Clinical Importance of Surfactant Defects

Progress in Respiration Research

Vol. 15

Series Editor
H. Herzog, Basel

S. Karger • Basel • München • Paris • London • New York • Sydney

International Symposium on Clinical Importance of Surfactant Defects, Hamburg, October 31 - November 2, 1979

Clinical Importance of Surfactant Defects

Volume Editor
P. von Wiehert, Hamburg

153 figures and 38 tables, 1981

S. Karger • Basel • München • Paris • London • New York • Sydney

Progress in Respiration Research

Vol. 12: Cough and Other Respiratory Reflexes.
Editors: J. Korpás and Z. Tomori, Martin
Editor: J. Widimsky, Prague
Editor: H. Herzog, Basel

National Library of Medicine, Cataloging in Publication
(Progress in respiration research ; v. 15)
Contents

Foreword VIII

Basic Problems

Batenburg, J.J.; Post, M., and Van Golde, L.M.G. (Utrecht): Synthesis of Surfactant Lipids: Studies with Type II Alveolar Cells Isolated from Adult Rat Lung 1
Clements, J.A.; Oyarzün, M.J. and Baritussio, A. (San Francisco, Calif.): Secretion and Clearance of Lung Surfactant: A Brief Review 20
Hallman, M. (San Diego, Calif.): Fetal Development of Surfactant: Considerations of Phosphatidylcholine, Phosphatidylinositol, and Phosphatidylglycerol Formation 27
Riifer, R. (Mannheim): Mechanical Development in Fetal Lungs 41
Enhorning, G. (Toronto): Pulsating Bubble Technique for Evaluating Pulmonary Surfactant 57
Guyton, A.C. and Moffatt, D.S. (Jackson, Miss.): Role of Surface Tension and Surfactant in the Transepithelial Movement of Fluid and in the Development of Pulmonary Edema 62
Reiss, O.K. and Petty, T.L. (Denver, Colo.): Surfactant Properties in Healthy Men and in Cases of Shock Lung (Manuscript not submitted) 76

Experimental Findings

Corbet, A. (Houston, Tex.): Control of Surfactant Secretion in Fetal and Newborn
Contents VI

Tetley, T.D. and Richards, R.J. (Cardiff): Changes in Pulmonary Surfactant Metabolism and Lung Free Cell Populations from Rats Exposed to Asbestos and Glass Duffs 93

Richards, R.J.; Lewis, R., and Harwood, J.L. (Cardiff): The Effect of Amphiphilic and Antidepressant Drugs on Lung Surface Components Including Surfactant in Experimental Animals 104


Kissler, W.; Morgenroth, K., and Weller, W. (Bochum): Electron Microscopic Findings in Rats after Inhalation of Detergents 121

Leucht, W.; Heyes, H., and Musch, K. (Ulm): Correlation of the Procoagulant Activity in Amniotic Fluid to Gestational Age and Fetal Pulmonary Maturity 126

Whittle, M.J.; Koh, K.S.; Hon, E.H.; Kulovich, M., and Gluck, L. (Los Angeles, Calif.): Relationship between Fetal Heart Rate Patterns and Changes in the Lung Phospholipid Profile during Labor 133

Passi, R.B. and Possmayer, F. (London, Ont.): Surfactant Metabolism in Acute Pancreatitis 136


Respiratory Distress Syndrome of the Newborn and the Adult

Dudenhausen, J.W. (Berlin): Clinical Importance of Surfactant Defects in Perinatology 148


Obladen, M.; Klatt, I., and Bartholome, M. (Heidelberg): Multilamellar Liposome Preparation and Surface Activity of Synthetic Phospholipids 177

Morley, C. and Bangham, A. (Cambridge): Physical Properties of Surfactant under Compression 188

Mitzner, W. and Permutt, S. (Baltimore, Md.): Effect of Ventilation on the Surface Properties of the Lung 194
Biising, C.M.; Bleyl, U., and Riifer, R. (Mannheim): Correlation between Plasma Proteins and Surfactants 224

Contents VII

Therapeutical Approaches

Morley, C. and Bangham, A. (Cambridge): Use of Surfactant to Prevent Respiratory Distress Syndrome 261
Robertson, B. (Stockholm): Treatment of the Premature Rabbit Neonate with Supplementary Surfactant 269
Hary, J. and Rindt, W. (Homburg): Prophylaxis of RDS of the Newborn with Steroids 293
Tierney, D.S. (Los Angeles, Calif.): Experimental Results with Steroids in Adult Animals (Manuscript not submitted) 301
Lohninger, A.; Kriegsteiner, P.; Riedl, W.; Fischbach, F., and Blümel, G. (Vienna): Content of Phospholipid and Dipalmitoyl Lecithin in the Fetal Rat Lung after Treatment with Steroids, Thyroxine and Ambroxol 302
Wolf, H.; Seeger, W.; Suttrop, N., and Neuhof H. (Giessen): Experimental Results in the Prevention of RDS with a-Tocopherol 308

Subject Index 317

Foreword
In recent years interest in the pulmonary surfactant system has very much increased and interesting experimental work has been done. Until now the theoretical view has dominated because the surfactant system plays a basic role in lung physiology. However, it has recently been acknowledged that disturbances in the surfactant system may be of great clinical importance. This was shown very impressively in hyaline membrane disease of the newborn, but there is an extending field of knowledge showing a pathogenetically important role of surfactant in adult diseases like embolism, lung edema and shock lung as well.

The present symposium, held in Hamburg on October 31st and November 1st 1979 discusses the clinical importance of the surfactant system. Different aspects of experimental work, scientific problems of anesthesia, intensive care, obstetrics and pediatrics have been touched upon. These different points of view have led to a mutual benefit of clinical and experimental work and many new ideas and insights into the function of the surfactant system and its role in the pathogenesis of lung diseases as well as possibilities in treating disorders of the surfactant system are presented and discussed.

The symposium was generously supported by: Senat der Freien und Hansestadt Hamburg; Deutsche Forschungsgemeinschaft; Jung-Stiftung für Wissenschaft und Forschung, Hamburg, and Dr. Carl Thomae, Biberach/Riss. This support also made it possible to publish the results of the symposium. The help of Prof. Dr. H. Herzog, Basel, editor of the series Progress in Respiration Research is very much appreciated.

Peter von Wiehert