

in developmental vascular patterning in humans. NFATc4 expression decreased significantly and NFATc2 expression remained unchanged, requiring further research. These results suggest that NFAT is involved in fetal vascular development.

1701 DOPPLER ECHOCARDIOGRAPHIC EVALUATION OF PULMONARY ARTERY PRESSURE IN LOW BIRTH NEWBORN WITH ABDOMINAL COMPARTMENT SYNDROME AFTER ABDOMINAL SURGICAL

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In this prospective study 16 newborn (ranging 1 day - 28 day) with severe compartment abdominal syndrome were evaluated by Doppler echocardiography for the presence of pulmonary hypertension (PH). The goal of this study was to determine the frequency of PH in newborn with severe compartment abdominal syndrome because the diagnosis of PH influenced the treatment of pneumonia in these newborns.

The patients who had more than 25.4 ± 1.2 mmHg (mean \pm SD) of systolic pulmonary arterial pressure were considered to have PH. In our study PH was found in 13 (81.25 %) of 16 newborn. We did not find any significant difference for the parameters including the age, weight, height, clinical symptoms, signs (tachycardia and tachypnea), and laboratory findings such as hemoglobin, PCO_2 , HCO_3 and PO_2 between the patients with and without PH ($p > 0.01$). However, there was a significant difference in cyanosis, cardiac failure, blood pH level, intra-abdominal pressure and O_2 saturation measured by pulse oximetry between the patients with and without PH ($p < 0.01$).

1702 INCREASE PLASMA ENDOTHELIN-1 LEVELS ARE ASSOCIATED WITH LUNG HYPERTENSION IN LOW BIRTH NEWBORNS WITH OMPHALOCELE

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Objective Increased pulmonary vascular resistance in low birth newborn with omphalocele is suggested, and endothelin-1 plays an important role in pulmonary vascular reactivity in newborns.

Methods We determined plasma (second sample) levels of endothelin-1 in 12 low birth newborns with omphalocele and 14 without omphalocele (gestational ages: 26.2 ± 1.4 and 25.4 ± 1.6 weeks, respectively). Blood and a second blood sample taken 18 to 40 h after birth were used for endothelin-1 determination by enzyme immunoassay.

Result Plasma levels ET-1 concentrations were higher than second sample ET-1 levels in both groups ($p < 0.001$). There was a significant positive correlation between second sample ET-1 and SNAPPE II ($r = 0.32$, $p = 0.01$). There were no correlations between plasma ET-1 levels first sample and second sample ET-1 concentrations and 5-min Apgar score < 6 . Duration of mechanical ventilation had a significant positive correlation with second sample ET-1 ($r = 0.46$, $p = 0.02$). Plasma level ET-1 levels did not differ between control and omphalocele (13.0 and 14.6 pg/mL, respectively, $p = 0.80$). Second sample ET-1 levels had significantly higher ET-1 levels than controls (1.32 and 6.04 pg/mL, respectively, $p = 0.001$).

Conclusion Our low birth newborn with and without omphalocele had similar plasma ET-1 levels, whereas ET-1 levels were higher in omphalocele than in control newborns 18 to 40 h after birth. The increased vascular resistance in omphalocele may be related to high ET-1 levels.

1703 THE USE OF INHALED NITRIC OXIDE IN A TERTIARY PAEDIATRIC INTENSIVE CARE UNIT (PICU)

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Aims Inhaled nitric oxide (iNO) is used to reduce pulmonary vascular resistance and improve ventilation-perfusion mismatch. This study investigates the use of iNO in a tertiary PICU - Looking at evidence of objective assessment of its benefit (important for weaning/cessation of treatment). iNO costs £40/hour for the first 96 hours & free thereafter. Total spend in this tertiary Children's Hospital in the UK was approx £240,000 per annum in 2010-11.

Methods All patients receiving iNO were identified. Data was collected prospectively from the bedside (hours on iNO) and retrospectively from case notes/electronic patient records.

Results 107 patient episodes were analysed; 63% were admitted for cardiac surgery and 66% received iNO for < 96 hours. Analysis focused on 52 patients over 6 months. Indication for iNO was documented in 75% of cases; 48% of these patients had an echocardiogram prior to iNO. Of those in whom the indication was Pulmonary hypertension 65% had an echo, 35% had no echo. 52% of these were cardiac surgical patients. In those in whom the indication was low oxygen saturations 36% had an echo and 64% no echo. Oxygen saturations and objective improvement measures were not routinely recorded in patient records pre/post iNO.

Conclusions Main indications for iNO were pulmonary hypertension (36%) or low oxygen saturations (27%). 48% of patients didn't have an echo and oxygen saturations were not documented pre/post iNO. The use and effect of an expensive though potentially beneficial drug needs to be assessed and documented to justify its continued use.

1704 CEREBRAL OXYGEN SATURATION AND EXTRACTION IN NEONATES WITH PERSISTENT PULMONARY HYPERTENSION DURING THE FIRST 72 HOURS OF LIFE

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Background and Aim Persistent pulmonary hypertension (PPHN) is a life-threatening condition treated with high oxygen concentrations in inspired air (FiO_2). Little is known about the course of cerebral oxygen saturation ($r_c\text{SO}_2$) and extraction (FTOE) in neonates with PPHN. Our aim is to explore the course of $r_c\text{SO}_2$ and FTOE in neonates with PPHN during the first 72 hours of life.

Methods In term neonates with PPHN $r_c\text{SO}_2$ was measured with near-infrared spectroscopy. Simultaneously, arterial oxygen saturation (SpO_2) was measured and FTOE was calculated: $(\text{SpO}_2 - r_c\text{SO}_2) / \text{SpO}_2$. We obtained clinical factors such as pH, pCO_2 , blood pressure, NO-therapy, sedatives and inotropics. We used Wilcoxon test and Spearman's correlation to test significance.

Results We included six neonates (median GA 40+2wk, BW 3900g). $r_c\text{SO}_2$ increased from day 1 to day 2 ($p = 0.028$) and FTOE decreased from day 1 to day 2 ($p = 0.027$).

Abstract 1704 Table 1 The course of $r_c\text{SO}_2$, SpO_2 and FTOE (median, range)

	Day 1	Day 2	Day 3
$r_c\text{SO}_2$	77.5 (50-88)	82 (54-94)	78 (59-94)
SpO_2	97 (92-99)	97 (88-98)	97 (88-97)
FTOE	0.19 (0.10-0.43)	0.12 (0.0-0.35)	0.16 (0.03-0.27)

Clinical factors were not associated with $r_c\text{SO}_2$ and FTOE, but $r_c\text{SO}_2$ was nearly significantly positively associated with midazolam at day 2 ($p=0.05$), and negatively with $p\text{CO}_2$ at day 3 ($p=0.051$).

Conclusions Highest $R_c\text{SO}_2$ -values and lowest FTOE-values were seen on day two, suggesting decreased oxygen consumption, possibly as a consequence of midazolam treatment. Even so, treatment with high FiO_2 did not lead to high levels of oxygen in brain tissue in most infants.

1705 NITRIC OXIDE DELIVERY WITH A NOVEL VENTILATOR CIRCUIT CONNECTOR - AN *IN VITRO* STUDY UNDER NEONATAL VENTILATORY CONDITIONS

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Introduction PPHN is treated with inhaled nitric oxide (iNO). A novel ventilator circuit connector (NVCC, AFFECTAIR®, Discovery Laboratories, Inc., Warrington, PA) has been developed to simplify the delivery of aerosols to patients receiving ventilatory support. We hypothesized that use of the NVCC for iNO delivery would substantially reduce NO consumption.

Aim To compare the NVCC with the SoC in the delivery of iNO under simulated neonatal ventilator conditions.

Material and Methods A pediatric/neonatal test system with Babylog® VN-500 with various inspiratory pressures, test lung, and ASL-5000 lung simulator were used. For SoC measurements, using a standard wye connector, the iNO was delivered per the manufacturer's instructions. With the NVCC, iNO was administered by introducing the NO via a tube attached directly to the NVCC. NO concentrations were measured with a NOxBOX®+ analyzer and NO flow was recorded by Electronic Nitric Oxide flow controller abd titrated to 20 ppm at the patient interface.

Results Compared with SoC, there was a 2 to 3 fold decrease in NO flow requirements to achieve desired iNO concentration with the NVCC. The delivery of O_2 was not different between the study conditions. NO_2 levels were slightly higher for the NVCC group, but never higher than 1.13 ppm.

Conclusion The NVCC significantly decreased the NO flow required for targeted delivery of 20 ppm. The NVCC allows for simplified therapeutic gas delivery with reduced NO utilization. These results warrant further study of NVCC on compatibility assessment with various modes of ventilation and delivery of other medical gases.

1706 VALUE OF ECHOCARDIOGRAPHY FOR THE DIAGNOSIS AND MONITORING OF EVOLUTION OF PERSISTENT PULMONARY HYPERTENSION IN NEWBORN

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Purpose To evaluate the value of the echocardiographic exam for the diagnosis of the persistent pulmonary hypertension (PPHN) in the newborn infant.

Methods Patients, 41 newborns (aged 0–8 days) with PPHN induced by severe perinatal hypoxia, meconium aspiration syndrome, hyaline membrane disease, hypothermia, neonatal sepsis, infant of diabetic mothers, congenital cardiac malformations. Investigations of patients: clinical exam PaO_2 , ECG, chest X ray, Doppler echocardiography (ECHO). ECHO was repeated after 5–7 days in all patients.

Results Physical exam, cyanosis in the first 12 hours, tachypnea and/or a severe respiratory distress, systolic murmur on the left border of sternum. ECG: diastolic dysfunction of left ventricular (LV). Chest X ray: cardiomegaly (all cases). PaO_2 : low values-all patients. ECHO aspects: enlargement of the right chambers; severe tricuspid regurgitation with the peak velocity 3–4 m/sec; mitral regurgitation (12/41 of cases), left-to-right shunt across foramen ovale and/or ductus arteriosus (30/41 of cases), enlargement of the pulmonary artery and severe pulmonary regurgitation, septal hypertrophy (11/41 of cases); impaired LV relaxation with normal systolic function; congenital heart diseases (7). Repeated ECHO revealed in most of the cases diminished or no right-to left shunt across ductus arteriosus or foramen ovalae correlate with clinical improvement and disappearance of cyanosis.

Conclusions Echocardiographic exam, beside clinical exam and history of the disease, is an important element for the diagnosis and follow up of evolution by the specific treatment applied for PPHN in the newborn with cyanosis and this investigation must be performed early after birth.

1707 RATE AND MANAGEMENT PATTERN OF CONGENITAL DIAPHRAGMATIC HERNIA AT MATERNITY HOSPITAL, KUWAIT

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Introduction & Objectives: Congenital diaphragmatic hernia (CDH) occurs in around 1 in 2000 live births and associated with high mortality rate reaching up to 50%, even with prenatal diagnosis and recently advanced and extensive neonatal intensive care management. The objectives of this study are to document the incidence, clinical experience and outcomes of congenital diaphragmatic hernia (CDH) in newborn infants admitted to the neonatal unit at Maternity Hospital, Kuwait.

Methods and Materials A retrospective chart review of all newborn infants admitted to the neonatal unit at Maternity Hospital in Kuwait from January 2007 till December 2010. Demographic data of the babies were collected along with variables involving the levels of sickness and therapeutic interventions.

Results A total of 21 cases of CDH were admitted to the unit over the four years period. The gestational age ranged from 33 to 40 weeks. 13 cases died giving a mortality rate of 61.9%. All the cases received mechanical ventilation, and 16 of them was high frequency ventilation (HFO), while almost half of the cases received nitric oxide gas treatment. Almost all the cases were on 100% oxygen.

Conclusions Our results showed a little higher mortality than other centers worldwide, in spite our management pattern was not different. More cases need to be collected from the neonatal units in the other hospitals in Kuwait to compare the mortality rates and patterns of management.

1708 ROLE OF COMPUTED TOMOGRAPHY (CT) IN PEDIATRIC RESPIRATORY DISEASES

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Respiratory illness is one of the major causes of morbidity and mortality in children. CT lung has some advantages over plain chest radiography but exposes the child to more radiation. This study was carried to determine the value of performing lung CT in the management of children with respiratory diseases and to summarize the main indications for ordering pulmonary CT in Pediatrics.