

MAES Esmail, MYZ El-Abdin, M Abd El-Salam, M Yousri Ibrhim, SSM Koraa, E Mahmoud. *Pediatric, Al Asher University, Cairo, Egypt*

**Background** Oxidative effects of phototherapy on cell membranes and cell components may have a wide range of potential adverse effects, including DNA damage. Apoptosis is an indispensable mechanism for maintaining many cellular functions, including cell replication, and removal of damaged cells with high burden of genetic mutations. Many genes function as apoptosis regulatory genes. Examples of these genes include the BCL2 gene which is an anti-apoptotic oncogene, and the BAX gene which acts as a promoter of apoptosis.

**Objectives** Assess the effect(s) of phototherapy on DNA and on rate of apoptosis in full term neonates with hyperbilirubinemia. It comprised 35 neonates with indirect hyperbilirubinemia who received phototherapy for 48 hours, and 20 apparently healthy full term neonates with normal serum bilirubin level, as a control group. DNA damage was assessed by DNA fragmentation and micronucleus assay. Determination of the anti-apoptotic, (BCL2) protein, and Bax gene expression status.

**Results** The frequency of micronuclei in circulating lymphocytes of neonates who received phototherapy has significantly increased before and after phototherapy compared to controls. DNA fragmentation in circulating lymphocytes, was significantly higher among cases before and after phototherapy compared to controls. The plasma BCL2 protein was significantly lower in the cases before and after phototherapy compared to controls. and Bax gene expression was significantly high among cases before and after phototherapy compared to controls.

**Conclusions** Phototherapy induces more DNA damage and enhances apoptosis of exposed cells, probably through down regulation of BCL2 expression and upregulation of bax gene expression in neonates with hyperbilirubinemia.

### 1551 IMPROVING SAFETY OF VASCULAR CATHETER INSERTION IN HIGH-RISK NEWBORNS THROUGH STANDARDIZED TEACHING

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<sup>1</sup>KS Lee, <sup>2</sup>A Jefferies, <sup>3</sup>M Dunn. <sup>1</sup>Hospital for Sick Children; <sup>2</sup>Mount Sinai Hospital; University of Toronto; <sup>3</sup>Sunnybrook Health Sciences Centre, Toronto, ON, Canada

**Background** Umbilical and percutaneous central catheter placement in high-risk newborns are common NICU procedures with high complication rates, particularly when inserter experience varies. We developed, implemented and evaluated a standardized catheter insertion training program for NICU clinicians to improve patient safety.

**Methods** Seventy-one clinicians were surveyed to assess learning needs. Using the results, a program that included a manual, didactic seminars, self-study electronic module, pocket cards and low-fidelity simulation for practice and feedback was developed. Effectiveness was assessed with pre- and post-training multiple choice knowledge tests and Xray quiz focused on recognition and management of catheter malposition, plus a post-training simulation performance test. Malposition of catheters inserted in the NICU was the primary outcome.

**Results** Real-life practice and simulation were the highest rated teaching methods. Seventy-six clinicians completed at least one program component over 3 months. Post-training knowledge scores (65±11% vs 85±9%, n=65, mean±sd) and Xray scores (59±13% vs 69±16%, n=60) improved significantly compared to pre-training (p<0.01). Performance checklist score was 88±8%. Learner satisfaction was high. Catheter malposition rate decreased from 56% (n=292) to 36% (n=374) (p>0.05).

**Conclusions** A standardized training program resulted in improved knowledge and recognition of catheter malposition but not a significant decrease in malposition rate in the NICU.

### 1552 IMPROVING CONTROL OF THE OXYGEN SATURATION DURING RESUSCITATION OF PRETERM INFANTS WITH THE USE OF TREND MONITORING

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<sup>1</sup>T Goos, <sup>2</sup>D Rook, <sup>1,2</sup>AC van der Eijk, <sup>2</sup>AA Kroon, <sup>1</sup>J Dankelman, <sup>2</sup>IKM Reiss. <sup>1</sup>Biomechanical Engineering, Delft University of Technology, Delft; <sup>2</sup>Pediatrics, Division of Neonatology, Erasmus MC - Sophia, Rotterdam, The Netherlands

**Background** The European Resuscitation Council (ERC) guidelines prescribe oxygen saturation (SpO<sub>2</sub>) targets for the first 10 minutes of resuscitation after birth. Unfortunately, the control of SpO<sub>2</sub> in newborn infants is difficult.

**Objectives** To determine whether a device that displays trend lines, reduced deviation from SpO<sub>2</sub> targets during resuscitation of very preterm infants after birth.

**Methods** In a single-centre study, deviation from the SpO<sub>2</sub> targets during resuscitation of preterm infants (gestational age (GA) ≤30 weeks) with the aid of a newly developed graphical interface, displaying the trends of SpO<sub>2</sub>, fraction of inspired oxygen (FiO<sub>2</sub>), was compared with current clinical practice. Data presented as median (IQR).

**Results** Ten infants (GA 27<sup>4</sup>/<sub>7</sub> (25–28<sup>3</sup>/<sub>7</sub>) weeks, birth weight (BW) 812g (694–1068g)) were resuscitated using the graphical interface and 42 infants (GA 27<sup>5</sup>/<sub>7</sub> (25<sup>6</sup>/<sub>7</sub>–29<sup>1</sup>/<sub>7</sub>) weeks, BW 930g (760–1148g)) were included in the control group. We found that infants resuscitated with the graphical interface spend less time above the SpO<sub>2</sub> targets (18% (4–24%) vs. 26% (13–42%)), and had a smaller deviation during the time spend above the SpO<sub>2</sub> targets (2.3%SpO<sub>2</sub> (1.2–3.8%SpO<sub>2</sub>) vs. 3.8%SpO<sub>2</sub> (2.5–6.3%SpO<sub>2</sub>)). Both time spend below the SpO<sub>2</sub> targets (29% (21–39%) vs. 24% (14–34%)), and deviation below the target (10.5%SpO<sub>2</sub> (8.3–25.9%SpO<sub>2</sub>) vs. 7.1%SpO<sub>2</sub> (1.9–11.7%SpO<sub>2</sub>)) increased.

**Conclusion** The use of a graphical interface decreased high SpO<sub>2</sub> levels during the resuscitation of preterm infants. However, both time spend and deviation below the SpO<sub>2</sub> targets increased. It appears the current ERC guidelines are interpreted as the maximum acceptable SpO<sub>2</sub>, a target range would clarify the acceptable deviation.

### 1553 THE RISK OF RE-OCCURRENCE OF CANCER TUMORS IN CHILDREN POST DIAGNOSIS AND TREATMENT

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E Odiase. *Epidemiology, University of Ibadan/SmokeFree Foundation, Abuja, Nigeria*

**Background** It is very imminent that the tissues of infants are immature thereby increasing the risk of re-occurrence of tumours after surviving cancer.

**Methods** This study was conducted for 6 years amongst 400 children who had earlier survived cancer and treated between 2005–2011 at the University of Ibadan Teaching Hospital (Paediatric ward). They were evaluated for re-occurrence of tumours.

**Results** The findings were that 5 re-occurrences were noticed in 6 of the children in a median time of 6 years. The 5 second malignancies were: 1 acute myeloblastic leukemia (AML), 2 breast cancers and 2 sarcomas. The primary diagnosis were Ewing's sarcoma, osteosarcoma, non-Hodgkin's lymphoma and neuroblastoma. Two of these children had received multiple therapies for recurrences. A Ewing sarcoma patient developed sarcoma after 4 years, an osteosarcoma patient developed breast cancer after 4 years, an ALL patient developed Ewing sarcoma after 3 years, a mesenchymal chondrosarcoma patient developed breast cancer and osteosarcoma. A soft tissue sarcoma, and an osteosarcoma developed in two bilateral retinoblastoma patients, a sarcoma developed in a rhabdomyosarcoma patient after 6 years and in a patient treated for nasopharyngeal carcinoma after 3.5 years all in the radiation field.