Peritoneal Dialysis: A Clinical Update

We would like to dedicate this volume to the memory of Germano Pellizzoni: a patient, a friend, a journalist and a person whose spirit and enthusiasm still lives with us.

Centro Studi Ennio Valente & Associazione Amici del Rene di Vicenza
Contents

XI Preface
Ronco, C.; Dell’Aquila, R.; Rodighiero, M.P. (Vicenza)

Basic Elements

1 Factors Affecting Hemodialysis and Peritoneal Dialysis Efficiency
Ronco, C. (Vicenza)

13 Pathophysiology of Peritoneal Transport
Twardowski, Z.J. (Columbia, Mo.)

20 A Simplified Approach to Understanding Urea Kinetics in Peritoneal Dialysis and Hemodialysis
Misra, M.; Nolph, K. (Columbia, Mo.)

28 Peritoneal Ultrafiltration: Mechanisms and Measures
Flessner, M.F. (Jackson, Miss.)

37 Evaluation of the Peritoneal Membrane Function by Three Letter Word Acronyms: PET, PDC®, SPA, PD-Adequest, POL: What to Do?
Van Biesen, W.; Van Der Tol, A.; Veys, N.; Lameire, N.; Vanholder, R. (Ghent)

42 The Initiation of Peritoneal Dialysis: Planning the Initial Prescription
Finkelstein, F.O. (New Haven, Conn.)
Biology of Peritoneal Membrane

48 PD Membrane: Biological Responses to Different PD Fluids
Jörres, A. (Berlin); Witowski, J. (Berlin/Poznan)

54 Repopulation of the Mesothelial Monolayer During Long-Term Experimental Peritoneal Dialysis
Gotloib, L.; Wajsbrot, V.; Shostak, A.; Khirizman, V. (Afula)

62 Fibrosis and Sclerosis: Different Disorders or Different Stages?
Garosi, G.; Cappelletti, F.; Di Paolo, N. (Siena)

70 What Did We Learn From Animal Models in Peritoneal Dialysis?
Lameire, N.; Van Biesen, W.; Mortier, S. (Ghent); De Vriese, A. (Brugge)

Update on Peritoneal Dialysis Solution

77 GDP and AGE Receptors: Mechanisms of Peritoneal Damage
Schwenger, V. (Heidelberg)

84 Effects of Peritoneal Dialysis on the Vascular Bed of Peritoneal Membrane
Van Biesen, W.; Mortier, S.; Lameire, N. (Brugge); De Vriese, A. (Ghent)

90 Effect of PD Solutions on Patient Outcome
Lo, W.-K. (Hong Kong, SAR)

97 Peritoneal Transport with Icodextrin Solution
Heimbürger, O. (Stockholm)

Sodium and Water Homeostasis

104 Dry Body Weight: Water and Sodium Removal Targets in PD
Krediet, R.T. (Amsterdam)

111 Is There a Competition Between Urine Volume and Peritoneal Ultrafiltration in Peritoneal Dialysis Patients?
Kooman, J.P. (Maastricht); Cnossen, N.; Konings, C.J. (Eindhoven); van der Sande, F.M.; Leunissen, K.M. (Maastricht)

119 Application of Bioimpedance Techniques to Peritoneal Dialysis

129 Peritoneal Dialysis: A Clinical Update. Congestive Heart Failure and PD
Tobe, S.W.; Raymond, N.; Ismail, N.A. (Toronto)

Contents VI
Chronic Inflammation in Peritoneal Dialysis

135 MIA Syndrome in Peritoneal Dialysis: Prevention and Treatment
Shahab, I.; Nolph, K.D. (Columbia, Mo.)

144 Being an Inflamed Peritoneal Dialysis Patient – A Dante’s Journey
Carrero, J.J.; Axelsson, J.; Avesani, C.M.; Heimbürger, O.; Lindholm, B.; Stenvinkel, P. (Stockholm)

152 Serum Parameters, Inflammation, Renal Function and Patient Outcome
Lo, W.-K. (Hong Kong, SAR)

156 Sterile Solutions and Peritoneal Inflammation
Flessner, M.F. (Jackson, Miss.)

Peritoneal Dialysis: Adequacy Issues and Beyond

166 Adipokine Signaling in the Peritoneal Dialysis Patient
Axelsson, J.; Carrero, J.J.; Avesani, C.M.; Heimbürger, O.; Lindholm, B.; Stenvinkel, P. (Stockholm)

174 The Effect of Fibrosis on Peritoneal Transport
Flessner, M.F. (Jackson, Miss.)

Reviews in Peritoneal Dialysis

181 Peritoneal Dialysis Infections Recommendations
Piraino, B. (Pittsburgh, Pa.)

187 Cloudy Peritoneal Dialysate: It’s not Always Infection
Teitelbaum, I. (Denver, Colo.)

Twardowski, Z.J. (Columbia, Mo.)

202 How to Optimise Anaemia Therapy in Peritoneal Dialysis Patients
Macdougall, I.C. (London)

214 Calcium and Phosphate Handling in Peritoneal Dialysis
Cozzolino, M.; Gallieni, M.; Chiarelli, G.; Brancaccio, D. (Milan)

Peritoneal Dialysis: A Therapy for Uremia and Beyond

226 Integration of Peritoneal Dialysis in the Treatment of Uremia
Roncò, C.; Dell’Aquila, R.; Rodighiero, M.P.; Di Loreto, P.; Spanò, E. (Vicenza)
235 The Role of Chronic Peritoneal Dialysis in the Management of the Patient with Chronic Kidney Disease
Finkelstein, F.O.; Finkelstein, S.H.; Troidle, L.K. (New Haven, Conn.)

240 Peritoneal Dialysis Is Appropriate for Elderly Patients
Teitelbaum, I. (Denver, Colo.)

247 The Impact of Peritoneal Dialysis Upon Quality of Life and Mortality of Patients with End-Stage Congestive Heart Failure
Gotloib, L.; Fudin, R. (Afula)

Transplantation and Peritoneal Dialysis

254 The Impact of the Pre-Transplant Renal Replacement Modality on Outcome After Cadaveric Kidney Transplantation: The Ghent Experience
Van Biesen, W.; Veys, N.; Vanholder, R.; Lameire, N. (Ghent)

259 Transplantation Outcome in Patients on PD and HD
Cancarini, G.C.; Sandrini, S.; Setti, G.; Bossini, N.; Cassamali, S.; Pertica, N.; Maiorca, P. (Brescia)

Transplantation and Beyond

271 Peritoneal Dialysis after a Failed Transplant
John, B.; Mushahar, L.; Davies, S.J. (Keele)

Automated Peritoneal Dialysis

278 Automated Peritoneal Dialysis – Indications and Management
Negoi, D.; Nolph, K.D. (Columbia, Mo.)

285 APD Schedules and Clinical Results
Durand, P.-Y. (Nancy)

291 Evolution of Technology for Automated Peritoneal Dialysis
Ronco, C. (Vicenza); Amerling, R. (New York, N.Y.); Dell’Aquila, R.; Rodighiero, M.P.; Di Loreto, P. (Vicenza)

New Technologies

310 Continuous Flow Peritoneal Dialysis: Current State-of-the-Art and Obstacles to Further Development
Ronco, C. (Vicenza); Amerling, R. (New York, N.Y.)
321 Continuous Flow Peritoneal Dialysis: Ideal Peritoneal Dialysis or Second-Rate Hemodialysis?
Bargman, J.M. (Toronto)

326 A New Home Based Bioimpedance System for PD
Dell’Aquila, R.; Rodighiero, M.P.; Di Loreto, P.; Spanò, E.; Brendolan, S.; Crepaldi, C.; Nalesso, F.; Corradi, V.; De Cal, M. (Vicenza); Braganò, P. (Pero); Ronco, C. (Vicenza)

336 The Potential Application of Sorbents in Peritoneal Dialysis
Winchester, J.F.; Amerling, R.; Harbord, N. (New York, N.Y.); Capponi, V. (Monmouth Junction, N.J.); Ronco, C. (Vicenza)

344 Author Index

346 Subject Index
The use of peritoneal dialysis is well established worldwide. In spite several advantages have been identified in terms of clinical efficacy, social impact and individual tolerance, peritoneal dialysis is still underutilized around the world. The significance of the present book is mostly related to the effort to identify possible barriers for a wider application of peritoneal dialysis and at the same time to carry forward the project undertaken by the Department of Nephrology Dialysis and Transplantation of Vicenza called USS PD: Understanding, Starting and Sustaining Peritoneal Dialysis. Since 1982, the International Vicenza Course on Peritoneal Dialysis has been considered one of the most important and complete educational events in the field of PD. This book is the compendium of the presentations given by leading experts in the field in the Course of 2006.

The initial part of the course and thus of the book is dedicated to basic principles of PD, assuming that understanding how peritoneal dialysis works is one of the pre requisites to improve the quality of its application and ultimately the outcomes. The second part is dedicated to reviews of important issues which have been debated for many years and for which a state of the art discussion is needed. In depth reviews help the physician to identify the benefits and the problems involved in a PD program and thus become an important step for the process of starting a new program or new patients on PD. The third part is dedicated to potential complications and technical solutions designed to solve the problems of the different techniques. This part corresponds to the phase in which physicians must sustain the use of PD after having acquired the know how and the capacity of starting the program.
In designing such initiative defined USS PD, we looked backward and we analyzed all the difficulties but also all the successes that led Vicenza to become an important reference center for peritoneal dialysis with more than 100 patients currently treated with this renal replacement technique. The acronym reminds the name of the USS Enterprise and the difficult pathway ‘to boldly go where no man has gone before’. The USS PD, includes many initiatives and the Vicenza Course and its book represent some of them. Others are postgraduate masters for physicians, specialization courses for nurses, programs of education such as the ‘PD start’ and the ‘PD GO’ with specific programs for beginners and finally stages for ‘research fellows’ that in several cases have been supported by the International Society of Nephrology. We are indebted with the faculty, with the sponsors, with Mario and Anna Saccardo and with all individuals who made possible these initiatives. We thank Karger for the timely publication of this book with the usual outstanding quality.

We hope that our effort and the USS PD project will push everybody towards a wider utilization of peritoneal dialysis ‘to boldly go where no man has gone before’ i.e. to increase levels of PD utilization beyond any point of the past.

Claudio Ronco, Vicenza
Roberto Dell’Aquila, Vicenza
Maria Pia Rodighiero, Vicenza