

The first nationwide surveillance of bacterial respiratory pathogens conducted by the Japanese Society of Chemotherapy (JSC)

Y. Niki¹, S. Kohno¹, N. Aoki¹, A. Watanabe¹, M. Yagisawa¹, J. Sato¹ & H. Hanaki²

1) JSC Surveillance Committee & 2) The Kitasato Institute

Introduction

JSC conducted the first nationwide surveillance of bacterial respiratory pathogens in 2006.

Material & Methods

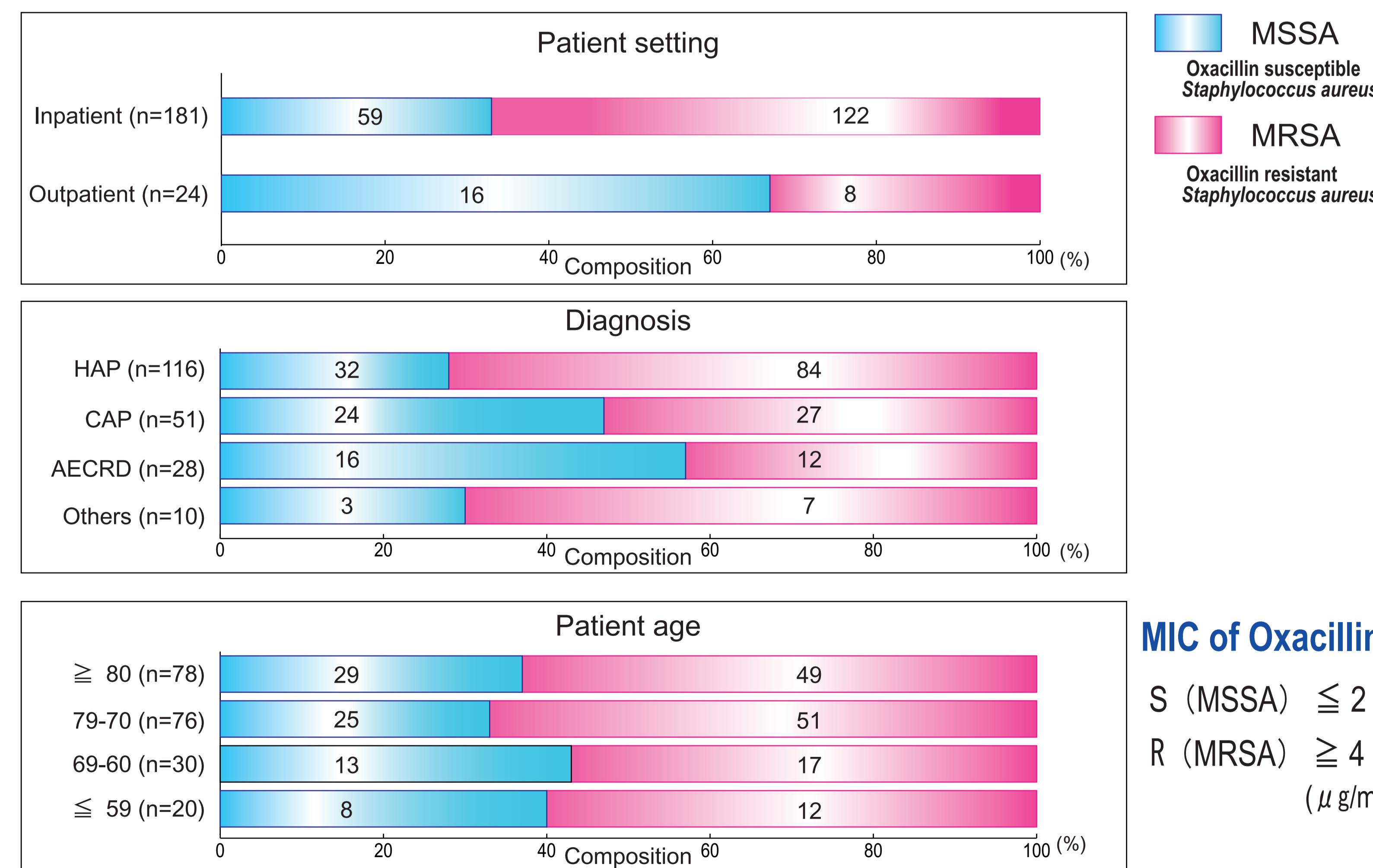
- 1) Surveillance period : January - April, 2006.
- 2) Cooperative institutes : 34 Hospitals thoroughput Japan.
- 3) Strains tested : Isolates obtained from sputum, specimens by trans-tracheal aspiration (TTA) and/or bronchoscopy (confirmed by qualitative culture, by Gram-staining etc.) of well-defined adult respiratory tract infection (RTI) patients [community-acquired pneumoniae (CAP), hospital-acquired pneumoniae (HAP), acute exacerbations of chronic respiratory diseases (AEGRD), and others].
- 4) Antibacterial agents tested : 42 Agents as listed in Table. 1.
- 5) Susceptibility test : Conducted at the central laboratory (The Kitasato Institute, Anti-infection Drugs Research Center) according to CLSI standards for broth microdilution methods.
- 6) Determination of β -lactamase : Nitrocefin method and Cica-Beta Test [Kanto Chemicals, Tokyo] for detection of extended-spectrum β -lactamase (ESBL) and metallo- β -lactamase (MBL)].

	<i>Staphylococcus aureus</i>	<i>Streptococcus pneumoniae</i>	<i>Streptococcus pyogenes</i>	<i>Moraxella catarrhalis</i>	<i>Haemophilus influenzae</i>	<i>Klebsiella pneumoniae</i>	<i>Pseudomonas aeruginosa</i>	Total
Numbers collected	250	210	9	93	173	80	149	924
Numbers tested	205	200	9	91	165	74	143	887

Results

Susceptibilities(Table.1) and current trends of resistant (Fig.1-3) in the three major bacterial respiratory pathogens.

Fig. 1 Proportions of MRSA under stratifications
Staphylococcus aureus (n=205)

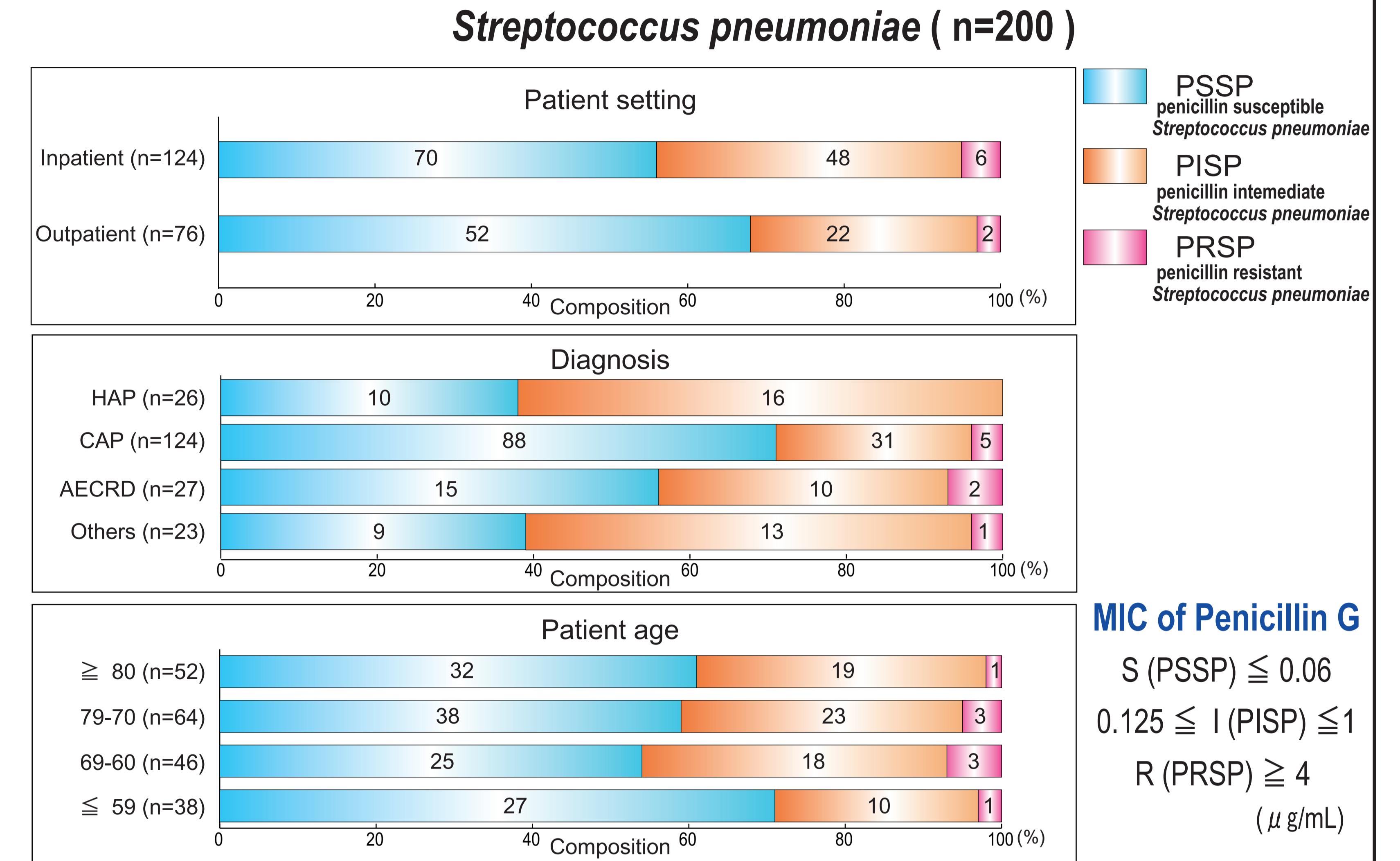


* MRSA was dominant (67.4%) in *S.aureus* isolated from inpatients whereas less frequent (33.3%) in those from outpatients.

* Higher frequency (72.4%) of MRSA was noted in HAP patients than CAP (52.9%) or AEGRD (42.9%) patients.

* No difference in isolation frequency of MRSA was found under stratification by patient age (56.7- 67.1% ; Av 63.2%).

Fig. 2 Proportions of PISP and PRSP under stratifications



- * PISP in inpatients (38.7%) tended to be more frequent than in outpatients (28.9%).
- * PRSP in adult inpatients (4.8%) and adult outpatients (2.6%) was significantly less frequent than those reported in pediatric patients (26.9% ; Sunakawa K, 2005).
- * PISP was significantly higher in HAP (61.5%) patients than in AEGRD (37%) and CAP (25.0%) patients.
- * PISP tended to be more frequent in patients older than 60 years (38.7%) than in those younger than 60 years (27.0%) though the difference was not statistically significant.

Table.1 Susceptibility of 3 major respiratory pathogens to antibacterial agents (μg/mL)

Antibacterial agent	<i>Staphylococcus aureus</i> (n=205)			<i>Streptococcus pneumoniae</i> (n=200)			<i>Haemophilus influenzae</i> (n=165)		
	MIC range	MIC ₅₀	MIC ₉₀	MIC range	MIC ₅₀	MIC ₉₀	MIC range	MIC ₅₀	MIC ₉₀
Penicillin G	≤ 0.06 - 128	16	64	≤ 0.06 - 2	≤ 0.06	1	≤ 0.06 - 256	4	8
Ampicillin	0.125 - 128	16	64	≤ 0.06 - 8	0.125	2	0.125 - 256	2	8
Ampicillin / Sulbactam	0.125 - 64	16	32	≤ 0.06 - 8	0.125	2	0.125 - 16	2	4
Amoxicillin / Clavulanate	0.125 - ≥ 128	16	32	≤ 0.06 - 4	≤ 0.06	1	0.25 - 16	2	8
Piperacillin	0.5 - ≥ 256	64	≥ 256	≤ 0.06 - 4	≤ 0.06	2	≤ 0.06 - 256	≤ 0.06	0.25
Piperacillin / Tazobactam	0.5 - ≥ 256	64	≥ 256	≤ 0.06 - 8	≤ 0.06	2	≤ 0.06 - 128	≤ 0.06	0.125
Cefaclor	0.5 - ≥ 256	128	≥ 256	≤ 0.06 - 128	1	32	0.125 - 256	8	64
Cefdinir	0.125 - ≥ 128	≥ 128	≥ 128	≤ 0.06 - 8	0.25	4	≤ 0.06 - 16	2	8
Cefcapene	0.5 - ≥ 256	≥ 256	≥ 256	≤ 0.06 - 2	0.25	0.5	≤ 0.06 - 4	0.5	2
Cefditoren	0.25 - ≥ 128	64	≥ 128	≤ 0.06 - 1	0.125	0.25	≤ 0.06 - 1	≤ 0.06	0.25
Cefazolin	0.25 - ≥ 256	128	≥ 256	≤ 0.06 - 4	0.25	2	0.25 - ≥ 256	8	128
Cefotiam	0.5 - ≥ 256	64	≥ 256	≤ 0.06 - 8	0.25	2	0.125 - 64	8	64
Ceftazidime	2 - ≥ 128	≥ 128	≥ 128	≤ 0.06 - 16	2	8	≤ 0.06 - 8	0.25	0.5
Ceftriaxone	1 - ≥ 256	≥ 256	≥ 256	≤ 0.06 - 2	0.25	1	≤ 0.06 - 1	0.125	0.5
Cefepime	2 - ≥ 256	64	≥ 256	≤ 0.06 - 1	0.5	1	≤ 0.06 - 32	1	2
Cefozopran	0.5 - 128	16	32	≤ 0.06 - 2	0.25	1	≤ 0.06 - 64	4	16
Cefmetazole	1 - 128	16	64	≤ 0.06 - 8	0.5	4	0.125 - 32	4	8
Aztreonam							≤ 0.06 - 16	0.5	2
Imipenem	≤ 0.06 - ≥ 128	8	64	≤ 0.06 - 0.5	≤ 0.06	0.125	≤ 0.06 - 32	0.5	4
Piperacilin	≤ 0.06 - 64	8	32	≤ 0.06 - 0.125	≤ 0.06	≤ 0.06	≤ 0.06 - 16	0.5	2
Meropenem	≤ 0.06 - 64	8	32	≤ 0.06 - 1	≤ 0.06	0.25	≤ 0.06 - 2	0.125	0.5
Biapenem	≤ 0.06 - 128	8	32	≤ 0.06 - 1	≤ 0.06	0.25	≤ 0.06 - 32	2	8
Doripenem	≤ 0.06 - ≥ 32	4	16	≤ 0.06 - 1	≤ 0.06	0.25	≤ 0.06 - 4	0.25	1
Gentamicin	0.125 - ≥ 256	0.5	128	0.5 - 32	8	8	0.125 - 4	1	1
Amikacin	1 - ≥ 256	8	32	0.5 - 128	64	128	0.25 - 8	4	8
Arbekacin	0.25 - 8	0.5	1	0.25 - 64	16	32	0.25 - 8	2	4
Ciprofloxacin	≤ 0.06 - ≥ 256	16	≥ 256	≤ 0.06 - 32	1	2	≤ 0.06 - 8	≤ 0.06	0.06
Levofloxacin	≤ 0.06 - ≥ 256	8	≥ 256	≤ 0.06 - 8	1	2	≤ 0.06 - 4	≤ 0.06	0.06
Tosuflloxacin	≤ 0.06 - ≥ 32	8	≥ 32	≤ 0.06 - 8	0.125	0.25	≤ 0.06 - 32	≤ 0.06	0.06
Gatifloxacin	≤ 0.06 - ≥ 256	2	64	≤ 0.06 - 4	0.25	0.5	≤ 0.06 - 2	≤ 0.06	0.06
Pazufloxacin	0.125 - ≥ 256	4	≥ 256	0.5 - 32	2	2	≤ 0.06 - 4	≤ 0.06	0.06
Minocycline	≤ 0.06 - 32	0.25	16	≤ 0.06 - 16	2	8	≤ 0.06 - 2	0.25	0.5
Erythromycin	0.25 - ≥ 256	≥ 256	≥ 256	≤ 0.06 - ≥ 256	2	≥ 256	0.5 - 16	4	4
Clarithromycin	0.125 - ≥ 128	≥ 128	≥ 128	≤ 0.06 - ≥ 128	2	≥ 128	0.25 - 32	8	8
Azithromycin	0.25 - ≥ 128	≥ 128	≥ 128	≤ 0.06 - ≥ 128	4	≥ 128	≤ 0.06 - 2	0.5	1
Telithromycin	≤ 0.06 - ≥ 64	≥ 64	≥ 64	≤ 0.06 - 1	≤ 0.06	0.25	≤ 0.06 - 8	1	2
Clindamycin	0.125 - ≥ 256	≥ 256	≥ 256	≤ 0.06 - ≥ 256	0.125	≥ 256	≤ 0.06 - 64	8	16
Vancomycin	0.5 - 2	1	1						
Teicoplanin	0.25 - 8	1	1						
Linezolid	1 - 4	2	4						
Oxacillin	≤ 0.06 - ≥ 256	64	≥ 256						
Cefoxitin	2 - ≥ 256	≥ 256	≥ 256						