Bladder Pain Syndrome

Jørgen Nordling • Jean-Jacques Wyndaele
Joop P. van de Merwe • Pierre Bouchelouche
Mauro Cervigni • Magnus Fall
Editors

Bladder Pain Syndrome

A Guide for Clinicians

Editors
Jørgen Nordling
Department of Urology
Herlev Hospital
University of Copenhagen
Herlev, Denmark

Joop P. van de Merwe
Departments of Immunology and Internal Medicine
Erasmus MC, University Medical Center Rotterdam
Rotterdam, The Netherlands

Mauro Cervigni
Department of Urogynecology S. Carlo-IDI
Department Obstetrics and Gynecology
Catholic University
Rome, Italy

Jean-Jacques Wyndaele
Department of Urology
University Hospital Antwerp and Antwerp University
Edegem, Belgium

Pierre Bouchelouche
Department of Clinical Biochemistry
Koege Hospital
University of Copenhagen
Copenhagen, Denmark

Magnus Fall
Department of Urology
Institute of Clinical Sciences
Sahlgrens Academy at University of Gothenburg
Göteborg, Sweden

ISBN 978-1-4419-6928-6 ISBN 978-1-4419-6929-3 (eBook)
DOI 10.1007/978-1-4419-6929-3
Springer New York Heidelberg Dordrecht London

Library of Congress Control Number: 2012950587

© Springer Science+Business Media New York 2013
This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.
The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.
While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

In 2007 ESSIC (International society for the study of Bladder Pain Syndrome) proposed not more to use the name Interstitial Cystitis (IC) and replace the name with Bladder Pain Syndrome (BPS) [1]. The reason was that no uniform definition existed of IC and the problems arising from the lack of generally approved diagnostic criteria caused enormous problems both clinically and in research. To change a name of a disease is not something you do without careful consideration. It may have severe implications for patients, and their organizations with their aim at IC, and also for insurance and reimbursement practices in different health systems around the world.

When A.J.C. Skene in 1887 introduced the name Interstitial Cystitis (IC) he referred to an inflammatory disease: “When the disease has destroyed the mucus membrane partly or wholly and extended to the muscular parietes, we have what is known as interstitial cystitis…”. [2]. After the introduction of cystoscopes around the beginning of the last century, it was found that the disease had some specific cystoscopic features. These were first described by G.L. Hunner in female patients with severe frequency and pain, appearing as focal red bleeding areas, and he named them elusive ulcers [3, 4]. However, these inflammatory infiltrates are not ulcers, but rather focal inflammatory lesions with a central fragility resulting in a provoked crack or deep wound when the bladder is distended [5]. So in the beginning of the nineteenth century IC was a well-defined disease with microscopic and cystoscopic findings of characteristic inflammatory lesions in the bladder wall, mostly in female patients with severe frequency and bladder pain.

But in 1949 J.R. Hand described “small discrete submucosal hemorrhages, showing variations in form … dot-like bleeding points … little or no restriction to bladder capacity” and he claimed these “glomerulations” as a typical cystoscopic finding in IC [6]. Subsequently, IC became a real elusive disease with a total lack of a proper definition and proper diagnostic tools. E. Messing and T. Stamey underlined this in their paper from 1978 where they described IC as a diagnosis of exclusion in patients with the characteristic symptoms and glomerulations under anesthesia [7]. Unintentionally, the confusion became even greater after the introduction of the initial NIDDK criteria in 1988 [8] and the final NIDDK criteria in 1990 [9].

The NIDDK criteria were not meant as diagnostic, but rather as a means to select comparable patient populations for clinical trials. Nevertheless, these criteria became a worldwide standard for the diagnosis of IC. But the NIDDK criteria included two symptoms: Pain *or* urgency, and two cystoscopic findings: Hunner lesion *or* glomerulations. Urgency has later become the cardinal symptom of Overactive Bladder Syndrome (OAB) and the dispute concerning what exact nature or kind of urgency is characteristic for OAB and what kind for IC [10] is still running.

The problem of definitions was first considered in a terminology report of the International Continence Society in 2002 [11]. The following year, during the first International Conference on IC in Japan in 2003, the worldwide confusion concerning IC became evident [12]. Major differences in the concept of IC were brought to light. Some regarded IC as a frequency-urgency syndrome with or without pelvic pain. Some regarded IC as a cystoscopically defined disease and many did not really know what they should mean. As a consequence of this confusion ESSIC was founded in 2004. Annual meetings and busy Internet discussions in the following years resulted in the 2008 proposal to use the term bladder pain syndrome as the overall denomination, to include all patients with bladder pain within the definition, since interstitial cystitis rather describes a special phenotype with deep inflammation of the bladder wall.

The editors of this book have therefore tried to replace the name interstitial cystitis (IC) with bladder pain syndrome (BPS) throughout the book. The name IC is, however, maintained if the text refers to obvious historical data based on the concept of IC at that time, e.g., in the chapter on epidemiology.

The process of going from IC to BPS has brought major changes in our concepts and knowledge of this disease and we are therefore very happy getting the opportunity to gather all these new data and ideas in the present book.

Herlev, Denmark — Jørgen Nordling
Edegem, Belgium — Jean-Jacques Wyndaele
Rotterdam, The Netherlands — Joop van de Merwe
Copenhagen, Denmark — Pierre Bouchelouche
Rome, Italy — Mauro Cervigni
Göteborg, Sweden — Magnus Fall

References

1. van de Merwe JP, Nordling J, Bouchelouche P, Bouchelouche K, Cervigni M, Daha LK, et al. Diagnostic criteria, classification, and nomenclature for painful bladder syndrome/interstitial cystitis: an ESSIC proposal. Eur Urol. 2008;53(1):60–7.
2. Skene AJC. Diseases of the bladder and urethra in women. New York: William Wood; 1887.
3. Hunner GL. A rare type of bladder ulcer in women; report of cases. Boston Med Surg J. 1915;172:660–4.
4. Hunner GL. A rare type of bladder ulcer. Further notes, with a report of eighteen cases. JAMA 70(4), 203–12.

5. Nordling J, Fall M, Hanno P. Global concepts of bladder pain syndrome (interstitial cystitis). World J Urol. 2012;30(4):457–64.
6. Hand JR. Interstitial cystitis: report of 223 cases (204 women and 19 men). J Urol. 1949;61:291–310.
7. Messing EM, Stamey TA. Interstitial cystitis: early diagnosis, pathology, and treatment. Urology. 1978;12(4):381–92.
8. Gillenwater JY, Wein AJ. Summary of the National Institute of Arthritis, Diabetes, Digestive and Kidney Diseases Workshop on Interstitial Cystitis, National Institutes of Health, Bethesda, Maryland, August 28–29, 1987. J Urol 1988;140(1):203–6.
9. Interstitial Cystitis. London: Springer Verlag; 1990.
10. Abrams P, Hanno P, Wein A. Overactive bladder and painful bladder syndrome: there need not be confusion. Neurourol Urodyn. 2005;24(2):149–50.
11. Abrams P., Cardozo L., Fall M., Griffiths, D., Rosier, P., Ulmsten, U., van Kerrebroeck, P., Victor, A., Wein, A. The standardisation of terminology in lower urinary tract function. Report from the Standardisation sub-committee of the International Continence Society. Neurourol Urodyn. 2002;21:167–78.
12. Ueda T. The legendary beginning of the International Consultation on Interstitial Cystitis. Int J Urol. 2003;10 Suppl:S1–S2.

Contents

1 Historical Perspective 1
Philip M. Hanno

2 Epidemiology 11
Mirja Ruutu, Mikael Leppilahti, and Jukka Sairanen

3 Diagnostic Criteria, Classification and Nomenclature for Bladder Pain Syndrome 21
Joop P. van de Merwe, Jørgen Nordling, Pierre Bouchelouche, Mauro Cervigni, Magnus Fall, and Jean-Jacques Wyndaele

Part I Pathophysiology

4 Clinical Pathophysiology and Molecular Biology of the Urothelium and the GAG Layer 37
Gianfranco Tajana and Mauro Cervigni

5 Mast Cell and Bladder Pain Syndrome 71
Kirsten Bouchelouche and Pierre Bouchelouche

6 Neurophysiology of Pelvic Pain Mechanisms 87
Jean-Jacques Wyndaele and Silvia Malaguti

7 Syndromes Associated with Bladder Pain Syndrome as Clues to its Pathogenesis 103
John W. Warren, Joop P. van de Merwe, and J. Curtis Nickel

Part II Clinical Presentations

8 Bladder Pain Syndrome: Clinical Presentation 119
John Hughes and Mahindra Chincholkar

9 **Pelvic Floor Dysfunction in Bladder Pain Syndrome** 125
Mauro Cervigni and Franca Natale

10 **Psychosocial Risk Factors and Patient Outcomes for Bladder Pain Syndrome** 141
Dean A. Tripp and J. Curtis Nickel

11 **Bladder Pain Syndrome and Sexuality** 163
Jennifer Yonaitis Fariello, Kristene E. Whitmore, and Robert M. Moldwin

Part III Diagnosis

12 **Symptoms of Bladder Pain Syndrome** 177
John W. Warren and Philip M. Hanno

13 **Clinical Evaluation and Diagnosis of Bladder Pain Syndrome** 189
Jennifer Yonaitis Fariello and Kristene E. Whitmore

14 **Urine Biomarkers and Bladder Pain Syndrome** 205
Pierre Bouchelouche and Kirsten Bouchelouche

15 **Cystoscopy and Hydrodistension in the Diagnosis of Bladder Pain Syndrome** 219
Andrey Zaytsev and Magnus Fall

16 **Biopsy Retrieval, Tissue Handling, Morphology, and Histopathological Characteristics** 231
Christina Kåbjörn-Gustafsson and Ralph Peeker

17 **Urodynamics in BPS** 241
Paul P. Irwin and Claus Riedl

Part IV Therapy

18 **Complementary and Alternative Medical Treatments of Bladder Pain Syndrome** 249
Z. Chad Baxter, Helen R. Levey, Jennifer Yonaitis Fariello, and Robert M. Moldwin

19 **Diet and Its Role in Bladder Pain Syndrome and Comorbid Conditions** 259
Justin I. Friedlander, Barbara Shorter, and Robert M. Moldwin

20 **Physiotherapy** 271
Amy Rejba Hoffmann, Hina M. Sheth, and Kristene E. Whitmore

21 **Oral Therapy for Bladder Pain Syndrome Directed at the Bladder** 285
Philip M. Hanno

22 Pain Treatment in Bladder Pain Syndrome 297
John Hughes and Salma Mohammed

23 Intravesical Therapy 307
Mauro Cervigni and Arndt van Ophoven

24 Hydrodistention, Transurethral Resection and Other Ablative Techniques in the Treatment of Bladder Pain Syndrome 317
Magnus Fall, Jørgen Nordling, and Ralph Peeker

25 Botulinum Toxin Treatment in Bladder Pain Syndrome 321
Paul P. Irwin and Paulo Dinis Oliveria

26 Neurostimulation for Bladder Pain Syndrome 329
Dominique El-Khawand and Kristene E. Whitmore

27 Bladder Augmentation, Urinary Diversion and Cystectomy in Patients with Bladder Pain Syndrome 343
Jørgen Nordling, Magnus Fall, and Ralph Peeker

Part V Patient Perspective

28 A Patient Perspective 355
Jane M. Meijlink

29 Exploratory Research on the Social Costs and Care for Patients with Bladder Pain Syndrome 365
Loredana Nasta, Simone Montagnoli, and Maria Avolio

Index 379

Contributors

Maria Avolio Institute of Public Health and Preventive Medicine, National Observatory in Health in the Italian Regions, Catholic University "Sacro Cuore", Rome, Italy

Z. Chad Baxter, MD Urology, Center for Pelvic Health and Reconstructive Surgery, Smith Institute for Urology, North Shore—LIJ School of Medicine, New Hyde Park, NY, USA

Kirsten Bouchelouche, MD, DMSc Smooth Muscle Research Center, Department of Clinical Biochemistry, Koege Hospital, University of Copenhagen, Copenhagen, Denmark

Pierre Bouchelouche, MD Smooth Muscle Research Center, Department of Clinical Biochemistry, Koege Hospital, University of Copenhagen, Copenhagen, Denmark

Mauro Cervigni, MD Department of Urogynecology, S. Carlo-IDI, Rome, Italy

Department Obstetrics and Gynecology, Catholic University, Rome, Italy

Mahindra Chincholkar, MD, FRCA, FFPMRCA Department of Pain Management, Salford Royal Hospital, Salford, UK

Dominique El-Khawand, MD Division of Female Pelvic Medicine and Reconstructive Surgery, Department of Obstetrics and Gynecology, Drexel University College of Medicine, Philadelphia, PA, USA

Magnus Fall, MD, PhD Department of Urology, Institute of Clinical Sciences, Sahlgrens Academy at University of Gothenburg, Göteborg, Sweden

Jennifer Yonaitis Fariello, MSN, CRNP Urology Division, Department of Obstetrics and Gynecology, FPMRS, The Pelvic and Sexual Health Institute, Drexel University College of Medicine, Philadelphia, PA, USA

Justin I. Friedlander, MD The Arthur Smith Institute for Urology, North Shore-Long Island Jewish Health System, New Hyde Park, NY, USA

Philip M. Hanno, MD, MPH Division of Urology, Department of Surgery, Hospital of the University of Pennsylvania, Philadelphia, PA, USA

Amy Rejba Hoffmann, MSN The Pelvic and Sexual Health Institute, Philadelphia, PA, USA

John Hughes, MBBS, FRCA, FFPMRCA Pain Management Unit, The James Cook University Hospital, Middlesbrough, UK

Paul P. Irwin, MCh, FRCSI(Urol) Michael Heal Department of Urology, Mid Cheshire Hospitals NHS Trust, Leighton Hospital, Crewe, Cheshire, UK

Christina Kåbjörn-Gustafsson Department of Pathology, Sahlgrenska University Hospital, Gothenburg, Sweden

Mikael Leppilahti, MD, PhD Seinäjoki Central Hospital, Seinäjoki, Finland

Helen R. Levey, DO, MPH The Arthur Smith Institute for Urology, North Shore–Long Island Jewish Health System, New Hyde Park, NY, USA

Silvia Malaguti, MD Clinical Neurophysiology, Clinical Neurophysiology and Biomechanics of Pelvic Floor Dysfunctions, Milan, Italy

Jane M. Meijlink, BA Hons International Painful Bladder Foundation (IPBF), Rotterdam, The Netherlands

Salma Mohammed, MBBS, FRCA Pain Management Unit, Anaesthesia, Intensive Care & Pain Medicine, The James Cook University Hospital, Middlesbrough, UK

Robert M. Moldwin, MD Urology Division, The Arthur Smith Institute for Urology, North Shore-Long Island Jewish Health System, New Hyde Park, NY, USA

Urology Department, The Hofstra University School of Medicine, New Hyde Park, NY, USA

Simone Montagnoli Social Health Division, Dynamic and Clinical Psychology, Research Department, Institute of Social Affairs, Rome, Italy

Loredana Nasta Italian Interstitial Cystitis Association, Rome, Italy

Franca Natale, MD Department of Urogynecology, S. Carlo-IDI Hospital, Rome, Italy

J. Curtis Nickel, MD, FRCSC Urology Department, Kingston General Hospital, Queen's University, Kingston, ON, Canada

Jørgen Nordling, MD, Dr.med.Sci., FEBU Department of Urology, Herlev Hospital, University of Copenhagen, Herlev, Denmark

Paulo Dinis Oliveria, MD, PhD Department of Urology, Hospital de São João, Porto, Portugal

Ralph Peeker Department of Urology, Sahlgrenska University Hospital, Gothenburg, Sweden

Claus Riedl, MD Urology Department, Landesklinikum Thermenregion Baden, Baden, Austria

Mirja Ruutu, MD, PhD, FEBU Department of Urology, Helsinki University Central Hospital, Helsinki, Finland

Jukka Sairanen, MD, PhD Department of Urology, Helsinki University Central Hospital, Helsinki, Finland

Hina M. Sheth, MS, PT, OCS, MTC Rebalance Physical Therapy, Philadelphia, PA, USA

Barbara Shorter, RD, CDN Didactic Program in Dietetics, Department of Nutrition, Long Island University, Brookville, NY, USA

Gianfranco Tajana, MD Department of Pharmaceutical and Biomedical Sciences (FARMABIOMED), University of Salerno, Salerno, Italy

Dean A. Tripp, PhD Departments of Psychology, Anesthesia & Urology, Queen's University, Kingston, ON, Canada

Arndt van Ophoven, MD, PhD Division of Neuro-Urology, Marienhospital Herne, University Hospital of Bochum, Herne, Germany

Joop P. van de Merwe, MD, PhD Departments of Immunology and Internal Medicine, Erasmus MC, University Medical Center Rotterdam, Rotterdam, The Netherlands

John W. Warren, MD Medicine and Epidemiology and Public Health, University of Maryland School of Medicine, Baltimore, MD, USA

Kristene E. Whitmore, MD Urology Division, Department of Obstetrics and Gynecology, FPMRS, The Pelvic and Sexual Health Institute, Drexel University College of Medicine, Philadelphia, PA, USA

Jean-Jacques Wyndaele, MD, DSci, PhD Department of Urology, University Hospital Antwerp and Antwerp University, Edegem, Belgium

Andrey Zaytsev Department of Urology, Moscow State Medical Stomatological University, Moscow City Hospital, Moscow, Russia