P 107

Nationwide Surveillance of Bacterial Pathogens Isolate from Patients with Lower Respiratory Infections in Japan

Y. Niki[1)], S. Kohno[1)], N. Aoki[1)], A. Watanabe[1)], M. Yagisawa[1)], J. Sato[1)] & H. Hanaki[2)]

1) Japanese Society of Chemotherapy (JSC) Surveillance Committee & 2) Kitasato University

Introduction

Japanese Society of Chemotherapy (JSC) conducted the third nationwide surveillance of bacterial respiratory pathogens in 2008. We compared the JSC date of respiratory pathogens for past three years.

Materials & Methods

1) Surveillance period : January – August, 2008.
2) Cooperative institutes : 33 Hospitals throughout 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 pneumonia (CAP), hospital-acquired pneumonia (HAP), acute exacerbations of chronic respiratory diseases (AECRD), and others].
4) Antibacterial agents tested : 44 agents as listed in Table. 2.
5) Susceptibility test : Conducted at the central laboratory (Kitasato University, Anti-infection Drugs Research Center) according to CLSI standards for broth micro dilution methods.
6) For classification of penicillin susceptibility in *Streptococcus pneumoniae*, M-100 S-17 (January, 2007) was employed.
7) 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)].

Table.1 Bacterial Strains

	Staphylococcus aureus	*Streptococcus pneumoniae*	*Streptococcus pyogenes*	*Moraxella catarrhalis*	*Haemophilus influenzae*	*Klebsiella pneumoniae*	*Pseudomonas aeruginosa*	*Total*
Numbers collected	197	260	7	111	220	130	172	1097
Numbers Tests	189	211	6	106	187	126	162	987

Fig.1 Proportions of *S. aureus*, *S. pneumoniae* and *H. influenzae* under stratifications for past three years

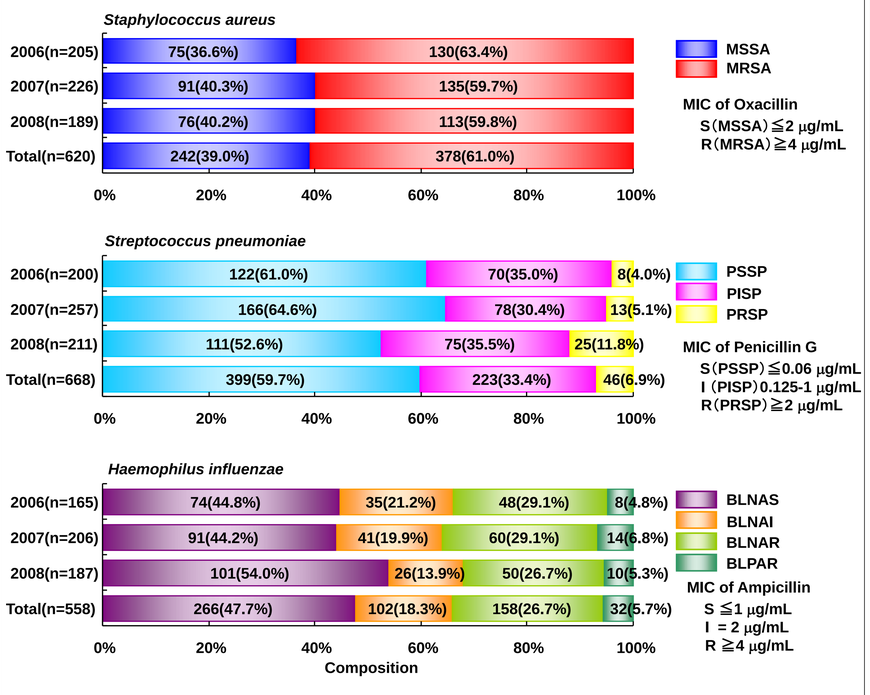
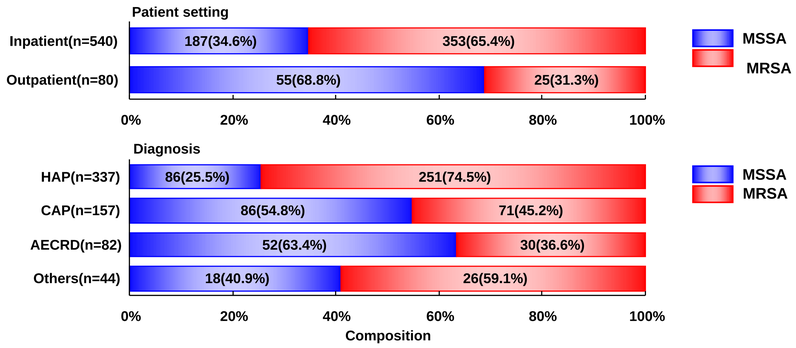
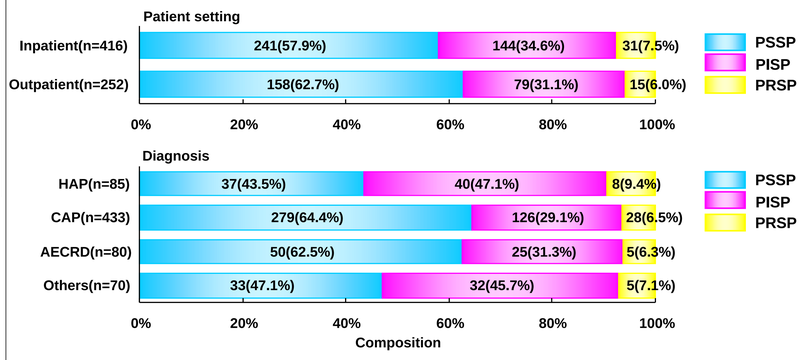


Fig.2 Proportions of MRSA under stratifications for past three years
***Staphylococcus aureus* (n=620)**



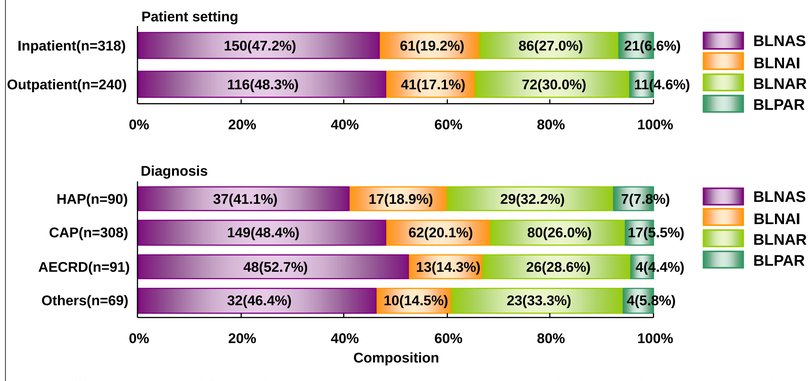
- MRSA was dominant (65.4%) in *S. aureus* isolated from inpatients whereas significantly less frequent (31.3%) in those from outpatients.
- Significantly high frequency (74.5%) of MRSA was noted in HAP patients than CAP (45.2%) or AECRD (36.6%) patients.

Fig.3 Proportions of PISP and PRSP under stratifications for past three years
***Streptococcus pneumoniae* (n=668)**



- Penicillin-nonsusceptible *S. pneumoniae* (PNSSP; PISP+PRSP) tended to be more frequent in inpatients (42.1%) than in outpatients (37.1%).
- PNSSP tended to be more frequent in HAP (56.5%) than in CAP (35.6%) and in AECRD (37.5%).

Fig.4 Proportions of BLNAI, BLNAR and BLPAR under stratifications for past three years
***Haemophilus influenzae* (n=558)**



- Ampicillim-nonsusceptible *H. influenzae* (ANSHI; BLNAI+BLNAR+BLPAR) tended to be same between in inpatients (52.8%) and in outpatients (51.7%).
- Tendency of ANSHI were significantly the same in all types of respiratory infection.

Table.2 Susceptibility of 3 major respiratory pathogens to antibacterial agents for past three years

antibacterial agent	*Staphylococcus aureus* (n=620)			*Streptococcus pneumoniae* (n=668)			*Haemophilus influenzae* (n=558)		
	MIC range	MIC_{50}	MIC_{90}	MIC range	MIC_{50}	MIC_{90}	MIC range	MIC_{50}	MIC_{90}
Penicillin G	≤0.06 - 128	16	32	≤0.06 - 4	≤0.06	1	≤0.06 - ≥256	2	8
Ampicillin	0.125 - 128	16	64	≤0.06 - 8	0.125	2	0.125 - ≥256	2	8
Ampicillin/Sulbactam	0.125 - 64	8	32	≤0.06 - 8	0.125	2	≤0.06 - 16	2	8
Amoxicillin/Clavulanate	0.125 - ≥128	16	32	≤0.06 - 8	≤0.06	1	0.125 - 32	2	8
Piperacillin	0.5 - ≥256	64	≥256	≤0.06 - 8	≤0.06	2	≤0.06 - ≥256	≤0.06	0.25
Piperacillin/Tazobactam	0.25 - ≥256	64	128	≤0.06 - 4	≤0.06	2	≤0.06 - 1	≤0.06	0.125
Cefaclor	0.5 - ≥256	128	≥256	≤0.06 - ≥256	1	32	0.125 - 128	8	32
Cefdinir	≤0.06 - ≥128	64	≥128	≤0.06 - 16	0.25	4	≤0.06 0 ≥256	1	8
Cefcapene	0.25 - ≥256	≥256	≥256	≤0.06 - 16	0.25	0.5	≤0.06 - 8	0.25	2
Cefditoren	0.25 - ≥128	64	≥128	≤0.06 - 8	0.125	0.5	≤0.06 - 2	≤0.06	0.25
Cefazolin	0.25 - ≥256	128	≥256	≤0.06 - 8	0.25	2	0.25 - ≥256	8	128
Cefotiam	0.25 - ≥256	64	≥256	≤0.06 - 16	0.25	4	0.25 - 128	4	64
Ceftazidime	4 - ≥128	≥128	≥128	≤0.06 - 64	4	8	≤0.06 - 8	0.125	0.5
Ceftriaxone	2 - ≥256	≥256	≥256	≤0.06 - 8	0.25	1	≤0.06 - 1	≤0.06	0.25
Cefepime	0.5 - ≥256	64	≥256	≤0.06 - 8	0.25	1	≤0.06 - 16	0.5	2
Cefozopran	0.25 - ≥256	16	64	≤0.06 - 8	0.25	1	≤0.06 - ≥256	4	8
Cefmetazole	0.5 - 128	16	64	≤0.06 - 32	0.5	8	0.5 - 128	4	16
Aztreonam							≤0.06 - 16	0.25	2
Imipenem	≤0.06 - ≥128	16	64	≤0.06 - 2	≤0.06	0.25	≤0.06 - 32	1	4
Panipenem	≤0.06 - ≥256	8	32	≤0.06 - 1	≤0.06	0.125	≤0.06 - 16	0.5	2
Meropenem	≤0.06 - 128	8	32	≤0.06 - 2	≤0.06	0.25	≤0.06 - 2	≤0.06	0.5
Biapenem	≤0.06 - 128	16	64	≤0.06 - 2	≤0.06	0.25	≤0.06 - 32	2	8
Doripenem	≤0.06 - 64	4	16	≤0.06 - 1	≤0.06	0.25	≤0.06 - 4	0.125	1
Faropenem*	≤0.06 - ≥256	64	≥256	≤0.06 - 1	0.125	0.25	0.125 - 8	1	4
Gentamicin	0.125 - ≥256	0.5	128	0.5 - 32	8	8	≤0.06 - 4	1	2
Amikacin	1 - ≥256	8	32	0.5 - 128	32	64	0.25 - 16	4	8
Arbekacin	0.25 - 8	0.5	2	0.25 - 64	16	32	0.25 - 16	4	4
Ciprofloxacin	≤0.06 - ≥256	16	128	≤0.06 - 64	1	2	≤0.06 - 16	≤0.06	≤0.06
Levofloxacin	≤0.06 - ≥256	8	≥256	≤0.06 - 64	1	2	≤0.06 - 8	≤0.06	≤0.06
Tosufloxacin	≤0.06 - ≥32	4	≥32	≤0.06 - ≥32	0.125	0.25	≤0.06 - ≥32	≤0.06	≤0.06
Gatifloxacin	≤0.06 - ≥256	2	64	≤0.06 - 16	0.25	0.5	≤0.06 - 8	≤0.06	≤0.06
Pazufloxacin	0.125 - ≥256	1	≥256	≤0.06 - 128	2	4	≤0.06 - 32	≤0.06	≤0.06
Moxifloxacin*	≤0.06 - 64	2	32	≤0.06 - 8	0.25	0.5	≤0.06 - 8	≤0.06	≤0.06
Minocycline	≤0.06 - 32	0.25	16	≤0.06 - 64	4	16	0.125 - 8	0.25	1
Erythromycin	0.125 - ≥256	≥256	≥256	≤0.06 - ≥256	≥256	≥256	0.25 - 32	4	8
Clarithromycin	0.125 - ≥128	≥128	≥128	≤0.06 - ≥128	≥128	≥128	0.5 - 64	8	16
Azithromycin	0.25 - ≥128	≥128	≥128	≤0.06 - ≥128	≥128	≥128	≤0.06 - 4	0.5	1
Telithromycin	≤0.06 - ≥64	≥64	≥64	≤0.06 - 4	≤0.06	0.25	≤0.06 - 8	2	4
Clindamycin	≤0.06 - ≥256	≥256	≥256	≤0.06 - ≥256	32	≥256	≤0.06 - 128	8	16
Vancomycin**	0.5 - 2	1	2	≤0.06 - 0.5	0.25	0.5			
Teicoplanin	0.125 - 4	1	1						
Linezolid**	1 - 8	2	2	≤0.06 - 2	0.5	1			
Oxacillin	≤0.06 - ≥256	128	≥256						
Cefoxitin	2 - ≥256	64	≥256						

* : *S. aureus* 415 strains、*S. pneumoniae* 468 strains、*H.influenzae* 393 strains
** : *S. pneumoniae* 468 strains

Conclusion and Discussion:

- Nationwide surveillance of bacterial pathogens in adult respiratory tract infections showed the following tendency.
- MRSA infection was significantly high among inpatients with HAP. It was noticeable that MRSA infection was as high as that of outpatients.
- Frequency of penicillin-nonsusceptible *S. pneumoniae* was 30 – 50%, irrespective of stratifications of patients.
- Ampicillin-nonsusceptible *H. influenzae* were significantly high in all types of respiratory infection in Japan.