

# Latin American Society for Pediatric Research (LASPR)

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### 1 RESPIRATORY MUSCLES WEAKNESS PATTERN IN CHILDREN AND ADOLESCENTS WITH CHRONIC RESPIRATORY DISEASES

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**Background:** Weakness of the respiratory muscles is determined by the fall in the maximum inspiratory (MIP) and expiratory (MEP) pressure in children and adolescents with chronic respiratory diseases (CRD). However, the relation between these variables has not been studied in this group of patients. This study was aimed to evaluate the strength of the respiratory muscles and to compare MEP/MIP ratio between patients with CRD and healthy individuals.

**Methods:** Case-control study. Individuals with neuromuscular disease (NMD) and post-infectious bronchiolitis obliterans (PIBO) were considered. In addition, they were also matched according to anthropometric and demographic characteristics with healthy children and adolescents. MIP, MEP in the 3 groups, and pulmonary function only in patients with CRD were recorded.

**Results:** A total of 52 subjects with CRD (25 NMD and 27 PIBO) and 85 healthy individuals were included, with an average age of  $11.3 \pm 2.1$  years. Patients with NMD and PIBO presented lower MIP and MEP compared with healthy individuals, although MEP/MIP ratio was lower in patients with NMD ( $0.87 \pm 0.3$ ) and higher in patients with PIBO ( $1.1 \pm 0.3$ ) compared to the healthy group ( $0.97 \pm 0.2$ ). Only in patients with NMD a negative correlation was observed between MEP/MIP ratio and age ( $r = -0.50$ ;  $p = 0.01$ ).

**Conclusion:** Differences in the pattern of muscular weakness between patients with CRD were observed. In patients with NMD a decrease in the MEP/MIP ratio depending on MIP was verified; and in those patients with PIBO an increase in the MEP/MIP ratio depending on MIP was also observed.

**Disclosures:** No conflict of interest to disclose.

### 2 PRO-INFLAMMATORY ACTIVITY AND OXIDATIVE STRESS ON CULTURES OF CYSTIC FIBROSIS HUMAN RESPIRATORY EPITHELIUM

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**Background:** Cystic fibrosis (CF) cellular dysfunction can generate inflammation and oxidative stress. Interleukin 1 beta (IL-1 $\beta$ ) and mitochondria seems to be key in those situations.

**Objectives:** To study dynamics of IL-1 $\beta$  and mitochondrial activity in CF respiratory epithelial cultures.

**Methods:** A CF respiratory epithelial line and the same line with cystic fibrosis transmembrane conductance regulator (CFTR) gene re-established were cultured. Both were treated with IL-1 $\beta$ , anti-IL-1 $\beta$ , anti-IL-1 $\beta$  receptor, and CFTR inhibitor. In other experiments intracellular chloride (Cl<sup>-</sup>) was increased through ionophores. Intracellular IL-1 $\beta$ -mRNA, immature and mature IL-1 $\beta$ , and secretion of IL-1 $\beta$  were measured. Mitochondria were isolated and activity of Mitochondrial Complex 1 (mCx-I) and levels of free oxygen radicals (ROS) in cytosol and mitochondria were determined.

Statistical analysis: ANOVA and Tukey tests.

**Results:** CF cells release 40% more IL-1 $\beta$  than controls. Inhibition of CFTR in control cells increase IL-1 $\beta$ . Intracellular Cl<sup>-</sup> is greater in CF cells and in controls with inhibited CFTR. The increase of intracellular Cl<sup>-</sup> by ionophores increase mRNA IL-1 $\beta$ , immature and mature IL-1 $\beta$ , and its secretion. Anti IL-1 $\beta$  and IL-1 $\beta$  receptor blockage inhibited these changes. The increase in IL-1 $\beta$  was associated with 50% reduction in mCx-I and increase in ROS. IL-1 $\beta$  also reduce mCx-I and increase ROS in cells with re-established CFTR. IL-1 $\beta$  blocker or anti-IL-1 receptor restores mCx-I activity and reduces ROS in CF cells.

**Conclusion:** CFTR dysfunction increase intracellular Cl<sup>-</sup> and that promotes maturation and release of IL-1 $\beta$ . Autocrine action of IL-1 $\beta$  on his receptors increases mRNA-IL-1 $\beta$ , generating a proinflammatory loop. This induce mitochondrial dysfunction and oxidative stress.

**Disclosures:** No conflict of interest to disclose.

### 3 DOCOSAHEXAENOIC ACID PERCENTAGE IN BREAST MILK OF MOTHERS RECEIVING CARE AT THE HEALTH OBSERVATORY OF A PUBLIC HOSPITAL FROM LA PLATA, ARGENTINA

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**Background:** Levels of some nutrients such as docosahexaenoic acid (DHA) in breast milk should be improved to optimize maternal nutritional status. DHA is one of the main components of synaptosomal membranes and myelin sheaths; and essential for child neurodevelopment.

**Objective:** Determine DHA percentage in breast milk of mothers receiving care at the public healthcare sector.

**Methods:** Descriptive, cross-sectional study analyzing milk samples obtained from adult mothers attending Instituto de Desarrollo e Investigaciones Pediátricas (IDIP) Health Observatory 90 days after delivery, in the period 2015-2016. Milk samples were obtained by complete breast emptying at the same times. DHA percentage was determined by gas chromatography. A survey of frequency intake of DHA precursors and sources was performed considering local consumption habits. DHA normality values were analyzed with Shapiro Wilk test. Following international reference recommendations, DHA cutoff value was set at 0.3% of the total fatty acids present in milk. The study protocol was approved by IDIP’s Institutional Research Review Board.

**Results:** The study included 38 exclusively breastfeeding mothers. Median DHA in milk was 0.14% (0.12-0.21). Maternal consumption of DHA precursors and sources could not be estimated since only 12% reported fish consumption during the last month (hake) and none of them received supplements or consumed canola oil, flaxseeds, pumpkin seeds or dried fruits. Maternal milk DHA levels were lower than the minimum recommended by different authors in 92% of milk samples.

**Conclusion:** Milk samples from exclusively breastfeeding mothers analyzed three months after delivery at IDIP’s Health Observatory did not meet the minimum recommended DHA percentage.

**Disclosures:** No conflict of interest to disclose.

### 4 DEVELOPMENT OF A MODEL OF CHILDHOOD ASTHMA IN MICE: EVALUATION OF CONVENTIONAL TREATMENTS AND A NEW IMMUNOMODULATOR

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**Background:** Atopic sensitization is important in development of childhood asthma. Ovalbumin (OVA) sensitization in adult mice is a well-studied model but there are few works in offspring. The development of new treatments is imperative, but it is necessary to place them in reference of usual treatments.

**Objective:** Describe the effect of OVA sensitization in mice of 3-4 weeks (corresponding to 1-3 human years), and to evaluate the effect of treatment with systemic and topic corticosteroid and a new immunomodulatory drug, immunotherapeutic oligodeoxynucleotide (IMT504).

**Methods:** Three weeks old mice received 1% OVA via intraperitoneal injection (IP) and intranasal delivery (IN) with. After this, animals were divided into 3 groups and treated with: Dexamethasone intramuscular (IM), Budesonide (BUD) via metered dose inhaler (MDI) with spacer, or subcutaneous IMT504. Each treatment included its corresponding placebo arm. Then, animals were challenged with OVA IN and sacrificed. In all animals, blood samples were obtained, bronchoalveolar lavage (BAL) was performed for protein and cytokines, and lungs were extracted to evaluate cytology and histopathology.

**Results:** OVA sensitization induced a type 2 T helper (Th2) response, with increase of proteins and transforming growth factor beta (TGF $\beta$ ) in BAL and increase of eosinophils and neutrophils in lung cytology. Dexamethasone and BUD decreases protein extravasation and TGF $\beta$  levels ( $p < 0.05$ ). The same thing happened with neutrophils and eosinophils in cytology, and scores of cellular infiltration, metaplasia, and fibrosis in histological sections. Treatment with IMT504 produced an improvement similar to steroids treatments.

**Conclusion:** This animal model and results would be of interest for the development of new therapeutic strategies.

**Disclosures:** No conflict of interest to disclose.

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**ASSOCIATION BETWEEN BODY FAT INCREASE AND VITAMIN D STATUS IN CHILEAN ADOLESCENTS OF MID-TO-LOW SOCIOECONOMIC LEVEL**

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**Background:** There is a high prevalence of overweight and obesity in children and adolescents. Increased body fat can result in nutritional deficiencies such as lower circulating levels of vitamin D (VitD). Low VitD status may lead to a wide range of chronic conditions, including osteoporosis and cardiometabolic disorders.**Objective:** To examine the association between increased body fat and VitD status in Chilean adolescents of mid-to-low socioeconomic level (SEL).**Methods:** Cross-sectional study in n = 166 Chilean adolescents aged 16-18 years. Total Fat Mass (TFM) by dual-energy X-ray absorptiometry and serum 25-hydroxyvitamin D (25-OH-D) were measured. TFM values >36% in females and >30% in males were considered excess TFM. Values of 25-OH-D <20 ng/mL were considered VitD deficiency and 25-OH-D values of 20-29 ng/mL were considered VitD insufficiency. Logistic regressions estimated the association between TFM and VitD status.**Results:** Participants were 16.8 (0.9 SD) years old, 53% were males, 52% had excess TFM and 32% had VitD insufficiency. No participants with VitD deficiency were found in the sample. VitD insufficiency was significantly higher in adolescents with excess TFM compared to adolescents with normal values of TFM (40.2% vs. 22.7%, respectively;  $P=0.016$ ). Adolescents with excess TFM had a significantly higher risk of VitD insufficiency compared to adolescents with normal values of TFM (OR: 2.28, 95% CI: 1.2-4.5).**Conclusion:** In this sample of adolescents, we found a negative association between fat mass and VitD status. Low VitD levels may be due to sequestration of VitD in body fat.**Disclosures:** Funded by a grant of the The National Fund for Scientific and Technological Development, Chile: FONDECYT 1030090 (Fernando Pizarro).

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**EFFECT OF CIGARETTE SMOKE ON AN IN VITRO MODEL OF ASTHMATIC RESPIRATORY EPITHELIUM: BUDESONIDE AND OXIDATIVE STRESS RESPONSE**Andrea Vanesa Dugour<sup>1</sup>, Angel Valdivieso<sup>2</sup>, Mariángela Clauzre<sup>2</sup>, Mariana Callelo<sup>1</sup>, Tomás Santa Coloma<sup>2</sup>, Juan Manuel Figueroa<sup>1</sup>.<sup>1</sup>Fundacion Pablo Cassará, Buenos Aires, Argentina; <sup>2</sup>Laboratorio de Biología Celular y Molecular-Instituto de Investigaciones Biomédicas, UCA-CONICET, Buenos Aires, Argentina.**Background:** It has been described that respiratory epithelium is key in inflammation and bronchial remodeling in asthma. Calu-3 cells (cultured human airway epithelial cell line) grown in monolayer at a liquid-air interface mimic the bronchial epithelium and, when stimulated with interleukin 1 beta (IL-1β) and hydrogen peroxide (H2O2), respond with an asthma-like cytokines profile.**Objective:** To evaluate in an in vitro model of asthmatic epithelium the effect of the addition of a cigarette smoke concentrate (CSC) on the release of IL-6, IL-8 ("inflammatory" cytokines), vascular endothelial growth factor (VEGF) and on cystic fibrosis transmembrane conductance regulator (CFTR) activity, to evaluate the response to Budesonide (BUD); and evaluate the involvement of oxidative stress.**Methods:** Calu-3 cells were cultured and divided into groups. A "control" group, and experimental groups in which IL-1β 50 ng/ml+H2O2 100 μM ("Asthma") or IL-1β 50 ng/ml +H2O2 100 μM+CSC 100 μg/ml ("asthma+cigarette") was added. After 4 hours the medium was replaced by medium only (control) or with BUD ("treated cells"). At 24 hours it was quantified in the supernatant IL-6, IL-8 and VEGF (enzyme-linked immunosorbent assay [ELISA]). The CFTR gene expression quantitative reverse transcription polymerase chain reaction (qRT-PCR) and oxidative stress levels (quantification of fluorescent reactive oxygen species [ROS]-sonda) were evaluated in cells. In order to better evaluate oxidative stress was repeated the protocol in other groups of cells, adding N-Acetyl cysteine (NAC= antioxidant) with each stimulus. Statistical analysis: Newman-Keuls multiple comparisons Test.**Results:** The "asthmatic" epithelium releases more IL-6 (6.9 times), IL 8 (5.3 times) and VEGF (121%) than healthy or control; the addition of CSC ("asthma+cigarette") significantly increased these cytokines (IL-6: 13.7 times and IL-8: 7.4 times, VEGF: 152%), along with a significant decline in the expression of CFTR mRNA, and a significant increase in ROS (35.22 ± 9.50%,  $p < 0.05$ ). BUD treatment decreased cytokines in both groups, persisting at the end higher levels of them in CSC exposed cells (IL-6: 3356 vs 1742 / IL-8: 89690 vs 59720, ng/ml). The addition of NAC blocked the increase of ROS and the increased release of cytokines by CSC, but did not prevent the decrease of CFTR.**Conclusion:** The exposure of the "asthmatic" epithelium to CSC induced oxidative stress and this was associated with an increase in the response of cytokines that does not respond to BUD but it can be avoided if oxidative stress is neutralized. CSC also originates a deficit of CFTR. The understanding of the mechanisms involved in these effects would be of interest for the development of new therapeutic strategies.**Disclosures:** No conflict of interest to disclose.

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**PROGNOSTIC FACTORS OF SEVERITY IN COMMUNITY-ACQUIRED PNEUMONIA COMPLICATED WITH PLEURAL EMPYEMA**Dolores Lovera Morán<sup>1</sup>, Soraya Araya Yampey<sup>1</sup>, Fernando Galeano Valdez<sup>1,2</sup>, Claudia Zárate<sup>1</sup>, Sara Amarilla Ortiz<sup>1</sup>, Nicolás González Perrota<sup>1</sup>, Celia Martínez de Cuellar<sup>1</sup>, Silvio Apodaca<sup>1</sup>, Antonio Arbo Sosa<sup>1,2</sup>.<sup>1</sup>Institute of Tropical Medicine (IMT), Asunción, Paraguay; <sup>2</sup>Universidad Nacional de Asunción, Asunción, Paraguay.**Background:** Pleural empyema (PE) represents one of the most serious complications of pneumonia.**Objective:** To identify prognostic factors of severity of pneumonia complicated with PE (PCPE) in pediatrics.**Methods:** Observational, retrospective study that included patients (PTS) <16 years old with diagnosis of PCPE, hospitalized in the IMT between 2006-2016. The patients were stratified into two groups depending of the requirement of hospitalization in intensive pediatric care unit (PICU). Demographic, clinical, laboratory and microbiological variables were analyzed.**Results:** One hundred and two patients met the inclusion criteria. The average age of the group was 51.7 ± 49.5 months; 48% were males. One etiologic agent was identified in 28% (28/102) of the cases, being *S. pneumoniae* and *S. aureus* the most frequent microorganisms isolated [57% (16/28) and 25% (7/28) of the cases, respectively]. Bacteremia was found in 7% (7/102) of the cases. Of the 16 strains of *S. pneumoniae* isolated, 67% were not included in the 10-valent pneumococcal conjugate vaccine (PCV10) versus 23% in the 13-valent pneumococcal conjugate vaccine (PCV 13) ( $p=0.12$ ). 51% of the patients (52/102) were admitted in PICU and 21.6% (22/102) of the patients required mechanical respiratory assistance. Mortality was 7% (7/102). Risk factors associated with severity were aged <2 years old ( $p:0.03$  OR 2.5, CI95% 1.1-5.9), presence of shock ( $p:0.03$  OR:4.3, CI95% 0.9-21.7), blood white cell count <5000/mm<sup>3</sup> ( $p:0.01$ ) and hemoglobin <8 gr/dl ( $p=0.03$  OR:3.08 CI95% 0.9-10.4). Moreover, blood white blood cell count >15000/mm<sup>3</sup> was protective ( $p < 0.05$  OR:0.4, CI95% 0.2-0.8).**Conclusion:** Mortality of PCPE is significant. They are important prognosis factors as the age and the host's response, such as the presence of shock, leucopenia and anemia. The presence of serotypes not included in the vaccines was identified.**Disclosures:** No conflict of interest to disclose.

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**OFF-LABEL DRUG PRESCRIPTION IN PEDIATRIC INTENSIVE CARE UNITS: MULTICENTER STUDY IN PERÚ, ARGENTINA AND CHILE**Justo Padilla Ygredd<sup>1</sup>, Nora Espiritu<sup>1</sup>, Emiliana Rizo-Patrón<sup>1</sup>, María Cristina Medina Pflucker<sup>1</sup>, José Tantaléan Da Fieno<sup>2</sup>, Fernando Ferrero<sup>3</sup>, Ricardo Pinto Muñoz<sup>4</sup>, Grimaldo Ramírez Cortez<sup>5</sup>, Raquel Huamani Ayala<sup>1</sup><sup>1</sup>Instituto Nacional Del Niño - San Borja, Lima, Perú <sup>2</sup>Instituto Nacional Del Niño - Breña, Lima, Perú <sup>3</sup>Hospital de Niños Pedro de Elizalde, Buenos Aires, Argentina <sup>4</sup>Hospital Roberto del Río, Santiago de Chile, Chile <sup>5</sup>Hospital Emergencias Pediátricas, Lima, Perú.**Background:** Off-label drug use involves prescribing medications in conditions that have not been approved by the regulatory agencies.**Objective:** To assess the off-label drug prescription frequency in Pediatric Intensive Care Units (PICUs).**Methods:** Cross-sectional study in 11 PICUs from Perú, Argentina and Chile. The prescriptions of one day from all hospitalized patients were registered. The attending physician was interviewed to establish each drug indication according to a clinical diagnosis or syndrome. Off-label drug use was defined according to the Pediatric Micromedex<sup>®</sup> Drug Reference (Truven Health Analytics; Ann Arbor, MI) electronic database. Two criteria for approved drug status were assessed: indication and patient's age.**Results:** We reviewed 819 prescriptions from 112 patients admitted in PICUs. 55.4% [IC95% 45.9-64.4] were male. The mean age was 2.3 years (SD = 3.4). We found 58.2% [IC95% 54.8-61.6] of off-label prescriptions for at least one criterion (age or indication), 42.8% [IC95% 39.4-46.2] for unapproved age, 30.7% [IC95% 27.6-33.9] for unapproved indication, and 15.1% [IC95% 12.8-17.8] for both criteria (age and indication). The drugs most frequently prescribed off-label were: spironolactone (9.4%), omeprazole (9.09%), lorazepam (8.1%) and albuterol (6.23%). 94.6% (n = 106) patients had at least one off-label prescription (unapproved age or indication). Of the prescribed drugs in each patient, 56.6% IC95% [52.2-61.1] were off-label.**Conclusion:** Off-label prescribing is very frequent among pediatric patients admitted in PICUs. Unapproved age is the most frequent reason of off-label use.**Disclosures:** No conflict of interest to disclose.

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**ASSESSMENT OF NUTRITIONAL STATUS IN CHILDREN WITH CEREBRAL PALSY: ANALYSIS OF CONCORDANCE BETWEEN DIFFERENT PATTERNS OF GROWTH**

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**Background:** Different criteria on the growth patterns for nutritional assessment (NA) in cerebral palsy (CP) children are used because of lack of standardization.**Objective:** To analyze NA agreement in CP children using charts specific for CP and for healthy ones.**Methods:** Children with CP of both genders, aged 2 to 19 years old, were included in a cross-sectional study. Five rehabilitation centers were sampled. The NA was made assessing the children with CP using both, the World Health Organization (WHO) charts for healthy children and Brooks' specific charts (Brooks J *et al.* Pediatrics 2011). The agreement was assessed with the Kappa Cohen test.**Results:** Seventy one subjects, 42 males (59%), aged 11.1 ± 4.9 years old, were studied according to Gross Motor Function Classification System (GMFCS). 4.2% had Level 1, 21.1% Level 2, 15.5% Level 3, 23.9% Level 4 and 35.2% Level 5. WHO charts established that only 21.1% of CP children had a normal nutritional status, 77.5% had deficit malnutrition and 1.4% had excessive malnutrition. However, CP-specific charts established that 74.6% were normal, 16.9% were malnourished by deficit and 8.5% by excess. The data agreement was evaluated for Height/Age,  $p > 95$  has  $\kappa=1$  (very good), but  $p < 5$   $\kappa=0$  (poor). For Weight/Age,  $p > 95$  has  $\kappa=1$  (very good) and  $p < 5$   $\kappa=0.21$  (fair). As for BMI/Age,  $p > 95$ , has  $\kappa=0.32$  (fair),  $p 95-90$   $\kappa=0.66$  (good),  $p 10-5$   $\kappa=0.27$  (fair) and  $p < 5$   $\kappa=0.24$  (fair).

# Abstracts

**Conclusion:** Charts for healthy children tend to classify children with CP short and thin when in fact they have a normal growth for their condition. Nevertheless, they show more agreement when detecting overweight or obesity.

**Disclosures:** No conflict of interest to disclose.

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## ASSOCIATION BETWEEN EARLY RAPID WEIGHT GAIN, DURATION OF EXCLUSIVE BREASTFEEDING AND MATERNAL FACTORS WITH EXCESS MALNUTRITION AT 5 YEARS OF AGE

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**Background:** The prevalence of malnutrition by excess (ME) and its complications are an important public health problem. Several factors influencing this condition have been described, such as early rapid weight gain (ERWG), less than 6 months of exclusive breastfeeding (EBF) and maternal factors. We hypothesized that Infants EBF for <6 months and with ERWG during the first year of life are at increased risk of ME at 5 years than those EBF >6 months and with adequate weight gain.

**Objective:** To analyze the association between linear growth during the first year of life, EBF and maternal factors with ME at 5 years of age.

**Methods:** We analyzed 272 healthy 5 years old children. The parents were contacted by telephone, a checkup appointment was scheduled at Primary Health Care (PHC), weight and height were measured. The retrospective data was obtained from the patients' medical records. The variables analyzed were: ERWG, duration of EBF, type of delivery, gestational diabetes (GD) and maternal education level.

**Results:** At 5 years 36.03% of the children presented ME, of which 18.38% were obese. There was no association between EBF <6 months and ME at 5 years. Children with ERWG in the 0-12 months range are 3.11 times more likely to present ME at 5 years ( $p=0.002$ ). There was no difference between the maternal factors in children with ME versus eutrophic children.

**Conclusion:** Infants with ERWG during the first year of life are 3 times more likely to present ME at 5 years.

**Disclosures:** No conflict of interest to disclose.

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## INFLUENCE OF CLINICAL, PHARMACOLOGICAL AND GENETIC FACTORS ON ACUTE REJECTION AND TACROLIMUS-RELATED ADVERSE EVENTS IN PEDIATRIC LIVER TRANSPLANT PATIENTS

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**Background:** The management of immunosuppression in pediatric transplantation represents a challenge due to the difficulties in finding the balance between efficacy and toxicity. Besides surgical and therapeutic advances in pediatric liver transplantation, acute rejection (AR) and tacrolimus-induced adverse events (AE) occur, increasing morbidity and mortality.

**Objective:** The aim of this study was to identify peritransplant predictors of AR and factors related to tacrolimus-AE in pediatric liver transplant patients.

**Method:** We retrospectively studied patients who received their first liver transplantation in 2010-2012 and survived more than 1 month post-transplantation. Peritransplant variables included demographic, clinical parameters, genomic (CYP3A5 donor and recipients gene polymorphism) and tacrolimus trough concentrations over a 2-year follow-up. Variability in tacrolimus concentration was calculated using tortuosity. Multivariate survival analysis using Cox's regression models was performed, and hazard ratios (HR) calculated.

**Results:** In total, 72 patients were studied. Forty-seven patients experienced at least one AR. The final Cox model retained variability in tacrolimus concentration (HR 1.80, 95%CI, 1.01-3.22,  $p<0.05$ ), and steroid administration in maintenance doses (HR, 0.56, 95%CI, 0.31-0.99,  $p<0.05$ ). Forty-six patients experienced at least one AE including hypomagnesemia, nephrotoxicity, and tremor as first event. Multivariate analysis showed that tacrolimus concentration values in the 7 to 10-day window before the event (HR, 1.25, 95%CI, 1.21-1.39,  $p<0.0001$ ) and CYP3A5 expressers recipients (HR, 2.05, 95%CI, 1.03-4.06,  $p<0.05$ ) were independent predictors of AE.

**Conclusion:** This is the first study in a large cohort of Latin-American pediatric patients which identifies protective and risk factors of AR and AE. These results may contribute to design programs to control their development. Prospective studies are important to validate these results.

**Disclosures:** No conflict of interest to disclose.

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## PREDICTING MORTALITY IN A BURN PEDIATRIC INTENSIVE CARE UNIT FROM A SPECIALIZED HEALTH CENTER IN PERÚ

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**Background:** The scores currently used to predict mortality in burn patients haven't been properly validated in children of developing countries. This situation introduces a problem of validity and lack of reliability.

**Objective:** To validate and assess the discriminative performance of two mortality prediction scores in the Burn Pediatric Intensive Care Unit (BPICU) from the Instituto Nacional del Niño San Borja, Lima-Perú.

**Methods:** Retrospective study of patients admitted to the BPICU from 2014 to 2017. We evaluated two predictive scores based on admission data: Belgian Outcome in Burn Injury score (BOBI) and pediatric Baux score (P-Baux). We assessed the utility and the goodness of fit (gof) for each model by receiver operating characteristic analysis (area under the curve-AUC) and Hosmer-Lemeshow test respectively.

**Results:** Three hundred and six patients were admitted in the burn PICU during the study period. We excluded 11 subjects (9 because of electric burn and 2 because of post-surgery state due to burn sequelae). The mortality was 8.5%. Median age was 3 years (interquartile range (IQR): 1.8-5.6), median total burned surface area (TBSA) was 31.1% (IQR: 24-42). 62.7% were male. 58.3% came from provinces other than Lima. The AUC for the P-Baux model was 0.75 [IC 95% 0.64, 0.85] and for the BOBI model was 0.76 [IC95% 0.62, 0.88]. P-Baux model had a better fit in discriminating mortality according to the gof test ( $p=0.2407$ ) in contrast to the BOBI model ( $p=0.0986$ ).

**Conclusion:** P-Baux and BOBI scores are feasible and simple to calculate. This study showed moderate to low discriminative power using either prediction scores.

**Disclosures:** No conflict of interest to disclose.

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## NEONATAL HIGHER C-REACTIVE PROTEIN LEVELS ARE ASSOCIATED WITH LOWER WEIGHT AND HEIGHT AT 12-MONTHS CORRECTED AGE IN VERY PRETERM INFANTS

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**Background:** An association between neonatal systemic inflammation (SI) and postnatal growth has not been reported. We hypothesized that infants exposed to SI would show poor postnatal growth.

**Objective:** To determine whether a neonatal marker of SI was associated with poor postnatal growth among very preterm infants (VPI) at 12 months corrected age (CE).

**Methods:** We studied singleton, appropriate gestational age (AGA) infants,  $\leq 32$  weeks' gestational age (GA) and birth weight (BW)  $\leq 1.5$  kg without congenital malformations, enrolled since 2006-2016. Weight, length and head circumference were recorded at birth and at 12 months CE. Standardized Z-scores for weight (WZ), length (LZ) and head circumference (HCZ) at 12 months CE were calculated and we estimated their association with mean C-reactive protein (CRP) sampled on days 1-3-7-14-28 of life. Multiple linear regression and stratified analysis were performed.

**Results:** Ninety six infants, 38 (38.8%) males, with  $29.2 \pm 2.5$  weeks GA,  $1.155 \pm 0.312$  Kg BW,  $-0.42 \pm 0.79$  WZ,  $0.51 \pm 0.78$  LZ and  $0.43 \pm 0.78$  HCZ at birth were studied. The mean neonatal CRP was  $2.5 \pm 3.8$  mg/L. Growth failure was present in 15 (15.6%) infants at 12 months CE. Decreases in WZ and LW ( $\beta -0.052 \pm 0.023$ ;  $p 0.028$  and  $\beta -0.074 \pm 0.024$ ;  $p 0.003$  respectively) were significantly associated with higher mean CRP. HCZ was not significantly associated with mean CRP levels ( $\beta 0.009 \pm 0.021$ ;  $p 0.680$ ). The association remained significant in infants with prenatal corticosteroids exposure and neonatal complications (bronchopulmonary dysplasia, neonatal sepsis and necrotizing enterocolitis) from the non-exposed groups.

**Conclusions:** SI is associated with poor postnatal growth. Serial CRP may be useful marker for identifying infants at risk for postnatal growth failure.

**Disclosures:** No conflict of interest to disclose.

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## OXYGEN SATURATION MEASURED BY PULSE OXYMETRY IN HEALTHY TERM NEWBORNS AT HIGH ALTITUDE (3600 m)

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**Background:** Assessing peripheral oxygen saturation is important for monitoring adaptation of the newborn. Oxygen saturation at high altitude differs from sea level.

**Objective:** To determine pulse oximetry values at 1, 2, 3, 4, 5, and 10 minutes after birth in healthy term newborns.

**Methods:** This observational study was performed from November to December 2016. Oxygen saturation was measured at 1, 2, 3, 4, 5, and 10 minutes after birth, in all consecutive term healthy newborns at Hospital de la Mujer, La Paz, Bolivia (3600 meters), born both by vaginal delivery or elective cesarean section.

**Results:** One hundred and twenty eight newborns were included, 64 females and 64 male, 48 were born by caesarean section and 80 by vaginal delivery. The average oxygen saturation at the first minute was 72%, at the second minute 88%, at the third minute 90%, at the fourth minute 92%, at the fifth minute 80% and at the tenth minute 90%, with higher values in the first five minutes in patients born by caesarean section.

**Conclusions:** The saturation of oxygen at the height of the City of La Paz on average is lower than at sea level, with higher values in newborns by cesarean section.

**Disclosures:** No conflict of interest to disclose.

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## EVOLUTION PREDICTORS IN CONGENITAL DIAPHRAGMATIC HERNIA ON THE FIRST DAY OF LIFE

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**Background:** Congenital diaphragmatic hernia (CDH) occurs in 1/5,000 live births. It has high mortality by the presence of pulmonary hypoplasia.

**Objective:** To investigate the prognostic value for poor evolution of clinical, echocardiographic and /or biochemical predictors in CDH patients, during the first day of life.

**Methods:** Retrospective cohort study. In CDH patients on the first day, consecutive sampling. Patients admitted older than 24 hours of life and without N-terminal pro b-type natriuretic peptide (NTproBNP) measurement were excluded. The following variables were recorded: gender, gestational age (GA), hernia's side, birth place, mechanical ventilation (MV) modality, oxygenation index (OI), echocardiogram, nitric oxide requirement (INO), Score for Neonatal Acute Physiology with Perinatal Extension-II (SNAPPE II), pressure of arterial carbon dioxide (paCO<sub>2</sub>) value, NTproBNP measurement. The outcome was Extracorporeal Membrane Oxygenation (ECMO) requirement and death. According to the clinical evolution, two groups were compared: Good outcome (GO) or Poor Outcome (PO), PO was defined as ECMO requirements and/or death.

**Results:** Thirty one patients with CDH were the study population, 21(68%) had GO and 10 (32%) had PO. Higher OI, SNAPPE II or requirement of high frequency ventilation (HFV) showed a worse evolution; the degree of pulmonary hypertension according to echocardiography, the value of paCO<sub>2</sub> and the NT pro BNP measurement, did not show statistically differences between both groups. OI value showed good discrimination in the receiver operating characteristic (ROC) curve (area under the curve [AUC] of 0.84 (95% IC 0.65-1), cutoff point  $\geq 21$ , (sensitivity: 70% specificity: 100% LHR+ 12 LHR -0.3). OI  $\geq 21$  increased risk of PO (RR 8 -IC 95%: 2,7-23). SNAPPE II value, also showed good discrimination in the ROC curve (AUC of 0.80 (95% IC 0.58-1), cutoff point  $\geq 37$  (S: 80% E: 95% LHR+16.8 LHR- 0.21). Score  $\geq 37$ , was more frequent in PO (RR 9.77 -95% CI: 2.55-37)

**Conclusion:** In our study, clinical variables on the first day of life in CDH patients, had a greater predictive capacity for poor outcome than biochemical or echocardiographic markers (NTproBNP measurements or degree of pulmonary hypoplasia).

**Disclosures:** No conflict of interest to disclose.

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#### EXHALED NITRIC OXIDE FRACTION IN ASTHMATIC CHILDREN: RELATIONSHIP WITH SPIROMETRIC PATTERNS AND SPIROMETRIC RESPONSE TO EXERCISE

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**Background:** Respiratory epithelium produces nitric oxide and this increase in eosinophilic inflammation. Exhaled nitric oxide (FeNO) correlate with eosinophilic inflammation in bronchial biopsies, bronchoalveolar lavage (BAL), and induced sputum. Spirometry is an important tool for diagnosing and monitoring asthma. Changes induced by bronchodilators or exercise are indicators of bronchial status.

**Objective:** Estimate the relationship between FeNO and: (1) basal and post bronchodilator spirometry; (2) the response to exercise test.

**Methods:** Population: (1) children with moderate asthma, and (2) a subgroup of asthmatic children, treated with inhaled corticosteroids (ICS), with exercise-related symptoms. Determinations: (1) Measurement of FeNO (Bedfont NObreath<sup>®</sup>) (Bedfont Scientific Ltd., Kent, UK) and of basal and post-bronchodilator spirometry (according to the American Thoracic Society and European Respiratory Society [ATS/ERS] standards); (2) FeNO followed by exercise challenge test on treadmill (ATS/ERS standards).

**Results:** (1) 229 children (56% M), mean age 11 years (6-19). FeNO  $\geq 30$  ppb was associated with a positive response to bronchodilator in FEF25-75, (Mann Whitney Test p0.01; in a Post hoc analysis, we separately evaluate patients with and without inhaled steroid therapy: in children without steroids the difference was also significant comparing forced expiratory volume measured during the first second (FEV1)  $\geq 80$  and FEV1  $\leq 80$  (0.049).) (2) 45 children (51% M), age 11 to (8-18) perform exercise test: 16 showed exercise-induced bronchoconstriction (EIB); FeNO  $> 30$  ppb was associated with positive test (sensitivity 93.3%, specificity 58%).

**Conclusion:** Elevated FeNO was associated with a positive response to bronchodilator in distal flows and with bronchial reactivity to exercise.

**Disclosures:** No conflict of interest to disclose.

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