonatal care unit in south India. Neonates with AKI going for peritoneal dialysis were studied during the period June -2010 to January 2011.

Objectives: to find out the incidence of AKI in high risk neonates admitted in neonatal icu

**Type of study:** A retrospective study.

**Setting:** a multi- specialty tertiary care center.

### SUBJECTS AND METHODS

All neonates who were admitted in NICU with risk factors defined by pre-term less than 32 weeks, low birth weight less than 2 kg, shock requiring inotropes, culture proven sepsis, respiratory distress requiring mechanical ventilation, perinatal asphyxia, dyselectrolytemia, were included. Incidence of AKI in neonates admitted with

risk factors were studied retrospectively and evaluated in a tertiary level neonatal care unit. Neonates with AKI going for peritoneal dialysis were studied during the period June -2010 to January 2011. All high risk neonates admitted in neonatal icu, of tertiary level neonatal referral unit were included in the study. All neonates outborn, pre term more than 32 week, birth weight more than 2kg, not in shock, no sepsis, no respiratory distress, normoelectrolytemia, were excluded in the study.

AKI defined by S.BUN >30 and Creatinine >1.5. Daily details were collected regarding fluid prescription, electrolytes, vital signs, and medications from days 1-7. The rationale for collecting the exposure variables was on the basis of previous retrospective studies (8, 10-15). Admission diagnoses were extracted from the patient's chart. Case report forms and manual of operations are provided in the supplemental materials of a study by Jetton et al. (8).

**Statistical analysis** Data was analyzed using computer software, Statistical Package for Social Sciences (SPSS) version 11. Descriptive statistics mean and percentages were used to summarize the findings.

**Outcome measures** We evaluated the incidence of AKI retrospectively over the mentioned period S.BUN, Creatinine, electrolytes were evaluated. S BUN >30 and creatinine >1.5 were defined as AKI. Neonates admitted in NICU with risk factors like pre-maturity sepsis, shock, perinatal -asphyxia, ventilation, peritoneal dialysis were included in the study and correlated.

## RESULTS

Of total 103 admissions with risk factors, majority were pre-terms 75% [77], terms 25% [26] among them males were 52 and females 41. AKI in neonates were 7% [7] About 51% [53] required mechanical ventilation and 33% [34] had shock requiring inotropic support. 18% [19] neonates had culture proven sepsis. 7% [7] had perinatal asphyxia. 1% [1] required peritoneal dialysis. 3% had urine output less than [1ml/kg/hr] none had output less than 0.5 ml/kg/hr.

## DISCUSSION

Acute kidney injury in tertiary care neonatal icu has been retrospectively evaluated. High risk neonates who seek nicu admission having risk factors who had AKI as per the definition were studied. The prognosis, those infants requiring peritoneal dialysis and its outcome were noticed in the study. Most of the infants were pre terms than term infants. Babies requiring peritoneal dialysis were less as noticed 1%.

## CONCLUSION

AKI in neonates was evaluated retrospectively. AKI in neonates is multi-factorial. Those neonates requiring peritoneal dialysis are only one percent. Respiratory dysfunction had a direct co-relation with AKI.

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