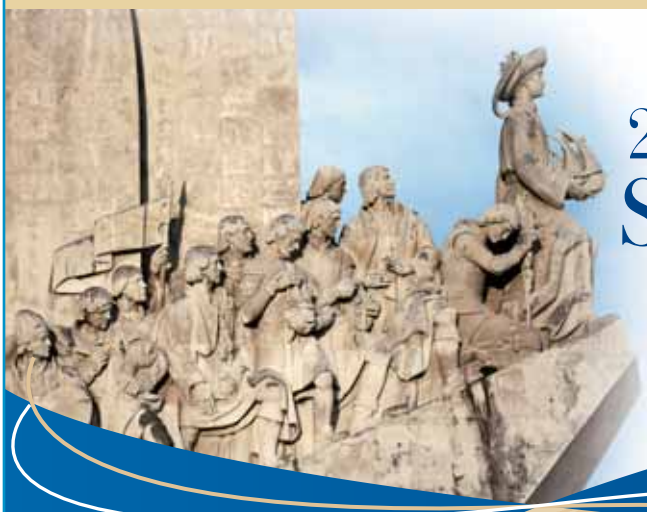
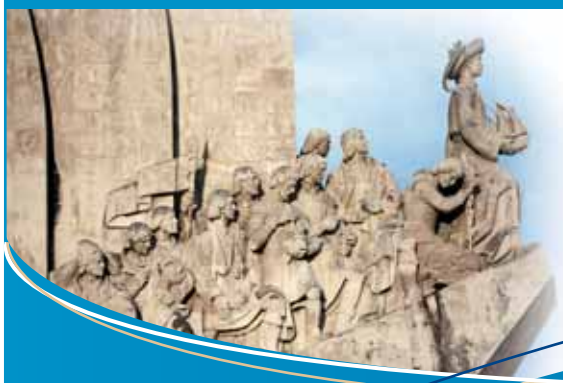
Lisbon | Portugal | June 1st-2nd, 2012



27th International Workshop on Surfactant Replacement

PROGRAMME



27th International Workshop on Surfactant Replacement

Invited Speakers

Kasja Bohlin (Stockholm, Sweden)
Manuel R. Carrapato (Porto, Portugal)
Peter Dargaville (Hobart, Australia)
Gian Carlo Di Renzo (Perugia, Italy)
Aaron Hamvas (St. Louis, USA)
Richard Martin (Cleveland, USA)
Jane Pillow (Perth, Australia)
Ola D. Saugstad (Oslo, Norway)
Kris Sekar (Oklahoma City, USA)
Ben Stenson (Edinburgh, UK)

Scientific Committee

Manuel R. Carrapato (Porto, Portugal)
Tore Curstedt (Stockholm, Sweden)
Henry L. Halliday (Belfast, UK)
Mikko Hallman (Oulu, Finland)
Ola D. Saugstad (Oslo, Norway)
Christian P. Speer (Würzburg, Germany)

Chairpersons

Sture Andersson (Helsinki, Finland)
Elena Baybarina (Moscow, Russia)
Jatinder Bhatia (Augusta, USA)
Tore Curstedt (Stockholm, Sweden)
Henry L. Halliday (Belfast, UK)
Mikko Hallman (Oulu, Finland)
Dominique Haumont (Brussels, Belgium)
Boris Kramer (Maastricht, The Netherlands)
Maria T. Neto (Lisbon, Portugal)
Eren Özek (Istanbul, Turkey)
Almerinda Pereira (Porto, Portugal)
Rangasamy Ramanathan (Los Angeles, USA)
Eric Shinwell (Rehovot, Israel)
Christian P. Speer (Würzburg, Germany)
Ola D. Saugstad (Oslo, Norway)
Bo Sun (Shanghai, China)
David Sweet (Belfast, UK)
Adolf Valls-i-Soler (Bilbao, Spain)
Henrik Verder (Copenhagen, Denmark)

Organizing Committee

Chiesi Group

Congress Venue

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Lisbon | Portugal | June 1st-2nd, 2012

Dear Colleagues and Friends,

Welcome to Lisbon for the 27th Workshop on Surfactant Replacement.

Peri (neo) natal mortality and morbidity has been greatly reduced over the last couple of decades, at least in the most affluent parts of the world and, surfactant replacement and treatment has played a significant role in this context. This year`s presentations will, no doubt, bring further advances and news on surfactant research and applications, from the bench into clinical practice. We are, particularly, grateful to all of you for sharing your knowledge and experience with us, to the benefit of those for whom we really care, the vulnerable neonate, often in the limit of periviability.

In addition to the scientific exchanges we hope you will enjoy the Portuguese hospitality and that this may be an opportunity to start new friendships whilst renewing old ones.

We thank Chiesi and Takeda for their continued support and the editors of Neonatology for publishing the proceedings of the Workshop.

Manuel R. Carrapato

Friday, June 1st

08.15 - 08.30 **Welcome address**
Manuel R. Carrapato (Porto, Portugal)

Chairpersons: **Christian P. Speer (Würzburg, Germany)**
Henry L. Halliday (Belfast, UK)

08.30 - 09.10 **4th Bengt Robertson Lecture**

Oxygenation of the newborn: a molecular approach
Ola D. Saugstad (Oslo, Norway)

INVITED LECTURE
09.10 - 09.50 **Infection and preterm birth**
Gian Carlo Di Renzo (Perugia, Italy)

ORAL PRESENTATIONS
09.50 - 10.05 Molecular basis of sustained inflammation after neonatal sepsis: a matter of life and death?
T. Orlikowsky (Aachen, Germany)

10.05 - 10.20 Synergistic effects and molecular mechanisms of caffeine and glucocorticoids on surfactant protein (SP-B) expression
I. Bersani, M. Fehrholz, S. Kunzmann, C.P. Speer (Würzburg, Germany)

10.20 - 10.50 COFFEE BREAK AND POSTER VIEWING

Chairpersons: **Eric Shinwell (Rehovot, Israel),**
Bo Sun (Shanghai, China)

INVITED LECTURE
10.50 - 11.30 **Innovation in surfactant therapy**
Peter A. Dargaville (Hobart, Australia)

ORAL PRESENTATIONS

11.30 - 11.45 **Prediction of RDS and selective treatment with Curosurf®**
H. Verder, F. Ebbesen, J. Fenger Grøn, T.B. Henriksen for the Danish-Swedish Multicenter Study Group on Surfactant Research (Holbaek, Denmark)

11.45 - 12.00 **Synthetic surfactant with SP-B and SP-C analogs is more resistant to inactivation than poractant alfa in vivo**
M. Seehase, J. Collins, E. Kuypers, R.K. Jellema, R. Garzia, R. Razzetti, B.W. Kramer (Maastricht, The Netherlands)

12.00 - 12.15 **Intratracheal surfactant instillation via a thin diameter tube in spontaneously breathing infants – on the way to clinical practice in Germany?**
E. Herting, A. Kribs, B. Roth, R. Laux, T. Hoehn, C. Wieg, E. Kattner, S. Avenarius, A. Wense, M. Vochem, P. Groneck, U. Weller, J. Möller, C. Härtel, W. Göpel and members of the German Neonatal Network (Lübeck, Germany)

12.15 - 12.30 **Natural versus synthetic surfactant in an experimental model of meconium aspiration syndrome**
B. Salvesen, T. Curstedt, T.E. Mollnes, O.D. Saugstad (Oslo, Norway)

12.30 - 14.00 LUNCH AND POSTER VIEWING

Chairpersons: Henrik Verder (Copenhagen, Denmark)
Boris Kramer (Maastricht, The Netherlands)

14.00 - 15.00 **POSTER PRESENTATIONS**

Poster 1 **Is there any effect of inhaled salbutamol before surfactant therapy?**
H.T. Çelik, M. Yurdakök, A. Korkmaz, Ş. Yiğit (Ankara, Turkey)

Poster 2 **Plasminogen activator inhibitor-1 gene polymorphism in retinopathy of prematurity**
D. Armangil, I. Akalin, M. Yurdakök, B. Saygin, H. Erdöl, Y. Aslan (Trabzon, Turkey)

Poster 3 **Assessment of lung ventilation in infants with respiratory distress syndrome before and after surfactant administration using electrical impedance tomography**
I. Chatziioannidis, T. Samaras, P. Karagianni, G. Mitsiakos, P. Malindretos, N. Nikolaidis (Thessaloniki, Greece)

Poster 4 **Addition of steroids to modified porcine surfactant reduces chemotaxis and surface activity**
C. Keldermann, G. Walter, E. Herting, G. Stichtenoth (Lübeck, Germany)

Poster 5 **Perfusion index variability before and after surfactant treatment in RDS**
N.N. Karadağ, D. Dilli, A. Zenciroğlu, A. Dursun, B.S. Karagöl, N. Okumuş (Ankara, Turkey)

Friday, June 1st

Poster 6 **Hypothermia during transportation is critically important for newborns with RDS**
A. Dursun, A. Zenciroğlu, N.N. Karadağ, P. Asan, N. Hakan, B.S. Karagöl, A. Kundak, N. Okumuş, D. Dilli (Ankara, Turkey)

Poster 7 **Comparison of the two treatment regimens of natural surfactant preparations in respiratory distress syndrome; experience from Turkey**
S. Özge, B. Deya, G. Tuğba, O. Fahri, K. Güner (Istanbul, Turkey)

Poster 8 **Serum IL-6, vascular endothelial growth factor, and S100B protein levels are increased in intrauterine growth restricted newborns**
B. Strzalko Głoskowska, M. Kmiecik, P. Krajewski, A. Chudzik, M. Pokrzywnicka, M. Kwiatkowska, A. Karowicz, K. Wyka, J. Chlapiński, M. Kamiński (Lodz, Poland)

Chairpersons: **Mikko Hallman (Oulu, Finland)**
Adolf Valls-i-Soler (Bilbao, Spain)

INVITED LECTURE

15.00 - 15.40 **Non-invasive surfactant instillation**
Jane Pillow (Perth, Australia)

ORAL PRESENTATIONS

15.40 - 15.55 Circulating C-terminal pro-endothelin-1 is related to pulmonary morbidity of newborn infants
S. Wellmann, J. Benzing, O. Stabile, G. Szinnai, N.G. Morgenthaler, S.M. Schulzke, C. Bührer (Berlin, Germany)

15.55 - 16.10 Sequential surfactant protein D levels in endotracheal aspirates from intubated preterm infants
R. Mackay, D. Todd, J.P. Townsend, T. Postle, H. Clark (Southampton, UK)

16.10 - 16.25 Regional cerebral blood flow (RCBF) distribution after aerolisolized or instilled Curosurf® in preterm lambs with RDS
X. Murgia, A. Valls-i-Soler, V. Mielgo, E. Ruiz-del-Yerro, C. Rey-Santano (Bilbao, Spain)

Chairpersons: **Ola D. Saugstad (Oslo, Norway)**
Eren Özek (Istanbul, Turkey)

INVITED LECTURE

16.25 - 17.05 **Mechanism of injury to the preterm lung and airway: implications for long term pulmonary outcome**
Richard Martin (Cleveland, USA)

ORAL PRESENTATIONS

17.05 - 17.20 Colchisine and medical ozone therapy as anti-inflammatory and anti-oxidant in prevention and treatment of hyperoxic lung injury in neonatal rats
Ozdemir R, Yurttutan S, Talim B, Uysal B, Erdeve O, Oguz SS, Dilmen U. (Ankara, Turkey)

17.20 - 17.35 Recombinant human keratinocyte growth factor (rhKGF) reverses hyperoxia induced lung injury
K. Schaal, M. Raith, H. Fehrenbach, C. F. Poets, W. Bernhard (Tübingen, Germany)

Saturday, June 2nd

Chairpersons: Tore Curstedt (Stockholm, Sweden)
Sture Andersson (Helsinki, Finland)

INVITED LECTURE

08.30 - 09.10 **Current technology in diagnosis of developmentally related lung disorders**
Aaron Hamvas (St Louis, USA)

ORAL PRESENTATIONS

09.10 - 09.25 Characterising the metabolism of therapeutic exogenous surfactant (Curosurf®) in preterm infants using a stable isotope labelled substrate
K.C.W. Goss, V.M. Goss, J.P. Townsend, R. Gunda, G. Koster, H.W. Clark, A.D. Postle (Southampton, UK)

09.25 - 09.40 In vitro surface film formation by natural and commercial surfactants: Role of surfactant protein B
O. Danhaive, C. Chapin, P.E. Cogo, P.L. Ballard (San Francisco, USA)

09.40 - 09.55 Pulmonary angiogenesis: genetic association with bronchopulmonary dysplasia
M. Mahlman, J. Huusko, M. Hallman, for the Gen-BPD Study Group (Oulu, Finland)

09.55 - 10.25 COFFEE BREAK AND POSTER VIEWING

Chairperson: Dominique Haumont (Brussels, Belgium)

INVITED LECTURE

10.25 - 11.05 **Surfactant – when and how**
Kajsa Bohlin (Stockholm, Sweden)

ORAL PRESENTATIONS

11.05 - 11.20 Premature adult lung study (PALS): Respiratory outcomes and impact of neonatal surfactant in adult survivors of bronchopulmonary dysplasia
A. Gough, M. Linden, D. Spence, C. Patterson, H.L. Halliday, L. McGarvey (Belfast, UK)

11.20 - 11.35 Hypocarbia incidence and outcomes in preterm babies with RDS on SIMV
S. Budhiraja, C. Gupta, D.G. Sweet (Belfast, UK)

11.35 - 11.50 Feasibility of early and faster administration of surfactant in spontaneous breathing (TAKE CARE) and its comparison with INSURE (intubation, surfactant, extubation) procedure
H.G. Kanmaz, B. Mutlu, O. Erdeve, S.S. Oguz, F.E. Canpolat, N. Uras, U. Dilmen (Ankara, Turkey)

Chairpersons: Elena Baybarina (Moscow, Russia)
David Sweet (Belfast, UK)

11.50 - 12.20 **POSTERS WITH SHORT PRESENTATIONS**

Poster 9 **Oral vs. intravenous ibuprofen for patent ductus arteriosus closure: a randomised controlled trial in extremely low birthweight infants**
O. Erdeve, S. Yurttutan, N. Altug, R. Ozdemir, T. Gokmen, U. Dilmen, S.S. Oguz, N. Uras (Ankara, Turkey)

Poster 10 **Favourable long-term outcome of a patient with ABCA3 gene mutations and severe neonatal lung disease**
D. Morgillo, M. Fontana, P. Eng, T.M. Berger (Lucerne, Switzerland)

Poster 11 **Surfactant deficiency in severe bronchiolitis**
F. Hartmann, H.H. Fiori, P.C.R. Garcia, J.P. Piva, R.S. da Silva, R. M. Fiori (Porto Alegre, Brazil)

Poster 12 **Use of different modes of CPAP with variable flow in preterm infants with VLBW and ELBW after extubation: a multicenter randomized clinical study**
A. Mostovoy, K. Romanenko, A. Averin, Y. Staroselskiy, M. Starkova, Y. Novitskaya (St. Petersburg, Russia)

Poster 13 **Results of the new NCPAP protocol implementation**
E. Baybarina, A. Antonov, O. Ionov, O. Borisevich (Moscow, Russia)

Poster 14 **Work of breathing during mechanical ventilation in preterm infants**
G. Dimitriou, A. Vervenioti, S. Tzifas, S. Mantagos (Patras, Greece)

12.20 - 13.30 LUNCH AND POSTER VIEWING

Chairpersons: Elena Baybarina (Moscow, Russia)
David Sweet (Belfast, UK)

13.30 - 14.30 **POSTER PRESENTATIONS**

Poster 15 **Early neonatal outcomes after volume-guaranteed synchronized intermittent mandatory ventilation combined with poractant alfa in premature infants with respiratory distress syndrome**
S. Guven, S. Bozdag, H. Saner, M. Cetinkaya, A.S. Yazar, M. Erguven (Istanbul, Turkey)

Poster 16 **Lipid surfactant kinetics of intubated children**
V.M. Goss VM, G. Koster G, J.P. Townsend, K.C. Goss, M.J. Marsh, I. Macintosh, V.J. Pappachan, A.D. Postle (Southampton, UK)

Poster 17 **Minimally invasive postnatal respiratory management (high-flow CPAP and surfactant treatment while breathing spontaneously) and its impact on mortality, morbidity and neurodevelopmental outcome of preterm infants between 23^{+0} and 27^{+6} weeks of gestation**
K. Klebermass-Schrehof, M. Wald, J. Schwindt, N. Haiden, M. Hayde, A. Pollak, A. Berger (Vienna, Austria)

Poster 18 **Long term effect of cord blood and gastric aspirate cytokines on lung function**
I. Štucin Gantar, M. Praprotnik, J. Babnik, B. Wraber, L. Kornhauser Cerar (Ljubljana, Slovenia)

Poster 19 **Our experience of the INSURE method in neonates born before 32 weeks of gestation**
Chudzik, B. Strzałko-Głoskowska, M. Kmiecik, M. Pokrzywnicka, M. Kwiatkowska, P. Krajewski (Lodz, Poland)

Poster 20 **Does intrauterine inflammation increase the risk for developmental delay in very preterm infants?**
J. Babnik, V. Globevnik Velikonja, I. Štucin Gantar (Ljubljana, Slovenia)

Poster 21 **Documentation of common side effects occurring during galenic caffeine citrate use**
J. Arand (Tübingen, Germany)

Poster 22 **Uneven roads: diluted surfactant for difficult-to-ventilate babies**
D. Mezzetti, A. Fantauzzi, M. Cofini, M. Radicioni (Perugia, Italy)

POSTCONFERENCE WORKSHOP

Chairpersons: Bo Sun (Shanghai, China)
Maria T. Neto (Lisbon, Portugal)

14.30 - 15.00 The Portuguese Experience
Manuel R. Carrapato (Porto, Portugal)

15.00 - 15.10 Discussion

15.10 - 15.40 Reducing nosocomial infections in the NICU
Kris Sekar (Oklahoma City, USA)

15.40 - 15.50 Discussion

15.50 - 16.20 COFFEE BREAK

Chairpersons: Jatinder Bhatia (Augusta, USA)
Rangasamy Ramanathan (Los Angeles, USA)

16.20 - 16.50 Optimal oxygen targeting
Ben Stenson (Edinburgh, UK)

16.50 - 17.00 Discussion

17.00 - 17.45 Round table discussion
A. Pereira, B. Stenson, K. Sekar, J. Bhatia, R. Ramanathan

17.45 - 18.00 Closing remarks and invitation to Helsinki

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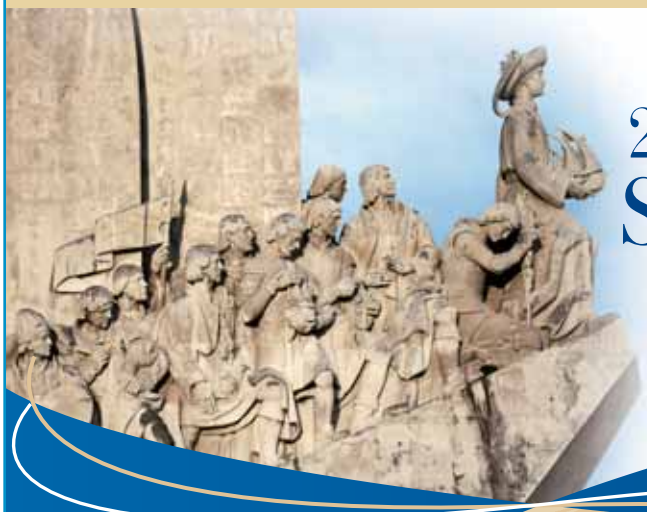

27th International Workshop on Surfactant Replacement

POSTERS

Poster 1

IS THERE ANY EFFECT OF INHALED SALBUTAMOL BEFORE SURFACTANT THERAPY?

H.T. Çelik, M. Yurdakök, A. Korkmaz, Ş. Yiğit (Ankara, Turkey)

Background: β-2 adrenergic receptors are present in alveolar type II cells. Previously, benefical effects of inhaled salbutamol on respiratory outcomes were shown in preterm infants with transient tachypnea of the newborn. **Objective**: We hypothesized that inhaled salbutamol would increase the effects of surfactant on oxygenation in preterm infants with respiratory distress syndrome (RDS).

Methods: Inhaled salbutamol (0.15 mg/kg) or normal saline solution (0.30 ml/kg) was administered as a single dose by micropump nebulizer 10 minutes before the first dose of surfactant (Poractant alfa) in 40 infants with gestational ages ranging from 26 to 36 weeks. The effects of salbutamol therapy were evaluated by determining duration of respiratory support, the number of doses of surfactant, and respiratory rate, heart rate, fraction of inspired oxygen, partial pressure of arterial oxygen before and after salbutamol nebulization.

Results:

	Salbutamol Group (n=20)	Control Group (n=20)	*P* value
Gender (F/M)	13/7	9/11	.204
Gestational age (weeks ± SD)	30.4±2.5	30.5±1.7	.883
Birth weight (g ± SD)	1378±499	1356±379	.876
Antenatal steroid (n, %)	15 (75.0)	18 (90.0)	.358
Apgar score (5th min)*	7.5 (5-10)	7.0 (6-9)	.192
Respiratory rate (breaths/min)			
Before	60.9±9.5	64.5±8.5	.242
After (4th hour)	58.9±6.5	59.6±3.2	.667
P value	.116	.003	.129
PaO_2 (mmHg)			
Before	52.7±13.6	52.8±21.6	.640
After (4th hour)	60.1±13.4	52.8±21.6	.242
P value	.071	.414	.577
Duration of respiratory support			
MV (h)*	24 (0-600)	48 (0-480)	.383
CPAP (h)*	45.5 (6-840)	44.0 (0-262)	.355
Oxygen support (h)*	24 (19-744)	24 (0-596)	.165

*Median; MV, mechanical ventilation; CPAP, continuous positive airway pressure

Conclusion: In this study, no significant effect of the inhaled salbutamol treatment on surfactant therapy in preterm infants with RDS was detected.

Poster 2

PLASMINOGEN ACTIVATOR INHIBITOR-1 GENE POLYMORPHISM IN RETINOPATHY OF PREMATURITY

Armangil, I. Akalın, M. Yurdakök, B. Saygın, H. Erdöl, Y. Aslan (Trabzon, Turkey)

Background: Retinopathy of prematurity (ROP) is a proliferative vascular disorder that is the commonest cause of visual impairment in preterm neonates.
Objectives: We investigated the novel emerging gene polymorphism of plasminogen activator inhibitor (PAI-1) 4G/5G as an important risk factor of tissue remodeling, fibrosis and angiogenesis contributing to the pathogenesis of ROP.
Methods: Seventy-three neonates with ROP and 101 controls were enrolled in the study. Mean gestational ages were 29.4±0.8 weeks and 30.0±1.4 weeks, mean birth weights were 1322±431 g and 1414±313 g, respectively. Genotyping was analyzed using real time PCR.
Results: We found no significant differences in allele frequency of the PAI-1 genes between control group and neonates with ROP (p=0.540 and p=0.527). The proportion of 4G/4G, 4G/5G and 5G/5G genotypes did not differ statistically between the ROP and control groups (p>0.05). Having PAI-1 4G/4G genotype polymorphism seems to decrease the risk of ROP (OR =0.702; 95% CI: 0.300-1.639) less than PAI-1 4G/5G polymorphisms (OR =1.064; 95% CI: 0.469-2.410).
Conclusion: This study showed that PAI-1 4G/5G genotype which is known as a risk factor for angiogenesis is not a predisposing factor for development of ROP. To our knowledge, this study is the first report investigating the association of PAI-1 gene polymorphisms and retinal angiogenesis and points towards a decreased risk of ROP in 4G homozygous neonates.

Poster 3

ASSESSMENT OF LUNG VENTILATION IN INFANTS WITH RESPIRATORY DISTRESS SYNDROME BEFORE AND AFTER SURFACTANT ADMINISTRATION USING ELECTRICAL IMPEDANCE TOMOGRAPHY

I. Chatziioannidis, T. Samaras, P. Karagianni, G. Mitsiakos, P. Malindretos, N. Nikolaidis (Thessaloniki, Greece)

Objective: The aim of our study was to determine immediate changes of global and regional lung function after exogenous surfactant administration in mechanically ventilated infants with respiratory distress syndrome (RDS) using electrical impedance tomography (EIT) measurements.

Methods:

1. Design: prospective study in a NICU at a university hospital,
2. Patients: forty preterm infants (<12 hours old) with RDS,
3. Intervention: low-pressure recruitment maneuver, surfactant administration (SA), minimal adjustments in ventilator settings. Repeated EIT measurements were performed before and after (15–30 min) SA. Global lung function changes were assessed with two markers, namely absolute resistivity (AbsR) and normalized impedance change (ΔZ); redistribution of regional lung ventilation was assessed as well. Airway pressure and arterial blood gases were recorded.

Results: SA resulted in a statistically significant increase of both the AbsR and ΔZ markers. Moreover, there was a ventilation shift towards dorsal – dependent lung areas with less asymmetry in the right to left air distribution.

Conclusions: SA in the recruited lung with RDS modifies regional ventilation, as assessed by EIT, contributing to a more homogeneous air distribution. Furthermore, significant changes in EIT markers reflect improvement of global lung function after SA.

Poster 4

ADDITION OF STEROIDS TO MODIFIED PORCINE SURFACTANT REDUCES CHEMOTAXIS AND SURFACE ACTIVITY

C. Keldermann, G. Walter, E. Herting, G. Stichtenoth (Lübeck, Germany)

Background: Combined treatment with topical steroids and exogenous surfactant is studied in very low birth weight infants in order to reduce inflammation and development of chronic lung disease. However, exogenous surfactant may be sensitive to inactivation.
Objective: To determine biophysical and chemoattractive activity of Curosurf/steroid mixtures *in vitro*.
Methods: Curosurf (2.5 mg/ml) was mixed with dexamethason, fluticasone and budesonide at final concentrations of 0,01 or 1% (w/w). Minimum surface tension of a cyclically compressed bubble was recorded in a pulsating bubble surfactometer during 5 min. Polymorphonuclear leukocytes isolated from healthy volunteers were stimulated with lipopolysaccharide or lipoteichoic acid. Number density was determined after 30 min migration through a polycarbonate membrane using Curosurf/budesonide as chemoattractant.
Results: Addition of 1%, but not of 0.1% budesonide to Curosurf (w/w) is needed for a significant reduction of chemotaxis. Addition of 0.1 and 1% steroids significantly increased minimum surface tension of Curosurf 2.5 mg/ml.
Conclusion: Although addition of budesonide to Curosurf *in vitro* reduces chemotaxis, surface activity is reduced.

Poster 5

PERFUSION INDEX VARIABILITY BEFORE AND AFTER SURFACTANT TREATMENT IN RDS

NN. Karadağ, D. Dilli, A. Zenciroğlu, A. Dursun, BS Karagöl, N. Okumuş (Ankara, Turkey)

Background: Perfusion index (PI) is a noninvasive numerical value of peripheral perfusion obtained from a pulse oximeter. There are few data on peripheral perfusion before and after surfactant treatment.
Objective: To evaluate PI variability before and after surfactant treatment in infants with respiratory distress syndrome (RDS).
Methods: A prospective analysis was performed on preterm newborns with RDS between 1.08.2011 and 31.12.2011 and PI, oxygen saturation (SpO_2) and heart rate were measured before and at 1 and 6 hours after surfactant treatment using the Masimo Rainbow SET Radical7 monitor. Perfusion variability, fraction of inspired oxygen concentration (FiO_2) before and after surfactant treatment were documented.
Results: 24 newborns were diagnosed as having RDS. Median (IQR) birth weight and gestational age were 1165 (935-1420) g and 30 (27.2-31.0) weeks. Surfactant was administered in the first hour of life to all infants. Oxygen requirement was decreased after surfactant. Repeated surfactant was needed in 54.2%. Median (IQR) PI values obtained from right arm were significantly increased after surfactant administration (before: 0.5 (0.4-0.6), 1 hour: 0.8 (0.7-0.9) and 6 hours 0.8 (0.7-0.8) ($p=0.001$). SpO_2 values were positively correlated with PI values in all measurements ($r> 0.60$, $p <0.001$, for all correlations). Body temperatures did not significantly correlate with PI values. Median (IQR) day of mechanical ventilation was 2.5 days (2-5).
Conclusion: Peripheral tissues are sensitive to alterations in perfusion. Peripheral PI has significantly improved in correlation with SpO_2 after surfactant treatment. PI monitoring could be an early marker of hypoperfusion. The study was approved by the Local Ethics Committee.

Poster 6

HYPOTHERMIA DURING TRANSPORTATION IS CRITICALLY IMPORTANT FOR NEWBORNS WITH RDS

A. Dursun, A. Zencirogłu, N.N. Karadag, P. Asan, N. Hakan, BS Karagöl, A. Kundak, N. Okumuş, D. Dilli (Ankara, Turkey)

Background: Numerous infants with respiratory distress syndrome (RDS) are being transferred to tertiary centres. Unfortunately, optimal transport is not always possible.
Objective: To analyze the effect of hypothermia on RDS. The outcome of different types of surfactant treatment was also analyzed.
Methods: A retrospective chart review was undertaken and all the clinically relevant data for babies with RDS between 1.11.2009 and 1.11.2011 were extracted. Axillary temperature <35.9 °C was considered as hypothermia. Data were analysed by SPSS 16.
Results: 174 newborns were diagnosed with RDS (birth weight 1405±572 g, gestational age 29.5±3.4 weeks) and 59% of them were outborn. Surfactant was needed in 89% (beractant; 52.8%, poractant alfa 47.2%). The type of surfactant did not influence any clinical variables including mortality (27.4%). Hypothermia was detected in 61 cases (35%). Hypothermia was significantly more common among the transported newborns (49% vs. 23.8%, p=0.002). Hypotension (58.5% vs. 35.2%, p<0.01), sepsis (47.4% vs 26.4%, p=0.027), intracranial bleeding (47.2% vs 25.7%, p=0.024) and mortality (44% vs.18%, p<0.01) were significantly higher in hypothermic newborns compared to normothermic infants. Hypothermia significantly increased the risk of mortality [OR: 3.3, CI: 95%, (1.4-7.6), p=0.006] in multivariate analysis.
Conclusions: Hypothermia has a deleterious effect on outcome of infants with RDS, and should be aggressively prevented in preterm babies during transportation. The study was approved by the Local Ethics Committee.

Poster 7

COMPARISION OF THE TWO TREATMENT REGIMENS OF NATURAL SURFACTANT PREPARATIONS IN RESPIRATORY DISTRESS SYNDROME; EXPERIENCE FROM TURKEY

S. Özge, B. Deya, G.Tuğba, O. Fahri, K. Güner (Istanbul, Turkey)

Background: Surfactants improve lung function, decrease morbidity and mortality due to respiratory distress syndrome (RDS).
Objective: We compared the effects of two treatment regimens: poractant alfa (Curosurf®) and beractant (Survanta®) on gas exchange, ventilator requirements and outcome in very low birth infants with RDS.
Methods: Seventy-one infants who were hospitalized between January and May 2010 were investigated retrospectively. Stratified random sampling was performed. One group received an initial dose of Curosurf® (200 mg/kg), the other group Survanta® (100 mg/kg). Infants who required a fraction of inspired oxygen (FiO_2) ≥0.40 received additional doses of surfactant (each of 100 mg/kg).
Results: Birth weights of the infants in the Curosurf® (n= 33) and Survanta® (n= 38) groups were 850±322, and 820±239 g, respectively. Infants treated with Curosurf® required a lower peak inspiratory pressure (17±5 vs 18±7) cm H_2O and FiO_2 (0.50±0.20 vs 0.60±0.20), and had lower pCO_2 levels (60±30 vs 71.5±22 mmHg) than the Survanta® group. Durations of mechanical ventilation (8±22 vs 17±33 days) and total oxygen therapy (22±28 vs 30±40 days) were lower in the Curosurf® group. The incidences of intraventricular hemorrhage (36.4% vs 55.3%), bronchopulmonary dysplasia (30.4 vs 52.6%), and duration of hospitalization (27±32 vs 52±45 days) were lower in the Curosurf® group despite the higher incidence of mortality (51% vs 36%). However, these differences did not reach significance ($p<0.05$).
Conclusions: Our results did not show any statistically significant differences between the two treatment regimens.

Poster 8

SERUM IL-6, VASCULAR ENDOTHELIAL GROWTH FACTOR, AND S100B PROTEIN LEVELS ARE INCREASED IN INTRAUTERINE GROWTH RESTRICTED NEWBORNS

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Background: Intrauterine growth restriction (IUGR) complicates 3-4% of all pregnancies and represents a human model of chronic fetal hypoxia. About 15% of IUGR infants develop some degree of neurological damage. Chronic hypoxia increases the levels of circulating pro-inflammatory cytokines, among them- interleukin-6, Vascular Endothelial Growth Factor (VEGF), which stimulates intensive formation of blood vessels of improper construction and causes an increase in fetal-placental vascular resistance and S100B protein as a biochemical marker of CNS damage and inflammation. There are no reliable methods to detect cell damage in the nervous system in these patients as well. We hypothesized that serum levels of interleukin-6 (IL-6), VEGF and S100B marker might differ in IUGR compared to AGA infants.

Methods: We prospectively studied 50 IUGR infants (mean birth weight: 2329 ± 287 g; mean Apgar score in 5-th minute: 9 points, gestation: 38 ± 1,7 weeks) and 50 term, AGA infants as a control group (mean birth weight: 3544 ± 2161 g; mean Apgar score in 5-th minute: 9 points, gestation: 39 ± 3 weeks) born between July 2010 and October 2011. IUGR was defined as birth weight £ 5 centile. We determine serum Il-6 , VEGF nad S100B protein level on 1st day of life. Mean and standard deviations were estimated. For statistical analysis Kolmogorow-Smirnov test was used and interpolated data. P<0,05 was statistically significant.

Results: In IUGR group mean serum level of interleukin-6 was 12,44 pg/ml and standard deviations was 4,2 pg/ml. In control group mean serum level of interleukin-6 was 5,11 pg/ml and standard deviations was 3,71 pg/ml. There was statistical difference between the two groups and mean Il- 6 concentration was higher (p=0,001) in IUGR group. In IUGR group mean serum level of VEGF was 585.65 pg/ml and standard deviations was 574.31 pg/ml. In control group mean serum level of VEGF was 388.42 pg/ml and standard deviations was 371.92 pg/ml. There was no statistical differences between the two groups (p= 0.16). In IUGR group mean serum level of S100B protein level was 0,88 mcg/ml and standard deviations was 0,36 mcg/ml. In control group mean serum level of S100B protein was 0,63 mcg/ml and standard deviations was 0,22 mcg/ml. There was statistical differences between the two groups (p= 0.001).

Conclusion: The difference in IL-6 and S100B level between IUGR and term AGA neonates might indicate central nervous system damage and inflammation in IUGRs. Higher serum VEGF concentrations in IUGR newborns may be one of the elements of the pathophysiology of IUGR. In our study we observed higher levels of VEGF in infants with IUGR compared to eutrophic neonates (AGA), but without statistical significance. Further larger groups studies are necessary.

Keywords: IL-6, Vascular Endothelial Growth Factor, VEGF, S-100B protein, Intrauterine growth restriction, IUGR

Poster 9

ORAL vs. INTRAVENOUS IBUPROFEN FOR PATENT DUCTUS ARTERIOSUS CLOSURE: A RANDOMISED CONTROLLED TRIAL IN EXTREMELY LOW BIRTH WEIGHT INFANTS

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Background: Although oral ibuprofen is more effective than intravenous ibuprofen in the closure of patent ductus arteriosus (PDA) in very low birth weight (VLBW) infants, there is a lack of data on its efficacy and safety in extremely low birth weight (ELBW) infants who constitute the majority of patients with ductal patency in developed countries. **Objective:** To compare the efficacy and safety of oral versus intravenous ibuprofen for the pharmacological closure of PDA in ELBW infants.
Methods: The study enrolled 80 preterm infants with gestational age 28 weeks, birth weight <1000 g, postnatal age 48 to 96 h, and had echocardiographically confirmed significant PDA. Seventy ELBW infants received either intravenous or oral ibuprofen randomly as an initial dose of 10 mg/kg, followed by 5 mg/kg at 24 and 48 h. The success rate and the safety of the drugs in these infants were the major outcomes. **Results:** PDA closure rate was significantly higher with oral ibuprofen (83.3% vs 61.7%) after the first course of treatment (p=0.04). Although the primary closure rate was marginally higher in the oral ibuprofen group, the need for a second course of ibuprofen during the whole hospitalisation was similar between groups: 11 of 36 in oral versus 15 of 34 in intravenous groups (p=0.24) because of a higher reopening rate in the oral group. In addition to no increase in side effects with oral ibuprofen use, the need for postnatal steroid use for chronic lung disease was significantly lower in the oral ibuprofen group (p=0.001).

Poster 10

FAVOURABLE LONG-TERM OUTCOME OF A PATIENT WITH ABCA3 GENE MUTATIONS AND SEVERE NEONATAL LUNG DISEASE

D. Morgillo, M. Fontana, P. Eng, TM. Berger (Lucerne, Switzerland)

Background: Outcome of patients with ABCA3 gene mutations is highly variable, ranging from fatal neonatal respiratory failure to long-term survival with mild chronic lung disease. Patients with ABCA3 deficiency who present with severe respiratory failure in the immediate postnatal period are considered to have a poor prognosis.
Objective and Methods: Case report to illustrate the prognostic variability of patients with ABCA3 deficiency and severe neonatal lung disease.
Results: We present a female infant with two ABCA3 gene mutations who presented with severe neonatal lung disease and two additional episodes of severe respiratory failure in the first six months of life which required invasive respiratory support with high frequency oscillatory ventilation. Fortunately, she responded to hydroxychloroquine therapy and was discharged home after a five-month hospital stay. At the age of four years, she has developed normally, continues on hydroxychloroquine but is off supplemental oxygen.
Conclusions: This case illustrates that the prognosis of patients with ABCA3 gene mutations and severe neonatal lung disease is not uniformly unfavorable. In such patients, a trial of therapy with hydroxychloroquine seems to be warranted.

Poster 11

SURFACTANT DEFICIENCY IN SEVERE BRONCHIOLITIS

F. Hartmann, H.H. Fiori, P.CR. Garcia, J.P. Piva, R.S. da Silva, R.M. Fiori (Porto Alegre, Brazil)

Background: Previous studies showed reduced phospholipids and surfactant protein A (SP-A) levels and immature click test in tracheal fluid of infants with severe bronchiolitis.
Objective: To evaluate production and surfactant function through lamellar body count (LBC) and stable microbubble test (SMT) in infants with severe bronchiolitis.
Methods: Lung fluid was collected from 16 infants of ≤ 12 months of age. Six patients undergoing surgery with normal lungs were used as controls. LBC was performed in a cell counter (Sysmex XT-1800i). The samples were placed in a dithiothreitol (DTT) solution (10 mg/ml). SMT was performed according to the method described by Pattle et al, BJOG 1979; 86: 615.
Results: In the bronchiolitis group LBC was significantly lower than in the control group: median 130,000/μL vs. 875,000/μL ($p<0.001$). The SMT was also significantly lower in the bronchiolitis group: median 10 microbubbles (MB)/mm^2 vs. 248 MB/mm^2 ($p<0.001$).
Conclusions: The data suggest that infants with bronchiolitis have reduced surfactant production and function. We speculate that these tests may identify infants with bronchiolitis who will benefit from surfactant replacement therapy.

Poster 12

USE OF DIFFERENT MODES OF CPAP WITH VARIABLE FLOW IN PRETERM INFANTS WITH VLBW AND ELBW AFTER EXTUBATION: A MULTICENTER RANDOMIZED CLINICAL STUDY

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Background: Our hypothesis is that preterm infants born less than 1500 grams can be extubated to nasal bilevel continuous positive airway pressure (n-BiPAP) and will have a lower risk of extubation failure than infants extubated on to single level, nasal (CPAP).

Objective: To determine what type of noninvasive respiratory support with variable flow is most effective after extubation to prevent re-intubation in preterm patients weighing less than 1500 grams who needed in mechanical ventilation for more than 3 hours.

Methods: We enrolled 110 infants of less than 1500 grams and 33 weeks of gestation. The main diagnosis was RDS and all of them needed conventional mechanical ventilation for more than 3 h after birth. Upon reaching the criteria for extubation infants were randomized into one of two groups of non-invasive support (Group I - CPAP; n = 47, MAP = 5.4 cm H2O) or (Group II – n-BiPAP; n = 53, the lower level of MAP = 4.5 cm H_2O, upper level MAP = 8 cm H_2O, the average MAP = 5.6 cm H_2O). An infant could be transferred from CPAP to the n-BiPAP group to avoid endotracheal intubation because of persistent apneas, increased work of breathing, increased oxygen needs. We evaluated the efficacy of noninvasive respiratory support during 72 hours after extubation, duration of CPAP or n-BiPAP, oxygen requirements, the need for re-intubation, number of episodes of apnea with bradycardia and weight gain.

Results: 10 infants were excluded from the analysis as they did not meet inclusion criteria or were protocol violators. The two groups had similar characteristics at birth (group I vs group II: gestational age 27.8 ± 0.3 vs 27.9 ± 0.3 weeks, p = 0.71; birth weight 1089 ± 194 vs 1128 ± 231 g, p = 0.36). In the CPAP group 7 from 47 (15%) infants needed increase of respiratory support - transfer to mode n-BiPAP. Two were eventually intubated during the first 72 hours after extubation.

Conclusion: The use of variable flow n-BiPAP seems to have some benefits compared to conventional variable flow CPAP in preterm infants undergoing prolonged mechanical ventilation.

Poster 13

RESULTS OF THE NEW NCPAP PROTOCOL IMPLEMENTATION

E. Baybarina, A. Antonov, O. Ionov, O. Borisevich (Moscow, Russia)

Background: In the previous study performed in 2010 we found out early predictors of NCPAP failure and optimal criteria for surfactant treatment&mechanical ventilation (MV). Our results showed that the first predictors of NCPAP failure are clinical signs (Silverman or Downes score >3 points, increasing respiratory rate after 3-6 hours of NCPAP) and parameters of NCPAP (PEEP>6 mm H_2O, FiO_2>30-40%). The laboratory data become indicative much later in time. We updated our protocol on NCPAP use.

Objective. To determine how introduction of the new NCPAP protocol influenced on the frequency of complications.

Methods. Our retrospective study included all babies (N=311) on respiratory support devided into 2 main groups (I (N=209) babies, treated in 2011, II- 102 neonates treated in 2009 (before the new protocol was introduced). We compared frequency of MV and complications (pneumothorax, intraventricular hemorrhage, BPD).)

Results: The frequency of pneumothorax decreased significantly after new protocol introduction (2% in 2011 against 5% in 2009). 1 severe pneumothorax in 2011 happened after non-compliance to the new protocol. There was no significant difference in MV and other complications frequency.

Conclusion: New NCPAP protocol allows to reduce the incidence of air leaks and doesn't lead to higher use of MV.

Poster 14

WORK OF BREATHING DURING MECHANICAL VENTILATION IN PRETERM INFANTS

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Background: It is important to identify which ventilatory mode is associated with reduced work of breathing in preterm infants when weaning from ventilatory support. The diaphragmatic pressure-time product (PTPdi), the integration of transdiaphragmatic pressure over time, reflects the energy expenditure of the diaphragm and has been used as a measure of the work of breathing.
Objective: To compare the PTPdi in preterm infants supported by conventional mechanical ventilation (CMV), synchronous intermittent mandatory ventilation (SIMV) and assist/control (A/C) mechanical ventilation.
Patients and methods: Forty infants (median gestational age 29 weeks) were enrolled in the recovery stage of their respiratory illness. The infants were studied on the different modes of mechanical ventilation in a random order, for 30 minutes each. Mean PTPdi per breath cycle, expressed over one minute for supported and unsupported breaths was calculated during the last minute of each 30- minute period. The study was approved by the Hospital Research Ethics Committee.
Results: Overall the differences in PTPdi according to ventilatory mode were statistically significant ($p<0.0001$). The PTPdi on CMV compared to the PTPdi on SIMV and A/C was significantly higher ($p<0.01$). The PTPdi on A/C was lower than the PTPdi on SIMV ($p<0.01$).
Conclusion: The work of breathing in preterm infants weaning from ventilatory support is lower on synchronized ventilation than on CMV. Preterm infants have lower work of breathing on A/C than on SIMV. These results support the use of synchronized ventilation and probably A/C for weaning of preterm infants from ventilation.

Poster 15

EARLY NEONATAL OUTCOMES AFTER VOLUME-GUARANTEED SYNCHRONIZED INTERMITTENT MANDATORY VENTILATION COMBINED WITH PORACTANT ALFA IN PREMATURE INFANTS WITH RESPIRATORY DISTRESS SYNDROME

S. Guven, S. Bozdag, H. Saner, M. Cetinkaya, AS. Yazar, M. Erguven (Istanbul, Turkey)

Background: Volume guaranteed synchronized intermittent mandatory ventilation (SIMV+VG) is a novel mode of SIMV that provides automatic adjustment of the peak inspiratory pressure to ensure a minimum set tidal volume. There are very limited data about its effects on neonatal outcomes of preterm infants with respiratory distress syndrome (RDS).

Objective: To compare the effects of SIMV+VG with conventional SIMV on short-term outcomes in preterm babies with RDS who were given poractant alpha.

Methods: 72 preterm infants who were admitted with respiratory distress and given poractant alfa for RDS were divided into 2 groups: group 1 comprised infants treated with conventional SIMV and group 2 infants managed with SIMV+VG ventilation. Neonatal morbidities such as bronchopulmonary dysplasia (BPD), intraventricular hemorrhage (IVH), retinopathy of prematurity (ROP), necrotizing enterocolitis (NEC) and duration of mechanical ventilation and total oxygen were recorded.

Results: Infants ventilated with the SIMV+VG mode had significantly shorter ventilation duration and the incidence of oxygen related complications including air leaks, BPD, ROP, IVH and NEC were significantly lower in these infants compared with those ventilated with conventional SIMV.

Conclusions: SIMV+VG ventilation in combination with poractant alfa treatment significantly reduced both duration of mechanical ventilation and neonatal oxygen related morbidities in preterm infants with RDS.

Poster 16

LIPID SURFACTANT KINETICS OF INTUBATED CHILDREN

V.M. Goss, G. Koster, J.P. Townsend, K.C. Goss, MJ. Marsh, I. Macintosh, V.J. Pappachan, A.D. Postle (Southampton, UK)

Background: Acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) are associated with significant morbidity and mortality, in which disruption to the surfactant system is a contributory component. However, trials of surfactant therapy in ALI/ARDS have consistently failed to demonstrate major outcome benefits, possibly due to disease heterogeneity and patients being stratified by clinical indices rather than by underlying disease mechanism.

Objective: To describe a rapid and sensitive method to label and monitor surfactant phosphatidylcholine (PC) metabolism in vivo, with the aim of identifying biochemical causes of surfactant dysfunction in a timescale compatible with informing clinical diagnosis.

Material and methods: Stable isotope labelled (*methyl*-D_9)-choline (D_9C) was infused over 3 h into 21 children (18 with ALI/ARDS and 3 controls). Samples of bronchoalveolar lavage (BAL) fluid were taken at regular intervals. The PC profile of these samples and the incorporation of D_9C was analysed by electrospray ionisation tandem mass spectrometry (ESI-MS/MS).

Results: We demonstrated a rapid uptake of D_9C into PC in BAL fluid and a highly variable rate of synthesis between subjects which may be reflective of the variety of biochemical surfactant abnormalities seen in different individuals.

Conclusion: This method of biological phenotyping has potential for better stratification of patients with ALI/ARDS in therapeutic trials of surfactant therapy.

Ethics: 07/H0606/125

Poster 17

MINIMALLY INVASIVE POSTNATAL RESPIRATORY MANAGEMENT (HIGH-FLOW CPAP AND SURFACTANT TREATMENT WHILE BREATHING SPONTANEOUSLY) AND ITS IMPACT ON MORTALITY, MORBIDITY AND NEURODEVELOPMENTAL OUTCOME OF PRETERM INFANTS BETWEEN 23^{+0} AND 27^{+6} WEEKS OF GESTATION

K. Klebermass-Schrehof, M. Wald, J. Schwindt, N. Haiden, M. Hayde, A. Pollak and A. Berger (Vienna, Austria)

Background: A new mode of surfactant administration without mechanical ventilation has recently been described by Göpel et al (Lancet 2011; 378: 1627) for preterm babies with gestational ages between 26 and 28 weeks. We report a single-center outcome of extremely preterm infants (23 to 27 weeks' gestation) cared for using a similar protocol including early high flow continuous positive airway pressure (CPAP) and surfactant administration while breathing spontaneously.

Objective: To analyse short-term and 1-year corrected age outcome data of preterm infants managed with this new postnatal respiratory management and compare them with outcome data from the Vermont-Oxford-Network (VONN).

Patients and Methods: 224 infants admitted to the Department of Neonatology and Pediatric Intensive Care Unit of the Medical University Vienna and being treated with minimally invasive surfactant administration and high flow CPAP from January 2009 to June 2011 were included in the analysis.

Results: The minimally invasive respiratory management protocol was tolerated by 94% of all infants born between 23 and 27 weeks of gestation and did not increase adverse events or impaired neurodevelopmental outcome at 1-year corrected age. Mortality rates were statistically significantly decreased for babies of 23 weeks' gestation compared to VONN (43% vs 68%, p=0.004). Additionally, we found significantly less chronic lung disease (20% vs. 46%, p=<0.001), cystic periventricular leukomalacia (PVL) (1% vs. 4%, p=0.04), severe cerebral lesions (intraventricular hemorrhage of grades 3/4 + cystic PVL; 9% vs. 16%, p=0.01), retinopathy of prematurity (40% vs. 56%, p<0.001) and a trend towards less need for supplementary oxygen on day 28 (77% vs. 82%, p=0.08); only patent ductus arteriosus occurred significantly more often (74% vs. 63%, p=0.001). More infants stayed on CPAP on day 1 (84%) and day 3 (68%). The rate of any mechanical ventilation in these extremely preterm infants was 34% in the first week of life and 58% during the entire hospital stay.

Conclusion: Surfactant can be effectively and safely delivered via a thin catheter during spontaneous breathing, even in very immature infants, and this method is associated with improved the outcome.

Poster 18

LONG TERM EFFECT OF CORD BLOOD AND GASTRIC ASPIRATE CYTOKINES ON LUNG FUNCTION

I. Štucin Gantar, M. Praprotnik, J. Babnik, B. Wraber, L. Kornhauser Cerar (Ljubljana, Slovenia)

Background: Exposure to prenatal inflammation increases the risk for development of bronchopulmonary dysplasia.
Objective: To evaluate the correlation of cord blood and gastric aspirate levels of interleukin-6 (IL-6) and interleukin-8 (IL-8) in preterm infants on lung function at the age of 8 years.
Methods: In the period 2000-2002 we recruited 129 infants with gestational age < 30 weeks. The concentrations of IL-6 and IL-8 were measured in gastric aspirate and cord blood. At the age of 8 years, 30 ex-preterm infants with mean gestational age of 27 weeks and mean birth weight of 955 grams had pulmonary function measurements (responders). To exclude major bias the comparison between the study and non-responder groups showed no statistically significant differences with respect to perinatal characteristics, ventilation days, bronchopulmonary dysplasia and the cytokine concentrations. The study was aproved by National Ethical Committee.
Results: The pulmonary function test measurments in children born preterm were lower than in their term pairs. However, only the difference in FEF 25%-75% was statistically significant. The concentration of IL-6 and IL-8 in cord blood and in gastric aspirate inversely correlated to all measures of lung fuction at 8 years, however only the correlations between the concentration of IL-8 in cord blood to FEV1/FVC (r=-0.38, p=0.04) and to FEF 25%-75% (r= -0.44, p=0.02) were statistically significant.
Conclusion: There were negative correlations between concentration of IL-8 in cord blood and FEF 25%-75% and FEV1/FVC, which suggests an important role of IL-8 in early airway remodelling.

Poster 19

OUR EXPERIENCE OF THE INSURE METHOD IN NEONATES BORN BEFORE 32 WEEKS OF GESTATION

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Background: Surfactant therapy improves the short-term respiratory status of preterm infants with respiratory distress syndrome (RDS). The INSURE (intubation-surfactant-extubation) method reduces the need for mechanical ventilation and/or the duration of respiratory support in newborns with RDS.
Patients and Methods: Our paper is a retrospective cohort study from September 2004 to December 2011. We included very low birth weight (VLBW) infants with gestational age less than 32 weeks suffering from RDS with increased breathing effort and need for oxygen supplementation. Infants received endotracheal surfactant (Curosurf® – 200 mg/kg) soon after birth and they were extubated during the next hour. Their clinical and outcome data such as: CRIBB II assessment at NICU admission, number of surfactant doses administered per patient, need for intubation and/or mechanical ventilation (MV), duration of MV, duration of respiratory support (including continuous positive airway pressure - CPAP and nasal intermittent mandatory ventilation – nIMV), incidence of bronchopulmonary dysplasia (BPD), patent ductus arteriosus (PDA), retinopathy of prematurity (ROP), other complications of prematurity and mortality were recorded.
Results: 204 infants (106 boys and 98 girls) were treated with one dose of surfactant administered by the INSURE method. In 76% of our group (155 patients) surfactant therapy was administered in the delivery room, in other cases in the NICU. 54 newborns (26%) were born vaginally and 150 newborns (74%) by caesarean section. The gestational age of the babies was between 26-32 weeks (mean 27.3). Birth weight was between 600 – 1495 g (mean 930) and Apgar score at 1 minute was from 4 to 6 (mean 5) and at 5 minutes from 6 to 7 (mean 7). One course of antenatal steroids was administered in 159 pregnancies (78 %). After surfactant administration 6 of our patients required intubation and MV for 48 hours, 9 patients (18,4%) died during hospitalization. Mean duration of nIMV was 7.45 ± 5.15 days (from 18 hours to 18 days) and the mean duration of nCPAP was 8.23 ± 4.48 days (from 0 hours to 14 days). The incidence of grade III intraventricular hemorrhage was in 8.5% and necrotizing enterocolitis 9%. Hemodynamically important PDA was observed in 77 patients (38%), BPD in 20 (9.6%) and ROP in 15 infants (7.2%). The mean time of hospitalization in NICU was 42 ± 12 days (from 22 days to 85 days).
Conclusion: We found that the INSURE method can be applied to the majority of VLBW newborns and it is associated with a high success rate.

Poster 20

DOES INTRAUTERINE INFLAMMATION INCREASE THE RISK FOR DEVELOPMENTAL DELAY IN VERY PRETERM INFANTS?

J. Babnik, V. Globevnik Velikonja, I. Štucin-Gantar (Ljubljana, Slovenia)

Background: Intrauterine inflammation associated with a fetal inflammatory response (FIRS) has been associated with subsequent developmental delay in infancy and childhood.
Objective: To examine the association between intrauterine inflammation and mental and motor performance of former preterm infants.
Methods: Fifty-four children born at mean gestational age 27.2 (range 23-29) weeks were assessed at the age 9.3 (range 8-10) years with the Wechsler Intelligence Scale for Children (WISC-III) and the Movement Assessment Battery for Children (M-ABC). At birth placentas were examined for the presence of inflammation and cord blood was sampled for measurement of interleukins (IL). For the prediction of developmental delay full scale WISC-III <90 (less than average intelligence quotient-IQ) and M-ABC scores >13.5 (severely damaged movement capability) were chosen. The cut-off level >1068 pg/mL for IL-8 was used for the prediction of the FIRS.
Results: Median IQ score 107 (IQR 91, 121) and median score for motor development 9.3 (IQR 5.0, 14.1) demonstrated differences between mental and motor development. In 7.5% of infants the IQ score was <70, in 22.5% <90, whereas in 48% of infants a borderline motor development (M-ABC score >10) was found and 25% had an apparent motor handicap (M-ABC score >13.5). Among the analyzed perinatal factors bronchopulmonary dysplasia (BPD) (OR = 31; p=0.006) and periventricular leukomalacia (PVL) with flare (OR=22; p=0.01) were independently associated with motor handicap and the increased level of IL-8 (OR=7.5; p=0.03) with IQ <90.
Conclusions: The results suggest that BPD and PVL independently increase the risk for severe motor handicap and the increased cord blood IL-8 level is responsible for lower intelligence score in children. Neither placental inflammation nor FIRS were associated with an increased risk of severe motor handicap at a mean age of 9 years.

Poster 21

DOCUMENTATION OF COMMON SIDE EFFECTS OCCURRING DURING GALENIC CAFFEINE CITRATE USE

J. Arand (Tübingen, Germany)

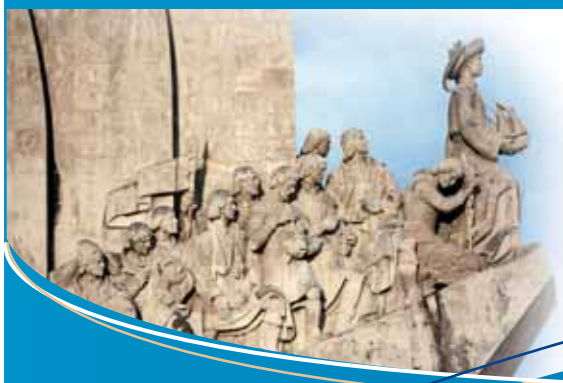
Background: Caffeine citrate is commonly used off-label in preterm neonates. Recently, a licensed preparation has been introduced.
Objective: To document the frequency of clinical signs potentially related to caffeine (tachycardia: resting heart rate >200/min, vomiting and seizures) in infants <34 weeks' gestation receiving galenic caffeine citrate; data on necrotizing enterocolitis (NEC) were also collected.
Methods: During an 18-month period staff in 6 participating NICUs in Germany documented all of the above clinical signs in their NICU residents <34 weeks gestation while writing their daily drug prescriptions using purpose-written software (MediPaed).
Results: Data on 13,854 treatment days in 510 infants were available. During this period of observation, 73 infants (14%) had a total of 138 days with tachycardia documented, 69 infants (13.5%) had an elevated frequency of vomiting documented on 77 treatment days, 8 had seizures documented (plus an additional 8 who showed seizures while not receiving caffeine) and 20 (3.9%) had NEC (5 of these had been off caffeine for >4 days at onset of NEC).
Conclusions: These data may provide a baseline against which clinical signs potentially related to a licensed caffeine preparation can be compared.

Poster 22

UNEVEN ROADS: DILUTED SURFACTANT FOR DIFFICULT-TO-VENTILATE BABIES

D. Mezzetti, A. Fantauzzi, M. Cofini, M. Radicioni (Perugia, Italy)

Background: Our institution has developed an internal protocol to cope with "tricky" ventilatory situations using diluted surfactant lavage. These challenging ventilatory situations range from massive atelectasis with overdistension of the remaining lung to severe lung inhomogeneity (alternating zones of emphysema and atelectasis). The resulting local variations in lung mechanics may preclude finding appropriate ventilatory strategies.
Objective: We describe here a case series of 11 newborns (20 interventions) treated according to this protocol during the course of their illness. Difficulty in ventilation was caused by massive atelectasis in five cases and inhomogeneous lung in fifteen. Resistant hypoxia, unacceptably high ventilatory settings, severe hypercapnia or any combination of these prompted the procedure.
Methods: The procedures were performed at a mean postnatal age of 29 (range: 2.1-55) days. Ten to 18 mL/kg of poractant alfa diluted 1:3 in saline (20 mg/mL) was administered through an endotracheal tube in 2-3 mL aliquots and left in place for about 90 seconds followed by gentle aspiration. Brief tracheal aspirations were repeated twice at 20-minute intervals after the end of the lavage phase. Chest X-rays were obtained before and after the procedure.
Results: Oxygenation index decreased significantly after treatment (Friedman ANOVA: $p < 0.01$). Massive atelectasis was resolved at least partially in all cases but one. Radiological improvement, including resolution of smaller atelectatic zones, was noted in 12/20 cases.
Conclusions: Diluted surfactant lavage may allow some babies with difficult-to-ventilate lungs to overcome hazardous phases in their clinical course.



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OFFICIAL LANGUAGE

English is the official language of the Congress.

Lisbon | Portugal | June 1st-2nd, 2012

1986	Amsterdam, The Netherlands
1987	Mantua, Italy
1988	Belfast, UK
1989	Göttingen, Germany
1990	Sestri Levante, Italy
1991	Heviz, Hungary
1992	San Sebastian, Spain
1993	Oslo, Norway
1994	Jerusalem, Israel
1995	Versailles, France
1996	Tübingen, Germany
1997	Stockholm, Sweden
1998	Belfast, UK
1999	Skagen, Denmark
2000	Kos, Greece
2001	Edinburgh, UK
2002	Cagliari, Italy
2003	Prague, Czech Republic
2004	Vienna, Austria
2005	Belfast, UK
2006	Oslo, Norway
2007	Ancona, Italy
2008	Brugge, Belgium
2009	Ljubljana, Slovenia
2010	Moscow, Russia
2011	Istanbul, Turkey
2012	Lisbon, Portugal
2013	Helsinki, Finland

See you in Helsinki next year

28th International Workshop on
Surfactant Replacement

Chiesi
In neonatology for life

Takeda