

This study aimed to compare respiratory variation in transthoracic echo-derived aortic blood flow velocity DVpeak and DIVCD with DVpeak and Doppler corrected flow times obtained by TOD.

Methods A prospective and comparative study conducted in pediatric intensive care unit investigated 11 mechanically ventilated children using TTE and TOD for each patient had tachycardia, hypotension, oliguria, delayed capillary refilling or hemodynamic instability despite vasopressor drugs.

Results VE induced significant changes in TTE and TOD, the DVpeak ao in responders was higher than that in non-responders [23% (15–32.1) vs.10% (6–14) by TTE and, [21% (14–29) vs.12% (11–13) by TOD, whereas DVCID and FTc did not significantly differ between groups.

Conclusion In this study, ΔV_{peak} was the most appropriate variable to predict fluid responsiveness by TTE and TOD. DIVCD and FTc are of little value in ventilated children.

15 CONVENTIONAL VS. RESTRICTIVE MAINTENANCE FLUID REGIME IN CHILDREN WITH SEPTIC SHOCK AFTER INITIAL RESUSCITATION: A RANDOMIZED OPEN LABEL CONTROLLED TRIAL

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Background Initial aggressive fluid resuscitation is of proven benefit in septic shock. Optimal post resuscitation fluid management is not known.

Aims To compare restrictive vs. conventional post-resuscitation fluid protocols in children with septic shock.

Methods We performed prospective randomized trial involving children (3 to 144 months) with septic shock admitted to our PICU. After initial resuscitation, patients were randomly assigned to restrictive (A) or conventional (B) fluid protocol. The primary end point was length of PICU stay. Secondary end points included: all cause mortality, organ failure free days, ventilator-free days, measures of lung physiology and incidence of AKI. All analyses were performed on intention-to-treat basis. Intergroup differences were tested with Students' t test, Chi-square and Mann Whitney U test as appropriate and ANOVA for repeated measures. Time to event data was analyzed with Kaplan-Meier method and Mantel-Cox log rank test.

Results In 12 months period, total of 101 children were enrolled. The baseline characteristics of both groups were similar. The mean (\pm SD) cumulative fluid balance in initial ten days was - 42.6 \pm 82.6 ml (group A) and 339 \pm 117 ml (group B) ($P < 0.001$). As compared to Group B, group A showed significantly more PICU free days [17.2 \pm 9 vs. 12.7 \pm 9.5 days; $p = 0.015$], lesser number of organ failures [$p = 0.001$], higher proportion of patients recovering from organ failure [92.5 vs. 75%; $p = 0.005$], improved oxygenation index and plateau pressure [$p = 0.001$], lesser duration of ventilation [6.3 \pm 5.8 vs. 9.9 \pm 5.2 days; $p = 0.012$], early recovery from shock [92.5 \pm 68.8 vs. 123 \pm 87 hours; $p = 0.05$]. Mortality was similar [18.5 vs. 23.4%; $p = 0.54$].

Conclusions Restrictive fluid strategy improved lung function; shortened ventilation and ICU stay without aggravating the hemodynamic instability.

16 DELAYED CORD CLAMPING AND NEED FOR TRANSFUSIONS

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The requirement of donor blood transfusions is a common problem in the treatment of preterm infants, especially below 32 weeks' gestation. Upto 50% of these infants receive at least one transfusion during their hospital stay. Studies on enhancing placento-fetal transfusion have demonstrated a significant increase in circulating blood volume in preterm infants if the cord is either not clamped immediately after birth or is milked several times. The recent updated Cochrane review showed positive benefits of placento-fetal transfusion with regard to better adaptation (e.g. higher blood pressure) after birth as well as reduced intra-ventricular haemorrhage and necrotizing enterocolitis. Infants receiving extra placental blood at birth have a reduced need for donor blood transfusions during the first six weeks of life. The talk will focus on a structured review of the available literature. In addition other preventative measures of anaemia of prematurity such as early protein and iron supplementation will be reviewed.

17 RED BLOOD CELL TRANSFUSIONS IN CHILDREN

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All our cells need oxygen for their metabolism. Oxygen delivery is dependant on cardiac output, hemoglobin and arterial blood saturation. Therefore, red blood cells (RBC) transfusions could seem to be the best therapy to increase oxygen delivery in critically ill children. However, RBC transfusions are associated with an increased morbidity and mortality. This might be due to the storage lesions, which decrease the stored RBC's ability to transport oxygen in the microcirculation, and modify their immunomodulative properties. Therefore, one must carefully select the patients for whom the benefits will be greater than the risks.

For unstable critically ill children, it is usually recommended to transfuse for a Hb threshold of 100 g/L, after correcting the cardiac output.

For critically ill children, it is recommended to transfuse for a Hb threshold of 70 g/L. This threshold has also been validated for septic patients as well as surgery and cardiac surgery patients. For single-ventricle physiology patients, it seems reasonable to transfuse RBC units for a threshold of 90 g/L. For neonates, a higher threshold is used (Hb 120–140 g/L if $FiO_2 > 40\%$, Hb 100 g/L if $FiO_2 < 40\%$, Hb 70–80 g/L for asymptomatic infants). Lower thresholds have been proposed for chronically anemic children (Hb 50 g/L).

RBC transfusions are a common treatment, but one must be aware of the associated risks and the appropriate transfusion indications, in order to prevent unnecessary morbidity and mortality.

18 HEAD-TO-BODY DELIVERY BY 'TWO-STEP' APPROACH: EFFECT ON UMBILICAL ARTERY HEMATOCRIT AND PH

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Background The timing of umbilical cord clamping has a profound effect on the amount of blood that remains in the infant's circulation at birth. However, there is no evidence to support a relationship between cord clamping time and other active management techniques of labor.

Objective To examine the association between head-to-body delivery by 'two-step' approach, that include waiting for the next contraction to deliver the shoulders, and early cord clamping (< 1 min) and its effect on the amount of blood that remains in the infant's circulation at birth and cord artery blood gas parameters.

Study Design Prospective observational study on 50 consecutive at term, uncomplicated vaginal deliveries with singleton cephalic

fetuses during January 2012 in Policlinico Abano Terme, Abano Terme, Italy. Cord arterial blood gas parameters and hematocrit (Hct) were compared to the reference values obtained in 50 healthy, control neonates, matched for gestational age, vaginally delivered by 'one-step' approach. Data analysis was performed with SPSS for Windows statistical package (version 13).

Results In our study population, head-to-body interval was timed and was always inferior to 3 minutes. The groups had similar demographic and biomedical characteristics at baseline. The mean cord artery hematocrit (Hct 50.2 vs. 44.9; $p < 0.001$) levels were significantly higher in the head-to-body interval 'two-step' approach group, but there was no significant difference in the umbilical artery pH (7.30 vs. 7.29; $p = 0.45$).

Conclusion Head-to-body delivery by 'two-step' approach increases the red cell mass in term infants and does not increase the risk of neonatal academia.

19 LATE CORD-CLAMPING IMPROVES CIRCULATION IN NEONATES

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Aim was to investigate the effects of late vs. early cord clamping on systemic circulation cerebral blood flow velocity (CBFV) in pre-matures infants < 1500g in a randomized trial.

Subjects 35 neonates were studied 4 hours after caesarean section. In 19 neonates (birth weight: 1140±240g; gestational age: 29.0±2 wks) the umbilical cords were clamped after 30 seconds and the infants were placed 30 cm below placenta level (LCC), and in 16 (1180±270g; 28.6±2 wks) the cords were clamped immediately (ECC).

Methods MBP (mmHg), left ventricular output (LVO, ml/kg/min), mean cerebral blood flow velocity (CBFV) in the Arteria carotis interna (ACI, m/s; Doppler), hemoglobin (Hb, g/dl), and hematocrit (Hct, %) were measured. Systemic and cerebral hemoglobin transport (HbT), systemic vascular resistance (SVR; mmHg/kg/min⁻¹) were estimated. Statistic: *unpaired t-test.

Abstract 19 Table 1

Results	ECC	LCC	p-value
MBP	34±3	45±7	0.03
LVO	229±44	258±36	ns
ACA	0.15±0.03	0.21±0.05	ns
SVR	123±40	145±30	0.05
Hct	0.44±0.4	0.56±0.5	0.002
cerebral HbT	7.4±1.8	11.1±4.1	0.04
systemic HbT	154±27	181±24	0.05

Conclusions Late cord clamping improves blood pressure, systemic vascular resistance, hemoglobin, systemic and cerebral hemoglobin transport. The ECC group required more volume expansion in the first 24 h (ECC: 12/16, 14±7ml/kg; LCC: 6/19, 5±4ml/kg; $p < 0.03$).

20 DELAYED VERSUS EARLY UMBILICAL CORD CLAMPING: DEVELOPMENTAL OUTCOMES AT 4 MONTHS IN SWEDISH INFANTS

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Background Delayed cord clamping is associated with increased neonatal hemoglobin levels, and improved iron status in infants at 4–6 months. There are no previous studies evaluating effects from timing of clamping on development in term infants.

Objective Does the time for umbilical cord clamping affect psychomotor development evaluated with Ages and Stages Questionnaire (ASQ) in 4-month infants?

Design/methods Randomized controlled trial investigating effect of delayed cord clamping (≥180 sec, DCC) versus early cord clamping (≤10 sec, ECC) in 382 full-term normal deliveries. After 4 months, parents reported their infant's development by the ASQ.

Results 365 (96%) questionnaires were returned. The mean total ASQ score did not differ between groups. The DCC group had a higher mean score (SD) in the domain problem solving, 55.3 (7.2) vs. 53.5 (8.2), $p = 0.03$ and a lower score in personal-social; 49.5 (9.3) vs. 51.8 (8.1), $p = 0.01$. There were no difference between the DCC and ECC groups concerning the frequency of infants under cut-off score (table).

Abstract 20 Table 1

	DCC n(%)	ECC n(%)	p
Communication < 33.3	4 (2.2)	4 (2.2)	1.0
Gross motor < 40.1	17 (9.2)	19 (10.6)	0.7
Fine motor < 27.5	6 (3.2)	12 (6.7)	0.15
Problem solving < 35	3 (1.6)	7 (3.9)	0.21
Personal-social < 33	8 (4.3)	8 (4.4)	1.0

Infants below cut off score in ASQ domains at 4 mo

Conclusions There was no overall effect of DCC on neurodevelopment assessed at 4 months of age. The possible effects on the domains will be further investigated in a follow-up study.

21 DELAYED CORD CLAMPING IN PRETERM INFANTS (< 32 WEEKS OF GESTATION): CURRENT CLINICAL PRACTICE IN THE UNITED KINGDOM

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Background Resuscitation guidelines recommend delayed cord clamping in term infants and this practice is being widely adopted in the UK. But there are no clear recommendations for early or delayed cord clamping in preterm infants.

Aims and objectives To find out the current UK clinical practice in early or delayed cord clamping in the preterm infants.

Study Design and methods Questionnaire based study carried out via internet tool (SurveyMonkey) followed by telephone interview from non-responders. Questionnaire completed by consultants, registrars or senior neonatal sisters (band 6 and above).

Results 100% response rate from all the 222 units providing neonatal care in the UK. Currently 24% units (52 of 222 units) delay cord clamping or practice other means to facilitate placental transfusion in preterm infants while 63% units have early cord clamping practice and no response from 8% units.

46% (24 of 52 units) delay cord clamping for 31–60 seconds, 17% delay for < 30 seconds, 14% delay for 61–120 seconds and 2% delay for 121–180 seconds. 8% units (4 of 52 units) practise cord milking to facilitate placental transfusion while 13% provided other means of facilitating placental transfusion.

Conclusion Current clinical practice in cord clamping in preterm infants varies significantly in the UK. Despite research showing benefits without any significant adverse effects only 24% units delay cord clamping or use others means to facilitate placental transfusion. A randomised control trial is needed to provide further