

# NCPCC 2014 Abstracts (Oral)

Received:4-Nov-2014/Accepted:11-Nov-2014 /Published online:15-Nov-2014

## High-frequency Oscillatory Ventilation (HFOV) for Acute Pediatric Respiratory Failure - A tertiary care centre experience of 62 cases

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**Background & Aims:** The present article reports our experience with high-frequency oscillatory ventilation (HFOV) in pediatric patients with acute respiratory failure who deteriorated on conventional mechanical ventilation.

**Methods:** In this analysis of retrospective data, we analyzed the chart records of 62 consecutively ventilated pediatric patients with HFOV from October 2011 to August 2014 in our pediatric intensive care unit. The demographics, cause of respiratory failure, Pediatric Index of Mortality (PIM II) Score, oxygenation index, PaCO<sub>2</sub>, and complications if any, were recorded and calculated at various time points before and after the start of HFOV, along with patient outcome and cause of death.

**Results:** There were 39 male subjects while 23 were female. The median age of the subjects was 54 (1.5-192) months. All patients received conventional ventilation before HFOV. Mean oxygenation index (OI) at the start of HFOV was 28 and mean PCO<sub>2</sub> was 67 mmHg with significant respiratory acidosis in all. After initiation of HFOV, there was an immediate and sustained improvement in ventilation with significant decrease in PCO<sub>2</sub> ( $p \leq 0.003$ ) and improved oxygenation with increase in PaO<sub>2</sub>/FiO<sub>2</sub> ratio in most subjects except 4. Oxygenation Index (OI) was decreased significantly after 6 hours of HFOV and maintained for at least 48 hours ( $p < 0.05$ ) except in patients who developed complications (pneumothorax – 5, hemodynamic compromise – 3 & oxygenation failure – 4). Overall survival rate was 33%. Mean PIM II risk of mortality was 63% with no mortality benefit with use of HFO in our series of patients.

**Conclusions:** HFOV rescue therapy was associated with a significant improvement in ventilatory & oxygenation parameters without any benefit on mortality. Future studies are necessary to evaluate whether the outcome of patients may be improved if HFOV is applied earlier in the course of disease.

## Occurrence and Outcome of Acute Kidney Injury Amongst Patients Admitted in Paediatric Intensive Care Unit (PICU)

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**Objective:** To study the occurrence and progression of acute kidney injury (AKI) IN Children in paediatric intensive care unit (PICU). as defined by pRIFLE criteria and to study its association with mortality and length of stay in PICU.

**Design:** Prospective cohort study.

**Setting:** PICU, Maulana Azad Medical College

**Patients:** The study included 250 patients, aged 1 month to 12 years, admitted to PICU, from May 2012 to Jan 2013.

**Intervention:** For all Patients pRIFLE stage was checked at admission, every 2nd day if normal and daily if any abnormality was found.

**Main outcome measures:** Patients were subsequently divided into AKI and no AKI groups, progression/improvement of various AKI stages was recorded and effect of AKI on mortality and Length of stay in PICU was analyzed.

**Result:** 34.4% of total patients developed AKI. 24.8% had an initial p-rifle Score of risk (R), 7.2% had injury (I) and 2.4% had failure (F). Out of children who had initial score of R, 14.5% progressed to I while 89% were detected with AKI within 7 days of PICU stay. Mortality in max pRIFLE score of R, I, F was 45.8%, 62.3%, 62.5% respectively, compared with 18.9% for patients without AKI. Children with AKI had a higher mean (1.64 times) length of stay in PICU than children with no AKI.

**Conclusion:** In our PICU population acute kidney, injury, as defined by the pRIFLE classification, is associated with increased mortality and length of stay.

## Predictors of Extubation Success in Mechanically Ventilated Children in PICU

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**Aim:** To evaluate the significance of parameters affecting extubation in children.

**Methods:** Data was collected prospectively on all children between age group of one month to 17 year, admitted to pediatric ICU over a period of one year. Patients admitted with respiratory failure at admission or during hospitalization were included. Pre-extubation clinical, ventilator and laboratory parameters were evaluated. Their significance in relation to extubation success was determined by student's t test and chi-square test.

**Results:** A total of 53 patients underwent 62 extubation trials (n = extubation trials). Patients who were successfully extubated had significantly better nutritional status (weight > 3<sup>rd</sup> centile) and lower PRISM score (< 10). Most common etiology amongst patients who were being mechanically ventilated was primary pulmonary pathology. Extubation success was significantly higher in this group (p value-0.0039). Laboratory parameters (pre-extubation ABG, hematocrit, serum K<sup>+</sup>) were not found to be significantly associated with extubation success. Pre-extubation ventilator parameters-PEEP ( $\leq 3$ ), DPIP (8-11), ventilator rates ( $\leq 25$ ) and FiO<sub>2</sub> ( $\leq 0.35$ ) were found to be associated with significantly higher extubation success. Stridor, accidental extubation, VAP (ventilator associated pneumonia) and duration of mechanical ventilation (> 7 days) had statistically

higher association with extubation failure.

**Conclusions:** This study demonstrates that close attention towards etiology, clinical assessment, PRISM Score, respiratory mechanics, duration of mechanical ventilation and ventilator related complications, may help predict extubation success. Thus improving patient care and final outcome.

## **Impact of Multifaceted Quality Improvement Intervention on Device Related Infections in Pediatric Intensive Care Unit-A single centre experience**

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**Background and Aims:** Health care associated infections (HAI) are a significant problem in PICU. Surveillance and prevention of HAI by multifaceted quality improvement intervention remains a part of standard of care.

**Methods:** Study was conducted in 19 bedded-PICU of a tertiary care referral academic institute. Data regarding VAP and CLABSI using CDC definition was collected prospectively before (July-Dec2013) and after (Jan-June-2014) introduction of multifaceted quality improvement intervention consists of infection control nurse & physician and hand hygiene education module and wearing a gown & mask during the care of critically ill children. Institute scientific advisory committee approved the study.

**Results:** Before intervention, incidence of VAP was 28.5 and CLABSI was 13.7 as compared to after intervention period, incidence of VAP was 13.3 per 1000 ventilation days and CLABSI was 8.3 per 1000 catheter days. Patients ventilated for > 48 hours who had VAP was significantly less after intervention as compared to before intervention [14.2% vs 25.2%;  $p = 0.012$ , OR, 95% CI 0.49, 0.28 – 0.86]. Both the groups were similar with respect to age, sex ratio, severity (PRISM-III), device utilization rate and grade of infection. No significant difference in overall PICU mortality before and after intervention (28.2% vs 28.9%).

**Conclusion:** Multifaceted quality improvement intervention results in significant reduction of health care associated infections rate though it was higher than reported from developed countries.

## **Factors Affecting Survival After in-Hospital Cardiac Arrest Among Pediatric Patients in a Tertiary Care Hospital in South India**

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**Background and Aims:** Often a pediatric intensivist is questioned about chances of survival of a child after an episode of in-hospital cardiac arrest by the anxious parents. Although western data is available, they may not be generalizable for Indian setting. Due to lack of studies in Indian children, there is a need to determine the factors affecting survival in children after an episode of in-hospital cardiac arrest.

**Methods:** All children aged  $\leq 12$  years with an episode of in-hospital cardiac arrest, atleast 6 hours after admission to the hospital, in pediatric general ward, emergency room and pediatric ICU were recruited. Preterm children, children with terminal illness receiving compassionate palliative care and children who were brain dead at admission were excluded. Various hemodynamic parameters, blood sugar and ECG rhythm and certain investigations for organ function and venous blood gas analysis (done at admission and 1 hour before arrest) were recorded. Cardiac arrest event characteristics were recorded according to the Utstein guidelines. Post resuscitation hemodynamic parameters and random blood glucose were recorded for children with ROSC at specified time intervals (4, 12 and 24 hours). Neurological outcome based on Pediatric Cerebral Performance Category (PCPC) scale was determined for all survivors at discharge. All these parameters were compared between the survivors (discharged after an in-hospital cardiac arrest) and non survivors.

**Results:** Among 5049 children admitted during study period, 382 (7.5%) children had an episode of in-hospital cardiac arrest. Of these, 225 children had to be excluded. 137 children were included for study and results of these were analysed. ROSC was achieved in 82 children (59.8%) but only 27 children (19.7%) survived till hospital discharge (survivors). Most common rhythm during arrest was bradycardia (72.9%) followed by asystole (19%) and VT/VF (5.8%). Presence of low blood pressure, prolonged capillary refilling time, low saturation and hypothermia at 4 hours, 12 hours and 24 hours post cardiac arrest were associated with poor outcome. Multivariate logistic regression analysis showed prolonged CFT, combined (metabolic& respiratory) acidosis and altered coagulation profile during pre-arrest period, need for multiple doses (> 3) of adrenaline during intra-arrest period and low GCS at 24 hrs post ROSC were also predictive of non survival apart from the above mentioned factors. 77.8% had good neurological outcome (with PCPC score of 1 or 2 at hospital discharge).

**Conclusion:** Survival after cardiac arrest can be reliably predicted using certain pre-arrest parameters and blood investigations and post cardiac arrest hemodynamic parameter monitoring.

## **Assessment of Volume Responsiveness by Passive Leg Raising Test in Pediatric Patients with Shock - Preliminary observations**

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**Background and Aims:** Passive leg raising (PLR) test to assess fluid responsiveness (FR) has been validated extensively in adults

and has been found to be very useful in assessment of the same. However, paediatric literature is limited. The objective of this study was to determine if PLR induced changes in hemodynamics predicted FR in children with shock.

**Methods:** This is an ongoing prospective observational study in a tertiary care paediatric centre, done after ethics committee approval. Children with tachycardia plus any other sign of shock were included. Hemodynamic parameters including heart rate, systolic BP, stroke volume and cardiac index (CI) were assessed at baseline, after PLR and after volume loading using Ultrasonic Cardiac Output Monitor (USCOM). An increase in CI > 10% with PLR was considered as predictor of fluid response.

**Results:** Of 17 patients, only 3 patients (17.6%) had >10% increase in CI after PLR and 5 (29.4%) had an increase after fluid challenge. The sensitivity and specificity of PLR in predicting fluid responsiveness were 40% and 91.7% respectively. The positive predictive value of PLR was 66.7% and the negative predictive value 78.6%.

**Conclusions:** The preliminary results of this ongoing study indicate that PLR may not be as good a predictor of FR as in adults. However, the negative predictive value may be significant. Certainly, the sample size was small and larger numbers are required to validate these findings.

## Retrospective Analysis of Levosimendan in Pediatric Post Cardiac Surgery Patients

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**Background and Aim:** Levosimendan is a new inodilator with calcium sensitizing and K-ATP channel opening properties. Our aim was to demonstrate its safety and efficacy in post cardiac surgery patients.

**Methods:** Ethical clearance was obtained. Retrospective analysis of 20 children who received levosimendan infusions between March 2014 and August 2014. Cases included were TGA, TAPVC, AVCD, TOF, Ebsteins anomaly etc. Levosimendan was administered without bolus dose, as a continuous infusion of 0.1 to 0.2 µg/kg/min over 24 to 48 hours duration. Mean time of initiation was 6.5 days (1-17 days). Hemodynamic parameters, inotropic score and ECHO findings were analysed from 48 hours before and upto 5 days after levosimendan infusion. Adverse effects during levosimendan infusion were studied

**Results:** Mean inotropic score (IS) for patients improved from 14.72 to 9.63 {Median value before infusion 14 (range 1.25-42.3) and after infusion 8.6 (range 1.6-51)} 14 out of 20 (70%) patients had improvement in the IS within 72 hours. ECHO showed marginal improvement for 6 patients (30%) in terms of biventricular function. HR, systolic BP, diastolic BP, mean BP, and CVP were largely unchanged. No adverse effects were noticed.

**Conclusions:** This study shows levosimendan is safe in postoperative period and its use resulted in a significant reduction

in inotrope score. Further prospective studies in children are required to determine its efficacy early in post cardiac surgery children with LCOS.

## Long Term Effects of Mechanical Ventilation on Pulmonary Functions in Children

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**Aim:** To determine effect and factors affecting pulmonary function tests in mechanically ventilated children on follow up.

**Method:** Mechanically ventilated children (> 5 yrs) admitted in PICU of a tertiary care, multispecialty hospital over a period of 15 months were included. PFT were done using spirometer at time of discharge, 3 months and 6 months later. Values were compared to expected norms at each visit and deficit improvement noted.

**Results:** 20 patients completed 6 month follow up (male: female 3:1) with mean age of 9 years. Reason for ventilation was pulmonary condition (45%), CNS (35%) and miscellaneous (20%), mean duration of ventilation 8.3 days. 75% (n = 15) and 65% (n = 13) patients at 3 months, 6 months respectively had restrictive pattern of lung function. No patient had significant deficit in Tidal volume. Significant improvement was seen in inspiratory volume, PEFR at 3 and 6 months though normal values were not achieved. Nearly 65% and 60% children had deficit in FVC at 3 and 6 months respectively. Significant increase in FEV1 occurred on follow up. Patients with neurological causes, low PRISM III scores had better results, while longer duration of ventilation, high peak pressures and high FiO2 had worse outcome. Vital Capacity, FEV1 and FVC showed greatest deficits.

**Conclusion:** Mechanically ventilated patients develop significant defects in long term lung function, most common was restrictive lung disease. Many factors may affect the same. Longer follow up studies are needed.

## Comparison of 0.45% vs. 0.22% Normal Saline in 5% Dextrose as Intravenous Maintenance Therapy in Children Admitted in Pediatric ICU

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**Background and Aims –** Due to concerns regarding occurrence of hyponatremia with use of hypotonic maintenance solutions (0.22% normal saline (NS) in 5% dextrose) in critically ill children, we did a study to compare the change in serum sodium levels in children receiving i.v maintenance fluids as 0.22% NS in 5% dextrose or 0.45% NS in 5% dextrose.

**Methods-** An open labeled RCT was conducted in 140 children aged 3 months-12 years in PICU. One group received 0.22% NS in 5% dextrose and the other received 0.45% NS in 5% dextrose. We studied the change in serum sodium levels from baseline at 24 & 48 hours and occurrence of dysnatremia. Ethical approval was obtained from institutional ethical committee.

**Results-** 68 children received 0.22% NS in 5% dextrose and 72 received 0.45% NS in 5% dextrose. Mean change in sodium levels from baseline between two groups (0.22% saline vs. 0.45% saline) was statistically significant (At 24 hrs:  $-2.75 \pm 4.61$  vs.  $+0.61 \pm 4.58$ ,  $p=0.0001$ ; At 48 hrs:  $-2.68 \pm 3.99$  vs.  $+0.68 \pm 4.23$ ,  $p = 0.0157$ ). The number of patients with hyponatremia was significantly higher in 0.22% saline group at 24 hrs [Moderate hyponatremia (125-129 mEq/l) - 5 vs. 0,  $p=0.025$ ; Mild hyponatremia (130-134 mEq/l) - 31 vs. 11,  $p=0.000$ ]. No hypernatremia was observed with 0.45% dextrose saline.

**Conclusions-** With the use of 0.22% dextrose saline, fall in serum sodium was significantly higher and there was more hyponatremia. 0.45% dextrose saline caused a minimal increase in mean serum sodium and no hypernatremia making it a more appropriate maintenance fluid.

**Competing interests-** None.

### Agreement between Invasive and Oscillometric Non-Invasive BP Measurements in Critically Ill Children

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**Background and objective:** Accurate measurement of BP is essential for the rational hemodynamic management of all critically ill children. The present study aimed to study the agreement between invasive and oscillometric non-invasive BP measurements in critically ill children of age less than 15 years admitted in Pediatric ICU of a tertiary level care hospital.

**Methods:** The prospective observational study was done by intra-patient comparison of two blood pressure measurement systems on 93 critically ill children of age less than 15 years having radial arterial catheter for continuous BP monitoring admitted in Pediatric ICU of a tertiary level care hospital. Ethical approval for the study was obtained from the institutional Ethics Committee.

**Measurements and Main Results:** A total of 1060 paired measurements of invasive and oscillometric non-invasive BP were taken on each subject at the time of enrolment and then every 3-4 hourly for 7 days or till the arterial catheter was in place, whichever occurred earlier. Invasive and oscillometric NIBP were taken simultaneously. Oscillometric NIBP was taken on right arm if arterial line was on left and vice-versa using a BP cuff appropriate to the child's arm. We assessed the agreement using Bland Altman analysis. Mean ( $\pm$ SD) differences between the invasive and oscillometric non-invasive BP for systolic,

diastolic and mean arterial BP measurements were  $-3.6 \pm 5.6$ ,  $-3.4 \pm 5.5$  and  $-3.4 \pm 5.5$  mm Hg respectively ( $p<0.05$ ). Bland Altman analysis showed fairly wide limits of agreement. When analyzed using age specific normo-, hypo- and hypertensive criteria, among normotensive group, the difference of invasive and non-invasive systolic (dSBP), diastolic (dDBP) and mean (dMAP) arterial BP measurements were  $-2.96$ ,  $-3.17$ ,  $-2.89$  mm Hg respectively ( $p<0.05$ ). The dSBP among hypotensive group ( $-3.4 \pm 3.93$  mm Hg) and dMAP among hypertensive group ( $-4.24 \pm 5.37$  mm Hg) also showed significant difference ( $p<0.05$ ). A good correlation was found between both methods.

**Conclusion:** As the limits of agreement were wide and oscillometric readings were overestimated, invasive method of BP monitoring should be used for monitoring critically ill children to get accurate blood pressure, whenever feasible.

### Effect of Estimated Glomerular Filtration Rate (eGFR) & Fluid Balance on Clinical Course and Outcomes of Children Admitted with Severe Dengue

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**Background and aims:** To measure estimated glomerular filtration rate (eGFR) at admission and fluid balance in the first 36 hours of ICU stay and assess their effect on disease course and outcomes in severe dengue. This was designed as a retrospective descriptive study in a tertiary level pediatric intensive care unit in South India.

**Methods:** Case records of all children fulfilling the WHO case definition of severe dengue were included, those who received intravenous fluid for less than 12 hours were excluded. Primary parameters measured included fluid balance in first 36 hours measured every 12 hours, durations of oxygen requirement, mechanical ventilation, ICU stay and total hospital stay.

**Results:** 26 children were enrolled, 14 boys and 12 girls. The median duration of ICU stay was 60 hours, and that of hospital stay 109 hours. eGFR was less than 60 ml/min in 6 patients (83.3% expired and 16.7% survived). eGFR, measured by modified Schwartz's formula, at the time of admission correlated inversely with requirement of oxygen therapy and mechanical ventilation ( $p<0.05$ ) and fluid balance in first 36 hours. Positive fluid balance (FO > 15%) in the first 36 hours was significantly higher in children who expired ( $p=0.011$ ). eGFR < 90 mL/min at admission had 100% sensitivity and 79% specificity to predict the possible occurrence of fluid overload >15% (Area under curve - 0.882)

**Conclusion:** Fluid balance in the first 36 hours had a significant positive correlation with mortality and negative correlation with eGFR. Children with admission eGFR < 90 mL/min may require restrictive fluid therapy to improve survival.

## Flexible Fiberoptic Bronchoscopy in Critically Sick Indian Children

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**Background:** Flexible fiberoptic bronchoscopy (FFB) remains a modality occasionally used in critically sick Indian children for a variety of reasons. This modality, however, is safe and helpful for both diagnosis as well as guidance of treatment. This study is a brief description of our experience with this modality.

**Materials and Methods:** This observational study was conducted in the PICU over a 15 month period from March 2012 till June 2013. Children requiring a bronchoscopy for predefined indications were enrolled in the study. A record was maintained of the indication for the procedure, the patient's clinical status, ventilator parameters, etc. The procedure was performed under continuous cardiorespiratory monitoring. A lavage sample was collected when indicated. Patient's vital parameters and ventilator settings, if any, were recorded before, during and upto 6 hours post procedure. The success in achieving objectives, both diagnostic and therapeutic was noted.

**Results:** FFB was performed in a total of 43 PICU patients during the study period. The mean age ranged between 1 month to 12 years. Of the 43 children studied 36 were males (83.7%).

The common indications were persistent radiographic shadows in the form of pneumonia (27.9%) or collapse (20.9%), suspected airway foreign body (20.9%) and acute stridor (16.3%). One patient was intubated using flexible bronchoscopy. The route for scope insertion was through the nostril in 26 patients (60.5%), via the endotracheal tube in 15 patients (34.89%) and through the LMA in 2 patients (4.65%). 15 (34.9%) of the patients were mechanically ventilated at the time of performing FFB. 2 patients were extubated within 6 hours of bronchoscopy after foreign body removal. 5 (33.33%) patients required increase in  $FiO_2$  post-bronchoscopy. The mean  $\pm$  SD increase in  $FiO_2$  from baseline was  $15.6 \pm 3.96$ . Increased PEEP requirements were seen in 4 patients (14%). The mean  $\pm$  SD increase in PEEP from baseline was  $2.8 \pm 1.5$ . 4 patients were on inotropic support during the procedure, and inotropic requirements was seen to transiently increased in 2. Definitive diagnostic clue to etiology was available in nearly 85% of patients who underwent the procedure

**Conclusion:** Flexible fiberoptic bronchoscopy in PICU patients has a high diagnostic yield, is safe and well tolerated.

## Bedside Sonographic Measurement of the Inferior Vena Cava Diameter Correlate With Central Venous Pressure in the Assessment of Intravascular Volume in Children

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**Background:** Volume status assessment is an important aspect of

patient management in the pediatric intensive care unit (PICU). Echocardiologist-performed measurement of IVC distensibility index (IVC-DI) provides useful information about filling pressures, but is limited by its portability, cost, and availability. Intensivist-performed bedside ultrasonography (INBU) examinations have the potential to overcome these impediments. We used INBU to evaluate hemodynamic status of PICU patients, focusing on correlations between IVC-DI and CVP.

**Study Design:** Prospective evaluation of hemodynamic status was conducted on 42 consecutive PICU patients with a brief (3 to 10 minutes) INBU examination. IVC-DI measurements were compared with invasive CVP values.

**Objective:** To determine bedside ultrasound (BUS) measurements of the IVC diameter correlate with central venous pressure (CVP) measurements.

**Methods:** 42 oro-tracheal intubated patients on positive pressure ventilation were included in the study. Inferior vena cava diameters were recorded by a subcostal view using M Mode. Distensibility index was calculated as follows:  $(D_{max} - D_{min}) / D_{min} \times 100$ .

**Results:** Of the 42 participants, 19 (45%) had a CVP  $< 8$  mmHg. 28 out of 42 (66%) children had a distensibility index  $> 46$ %. The sensitivity, specificity, positive predictive value and negative predictive value of a distensibility index  $\geq 0.18$  to predict a CVP  $< 8$  mmHg were 55.56%, 40%, 53% and 25%.

**Conclusion:** Based on these data, the IVC by INBU and invasive CVP are not having any correlation in acutely ill children.

## Impact of Early Fluid Overload in Critically Ill Children- A prospective observational study

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**Background and aims:** Fluid management has a major impact on duration, severity and outcome of critical illness.

**Aims:** To determine the impact of early fluid overload on mortality in critically ill children.

**Methods:** Critically ill children (1 month and 18 years of age) admitted in PICU for at least 24 hours were eligible for recruitment. Fluid overload (FO) was estimated by subtracting the sum of all fluid inputs from the sum of all fluid outputs on everyday for 72 hours after admission.

**Results:** 211 children were included. The difference in the mean daily fluid balance (ml/kg) between survivors and non-survivors was maximum at 48 hours ( $32.3 \pm 2.9$  vs  $46.7 \pm 5.0$ ,  $p = 0.01$ ). 85 patients (40.2%) developed  $< 10\%$  FO, 81 patients (38.4%) developed 10%-20% FO, and 45 patients (21.4%) developed  $> 20\%$  FO at 48 hours of ICU admission. Patients who developed  $> 20\%$  FO at 48 hours had significantly higher mortality (25/45;

55.6%) than those who had 10%-20% FO (27/81; 33.1%) and with < 10% FO (25/85; 29.4%). The adjusted odds of death in presence of early FO > 20% was 3.16 as compared to children with < 10% (p=0.02). The cumulative fluid balance (%) was significant more positive in AKI children versus non AKI (9.0 ± 7.11 versus 11.9 ± 9.2, p = 0.009).

**Conclusions:** Children who died in PICU accumulated more fluid in first 48 hours. Fluid overload > 20% at 48 hours was associated with 3 times increase mortality as compared to FO < 10%.

## Effect of Pre-hospital Transport and Patient Related Factors on Rates of PICU Admission Among Patients Presenting to the Pediatric Emergency Department of a Tertiary Care Centre

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**Background and Aims:** Data on the transport practices prevalent among patients presenting to the Pediatric emergency department (PED) of resource limited countries is scarce. Moreover, effect of these and other patient related factors on rates of ICU admission has also not been well studied. The aim of this study was therefore to evaluate the prevailing pre-hospital transport practices and study the effect of these and other patient related factors on rates of admission to the PICU.

**Methods:** Children presenting to the PED of our hospital over a period of 6 months (Jan-Jun 2013) were evaluated. We collected information on details pertaining to pre-hospital transport, and, their clinical parameters, and need for PICU admission. The study was approved by the IRB.

**Results:** A total of 319 patients presented to the PED during the study period. Nearly 61% (196) of the patients used public transport systems such as autorickshaw and bus to transport the children to the health care facility. Fifty four children (17%) required PICU admission and 19 (6%) were admitted to the wards. Severe sepsis/septic shock (26, 48%) was the commonest cause for PICU admission, followed by respiratory illnesses such as pneumonia and asthma (13, 24%). On univariable analysis, we found factors such as nature of illness (septic shock/pneumonia), Pediatric Index of mortality (PIM) 2 score and duration of illness before presentation to be significantly associated with need for PICU admission.

**Conclusion:** Public transport systems were commonly used to transport patients from home/ hospital to our centre. Nature of illness and the admission PIM2 scores predicted the need for PICU admission.

**Key words:** Pre-hospital transport; PICU admission; public transport; autorickshaw

## Continuous renal Replacement Therapy (CRRT) in Children With sepsis and Multi Organ Dysfunction Syndrome- Indian scenario

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**Background:** Sepsis with multi organ dysfunction syndrome (MODS) is a common occurrence in Pediatric Intensive Care Unit (PICU) in sick children. Unfortunately scanty literature is available regarding CRRT utility in sepsis with MODS from developing countries.

**Objectives:** To report our experience and emphasize the initiation of early CRRT in managing children with sepsis and MODS in a developing nation.

**Materials and methods:** Medical records of children required CRRT in PICU at Sir Ganga Ram Hospital from September 2010 to August 2014 were retrospectively analyzed to obtain data on demographic factors, mode of CRRT & its prescription, probable effect of CRRT on inotropic score, plateau pressures, P/F ratio, hemodynamic stability while on CRRT, anticoagulants, feasibility and complications.

**Results:** During the study period 23 children required CRRT (male-15). The median age was 11 years (13 months to 16 years) and median weight 39 kg (7.5 kg to 65 kg). 18 had primary diagnosis of sepsis with MODS, while 5 had severe Dengue fever with sepsis. At initiation of CRRT, all patients were receiving mechanical ventilation and inotropic support. 11 children (47.8%) had fluid overload (F.O) of >10% at the time of initiation of CRRT. 8 out of 11 survivors (72%) received CRRT within 48 hours of admission while in 7 out of 12 (58.4%) non-survivors CRRT was initiated after 48 hours. The median F.O among survivors and non survivors was 9.1% (2.9%-12.5%) and 7.4% (2.4%-14%) respectively but the mean serum creatinine in survivors and non survivors were 2.5 ± 0.8 SD and 3.5 ± 1.1 SD (p < 0.03) respectively. There was no statistically significant difference in the duration of ICU stay and CRRT, change in inotropic score and P/F ratios between the survivor and non-survivors. Total of 30 CRRT sessions amounting to 1142.4 hours were given. CVVHDF was preferred in all patients. The mean lifespan of filter was 47.62 hours. One patient had Intracranial bleed secondary to heparin usage as an anticoagulant. Manageable electrolyte abnormalities like hypokalemia, hypophosphatemia, hypomagnesaemia, hypocalcaemia were observed in 75%, 55%, 40%, 10% patients respectively. Clotting was the most common circuit related complication.

**Conclusion:** Early initiation of CRRT in children with sepsis and MODS may improve the survival but large sample size is required for validation in Indian scenario.