Streptococcal Pharyngitis
Streptococcal Pharyngitis
Optimal Management

Volume Editors

Jean Claude Pechère  Geneva
Edward L. Kaplan  Minneapolis, Minn.

12 figures, 1 in color, and 54 tables, 2004
Contents

1 Introduction

3 Virulence Factors of Streptococcus pyogenes
   D.L. Stevens, Boise, Idaho

3 The Pathogen
3 General Characteristics
4 Microbiological Characteristics
4 Virulence Factors
4 Capsule
4 Cell Wall
5 M-Proteins
5 Immunoglobulin Binding Proteins (M-Like Proteins)
6 Fibronectin Binding Protein (Protein F)
6 Protein SIC (Streptococcal Complement Inhibitory Protein)
6 Opacity Factor
6 Streptolysin O
7 Streptolysin S
7 Deoxyribonucleases A, B, C and D
7 Hyaluronidase
7 Nicotine-Adenine-Dinucleotidase (NADase)
8 Streptokinase
8 Pyrogenic Exotoxins
9 General Pathogenic Mechanisms
9 Anti-Phagocytic Properties
9 Cytokine Induction
10 The Pathogenesis of Pharyngitis
11 Pathogenic Mechanisms in Acute Rheumatic Fever
12 Post-Streptococcal Glomerulonephritis
12 References

16 Clinical Presentations of Pediatric Streptococcal Pharyngitis in Developed Countries
R. R. Tanz, Chicago, Ill.
16 Typical Presentation
18 Scarlet Fever
19 Streptococcal Respiratory Tract Infection in Younger Children
20 Conclusions
21 References

22 Group A Streptococcal Pharyngitis in Adults: Diagnosis and Management
G. S. Peter, A. L. Bisno, Miami, Fla.
22 Group A Streptococcal Pharyngitis in Adults: Diagnosis and Management
22 Incidence
23 Diagnosis of Group A Streptococcal Pharyngitis
23 Signs and Symptoms of Streptococcal Pharyngitis
24 Role of Clinical Criteria
28 Laboratory Testing in the Diagnosis of Strep Pharyngitis in Adults
30 Treatment
32 References

36 Practical Experience with Clinical Algorithms for Reducing Unnecessary Antibiotic Use in the Management of Streptococcal Pharyngitis
W. J. McIsaac, Toronto, Ont.
36 The Management of Sore Throat by Primary Care Physicians
38 The Role of Clinical Error in Antibiotic Overuse
39 Clinical Algorithms, Prediction Rules and the Reduction of Clinical Error
40 The Sore Throat Score Management Approach
42 Reliability in Different Clinical Settings
44 The Potential Impact of the Score Approach on Unnecessary Antibiotic Prescriptions
45 Limitations of the Score Approach
46 Conclusions
47 References
48 Recommended Reading

49 Epidemiology, Clinical Presentations, and Diagnosis of Streptococcal Pharyngitis in Developing Countries of the World
M. C. Steinhoff, A. W. Rimoin, Baltimore, Md.
49 Epidemiology
50 High Income Countries
82 Other Streptococcal Antibody Tests
82 Anti-Hyaluronidase Titer (AHT)
82 References

85 Diagnosis of Non-Suppurative Complications of Group A Streptococcal Pharyngitis
P. Ferrieri, Minneapolis, Minn.
85 Acute Post-Streptococcal Glomerulonephritis
88 Pathogenesis of Acute Post-Streptococcal Glomerulonephritis
89 Acute Rheumatic Fever
90 Epidemiology and Clinical Manifestations of Rheumatic fever
91 Pathogenesis of Rheumatic Fever
92 Post-Streptococcal Reactive Arthritis
93 Pathogenesis of PSRA
93 References

95 Diagnosis and Management of Suppurative Complications of Streptococcal Pharyngitis
P. Gehanno, Paris
96 Collection of Pus
96 Peritonsillar Abscess
97 Parapharyngeal Abscesses
97 Abscesses in the Prestyloid Space
97 Abscesses in the Retrostyloid Space
98 Extensive Cervical Cellulitis and Necrotising Fasciitis
99 Constitutional Symptoms
99 Local and Regional Manifestations
99 Physical Findings
100 Investigations
100 Treatment and Course
101 Type of Surgical Drainage
101 Prognosis
102 References

103 Antibiotic Treatment for Streptococcal Pharyngitis. Penicillin First?
J.C. Salazar, Hartford, Conn.
103 Historical Perspective
104 Pharmacology
104 Chemical Composition and Mode of Action
105 Pharmacodynamics/Pharmacokinetics
105 Dosage and Route of Administration for GABHS Pharyngitis
106 Side Effects
107 Clinical Efficacy of Penicillin for Treatment of GABHS
115 **Antibiotic Treatment for Streptococcal Pharyngitis.**

*What is the Role of Oral Cephalosporins*

* D. Adam, M. Helmerking, Munich

116 Antimicrobial Therapy
117 Other Explanations for Treatment Failure with Penicillin
117 The Role of Oral Cephalosporins
117 Effectiveness of Short Course Therapy
119 Clinical Efficacy
119 Resolution of Clinical Symptoms
119 Recurrence of Tonsillopharyngitis
119 Eradication of GABHS
120 Oral Antibiotics for Short Course Therapy
121 Antibiotic Prescription for Patients with Sore Throat
121 References

124 **What is the Current Role of Macrolides and Ketolides in the Treatment of Group A Streptococcal Pharyngitis?**

* A. Bryskier, Romainville; G. Cornaglia, Verona

124 Macrolide Antibiotics
125 Microbiology
125 In vitro Activities Against Susceptible *S. pyogenes*
125 Impact on Oral Flora
126 Pharmacokinetics
126 Distribution in Tonsillar Tissue
127 Concentrations in Saliva
129 Clinical Efficacy
130 Erythromycin
132 Clarithromycin
133 Azithromycin
133 Roxithromycin
133 Dirithromycin
135 Flurithromycin
135 Spiramycin
135 Josamycin
136 Telithromycin
137 Conclusion
137 References

143 **Mechanisms of Antibiotic Resistance in Streptococcus pyogenes**
   N. Yamanaka, Wakayama

143 Oral Antimicrobial Susceptibilities of *Streptococcus pyogenes*
144 Mechanisms of Macrolides Resistance in *Streptococcus pyogenes*
144 rRNA Methylyases
146 Efflux System
147 Molecular Epidemiology of Erythromycin Resistance Genes in *Streptococcus pyogenes*
148 Conclusion
148 References

150 **Macrolide Resistance of Streptococcus pyogenes**
   G. Cornaglia, Verona; A. Bryskier, Romainville

151 Mode of Action of 14- and 15-Membered Ring Macroolides and Ketolides
152 Molecular Basis of Macrolide Resistance
152 Modification of the Target Site
153 Erythromycin A Efflux
154 Laboratory Detection of Resistance
155 Epidemiology of Erythromycin A Resistance
155 Early Reports
156 The Last Decade and the Spread of Macrolide Resistance in Europe
157 Susceptibility Reports from Asia and Australia
157 Susceptibility Reports from North America and Latin America
158 Present Trends
160 Role of Low-Level Resistance and Clinical Importance of the Different Macrolides
162 References

166 **Cost Issues in Streptococcal Pharyngitis**
   J.C. Pechère, Geneva

167 Is Microbiological Diagnosis of Streptococcal Pharyngitis Cost Effective?
167 First Approaches
168 Hypothetical Cohorts and Meta-Analysis
169 Prospective Study in France
170 Cost-Effectiveness of Antibiotic Therapy for Sore Throat
170 The Western World
170 Impact on Symptoms
170 Impact on Complications
170 Side Effects of Antibiotics
171 Third World
172 General Conclusion
172 References
Practical Problems Associated with the Prevention of Initial and Recurrent Attacks of Acute Rheumatic Fever in Developing Countries
S.R. Zaher, A. Mandil, Alexandria

Governmental Involvement
Economic Constraints
Physicians’ Attitudes in Management
Negligence of Health Education
Reluctance in the Laboratory Diagnosis of Group A Streptococcal Pharyngitis
Inappropriate Reliance on the Anti-Streptolysin O Antibody Titer as a Diagnostic/Prognostic Test
Inappropriate Antibiotic Therapy for Group A Streptococcal Pharyngitis Once Diagnosed
Premature Discontinuation of Penicillin Prophylaxis
Social and Cultural Constraints
Patient Compliance with Treatment Protocols
Primary Prevention
Secondary Prevention
Health Education and Public Involvement
Pharmacokinetics of Benzathine Penicillin G
Technique of Injection
References

Streptococcal Pharyngitis: A Continuing Important Public Health Issue Worldwide
T.E. Tupasi, Makati

Risk Groups for GAS
Health and Economic Impact of GAS
Public Health Approaches in the Control of Group A Streptococcal Infections
References

Practical Management of Pharyngitis: The Costa Rica Experience and Its Impacts on Public Health
A. Arguedas, E. Mohs, San José

The Costa Rican Experience
References

Vaccine Control Strategies against Group A Streptococcal Infections. Expectations, Hopes and Possible Impact
M.F. Good, K.S. Sriprakash, D.J. Kemp, Herston

GAS Vaccine Approaches
The M Protein
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>205</td>
<td>Fibronectin-Binding Proteins (FBPs)</td>
</tr>
<tr>
<td>206</td>
<td>C5a Peptidase</td>
</tr>
<tr>
<td>206</td>
<td>Spa18, Another Coiled-Coil Protein</td>
</tr>
<tr>
<td>207</td>
<td>Toxins</td>
</tr>
<tr>
<td>208</td>
<td>Is a Vaccine Against Scabies Possible?</td>
</tr>
<tr>
<td>208</td>
<td>The Need for a Scabies Vaccine</td>
</tr>
<tr>
<td>208</td>
<td>Evidence for a Role of Immunity in Self-Limiting Normal Scabies</td>
</tr>
<tr>
<td>209</td>
<td>Tick Vaccine Studies: ‘Concealed Antigens’</td>
</tr>
<tr>
<td>210</td>
<td>House Dust Mite Allergens</td>
</tr>
<tr>
<td>210</td>
<td>A Vaccine Strategy for Scabies</td>
</tr>
<tr>
<td>210</td>
<td>Conclusion</td>
</tr>
<tr>
<td>211</td>
<td>References</td>
</tr>
</tbody>
</table>

### 215 Author Index

### 216 Subject Index