Highlights of a Satellite Symposium at the 47th Annual Meeting European Society for Paediatric Research

NEONATAL PULMONARY SYMPOSIUM

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Barcelona, Spain
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ISBN 978 88 7556 259 5

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CERTIFICATO DA CERTIQUALITY
per la sede di Milano

Wolters Kluwer Health
Adis International Ltd, Italy

Via B. Lanino, 5
20144 Milan, Italy

Via R. Gigante, 20
00143 Rome, Italy

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Printed in April 2007 by Arti Grafiche M. Bazzi S.p.A. Milan

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CSECZZ6917

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Abbreviations

AGA	appropriate gestational age
ARDS	acute RDS
BALF	bronchoalveolar lavage fluid
BPD	bronchopulmonary dysplasia
CLD	chronic lung disease
CPAP	continuous positive airway pressure
DL_{CO}	diffusing lung capacity for carbon monoxide
DPPC	dipalmitoylphosphatidylcholine
FABP	fatty acid binding protein
FEF	forced expiratory flow
FEV_1	forced expiratory volume in one second
FRC	functional residual capacity
FVC	forced vital capacity
GA	gestational age
GCMP	giant cystic meconium peritonitis
IL	interleukin
IPPV	intermittent positive pressure ventilation
IUGR	intrauterine growth retardation
IVH	intraveritricul hemorrhage
LCFA	long chain fatty acids
MAS	meconium aspiration syndrome
MDI	mental development index
MV	mechanical ventilation
NCPAP	nasal continuous positive airway pressure
NICHD	National Institute of Child and Human Development
nIPPV	nasal intermittent positive pressure ventilation
NO	nitric oxide
NOS	nitric oxide synthase
OR	odds ratio
$PaCO_2$	partial pressure of carbon dioxide
PDA	patent ductus arteriosus
PEEP	positive end expiratory pressure
PPAR	peroxisome proliferator-activated receptor
PTL	preterm labour
RAW	airway resistance
RDS	respiratory distress syndrome
ROM	rupture of membranes
RV	residual volume
SGA	small gestational age
SIDS	sudden infant death syndrome
SP	surfactant protein
TLC	total lung capacity
VEGF	vascular endothelial growth factor
VLBW	very low birthweight

Introduction

The 47th Annual Meeting of the European Society for Paediatric Research welcomed experts from around the world to Barcelona, Spain. At the Bengt Robertson Award, Professor Shinwell presented an Honorary Lecture on the impact of steroids and surfactant replacement therapy on the outcome of preterm infants. The Neonatal Pulmonary Symposium featured presentations from an international panel of key opinion leaders on the latest research on respiratory diseases in preterm infants.

Professor Jobe opened the symposium with a scene-setting presentation on the physiology of lung development and the mechanics of inflammation, and highlighted evidence to suggest that antenatal exposure to inflammation may actually induce lung maturation.

The past and future of surfactant therapy was unravelled by Professor Halliday. A number of well-designed studies have been conducted in preterm infants; evidence from such trials confirms that surfactant improves outcomes in these infants, particularly when used in conjunction with CPAP. While similar efficacy outcomes have been demonstrated for the available surfactants, current cost-effectiveness data indicate that cost savings are associated with the use of the animal-derived surfactant Curosurf® (poractant alfa).

The availability of surfactant treatment, in addition to other interventions, has meant that VLBW infants now have a greater chance of survival, albeit at the expense of increased pulmonary sequelae. Professor Stocks discussed the long-term respiratory outcomes in preterm infants, and presents available data on lung function as these infants progress into child and adulthood. While the consequences of preterm birth may be reduced over time, they are likely to persist in some individuals. It is clear that improved survival of preterm neonates will enable a greater understanding of the long-term impact of early lung insults.

Dr Guthmann highlighted the potential for the PPAR agonist pioglitazone as an alternative to glucocorticoid treatment. Preclinical data indicate that pioglitazone displays a 'healing' effect and increases the expression of various proteins, including the expression of ABCA3.

The contributions of ABCA3 mutations to pulmonary surfactant deficiency were explored by Dr Danhaive who investigated the phenotypes associated with these mutations in three pedigrees involving infants with RDS and their first-degree relatives.

The contribution of NO to many biochemical interactions is undisputed. It therefore comes as no surprise that NOS isoforms are present in the lung – even in VLBW infants. Professor Sheffield presented data from the most complete human study on the developmental expression of NOS isoforms. It appears on the basis of current evidence it may not always be beneficial to administer exogenous NO in preterm infants.

Professor Shinwell provides an insight into the use of prenatal and postnatal steroids in current clinical practice. A full course of corticosteroids has been associated with beneficial effects in multiple pregnancies, including the prevention of RDS and brain haemorrhage. However, evidence indicates that these agents may be associated with adverse neurological outcomes when administered pre- or postnatally

Preterm infants are surviving at younger and younger gestational ages owing to the efficacy of surfactant replacement therapy, in addition to other interventions, such as CPAP. Emerging data continue to provide insight into the mechanisms and impact of inflammation and early insults on the development of the preterm lung and the subsequent effect on lung function throughout later life.