P 1604

Nationwide surveillance of bacterial pathogens isolated from patients with lower respiratory infections in 2010 in Japan

A.Watanabe[1)], T.Matsumoto[1)], A.Iwamoto[1)], K .Totsuka[1)],N.Aoki[1)], K.Yanagihara[1)], T.Matsumoto[1)], M.Yagisawa[1)],J.Sato[1)], K.Sunakawa[1)] & H.Hanaki[2)]

1)On behalf of the Surveillance Committee of Japanese Society of Chemotherapy, Japanese Association for Infectious Diseases and Japanese Society for Clinical Microbiology.

& 2)Research Center for Anti-infectious Drugs, Kitasato University, Tokyo, Japan

Introduction

The 5th nationwide surveillance of bacterial respiratory pathogens in 2010 has been excuted by a team of three academic societies of Japan.

Materials & Methods

1) Surveillance period: January - September, 2010
2) Cooperative institutes: 33 Hospitals throughout Japan.
3) Strains tested: Isolated from sputum, trans-tracheal aspirates (TTA) including bronchoscopy (identified by qualitative culture and Gram-staining etc) of adult patients who was well-diagnosed as respiratory tract infection(RTI) [community-acquired pneumonia (CAP), hospital-acquired pneumonia (HAP), acute exacerbations of chronic respiratory diseases (AECRD), and others].
4) Antibacterial agents tested: 42 agents as listed in Table 2.
5) Susceptibility test: Conducted at the surveillance central laboratory (Kitasato University, Lab. for Antimicrob. Agents) according to the CLSI standards for broth microdilution methods.
6) For classification of penicillin susceptibility in *Streptococcus pneumoniae*, M-100 S-17 (January, 2007) was employed.
7) Determination of β-lactamase: Nitocefin method for detection of *Haemophilus influenzae* penicillinaze.

Table 1 Number of bacterial strains tested

Bacterial species	2006	2007	2008	2009	2010
Staphylococcus aureus	205	226	189	130	206
Streptococcus pneumoniae	200	257	211	127	190
Streptococcus pyogenes	9	6	6	4	4
Moraxella catarrhalis	91	120	106	70	74
Haemophilus influenzae	165	206	187	123	182
Klebsiella pneumoniae	74	122	126	78	139
Pseudomonas aeruginosa	143	171	162	103	160
Total	887	1108	987	635	955

Fig.1 Proportions of MRSA and MSSA isolated in past five years

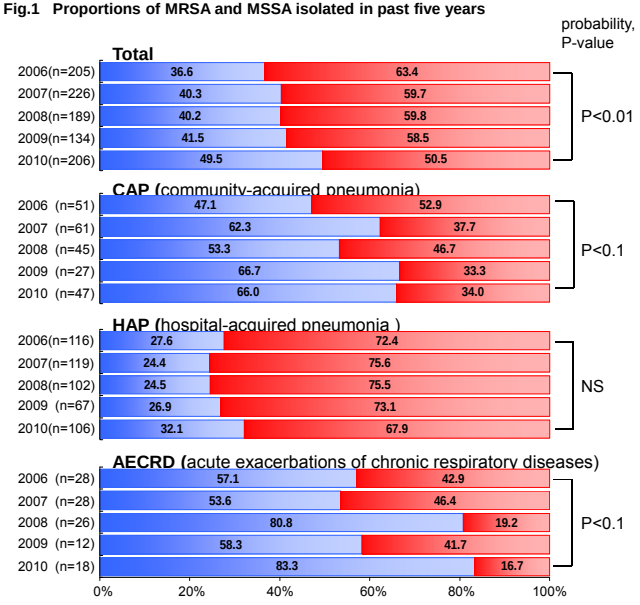

Fig.2 Proportions of PSSP,PISP and PRSP isolated in past five years

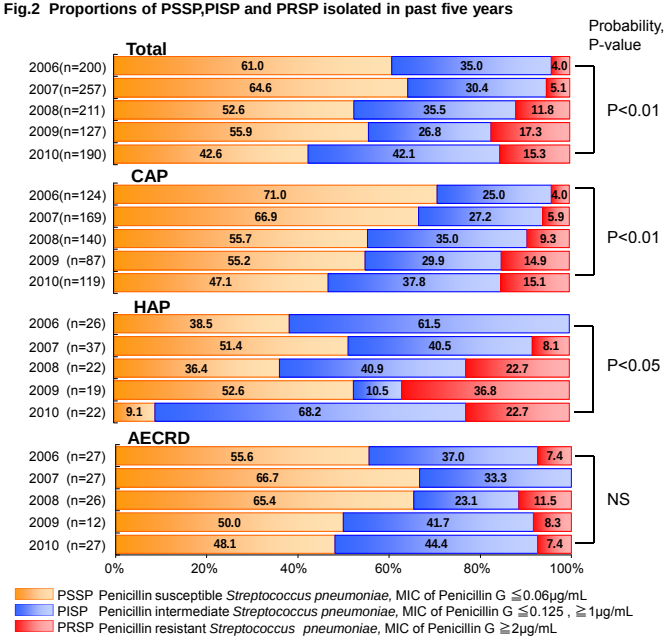

Fig.3 Proportions of BLNAS,BLNAI,BLNAR and BLPAR isolated in past five years

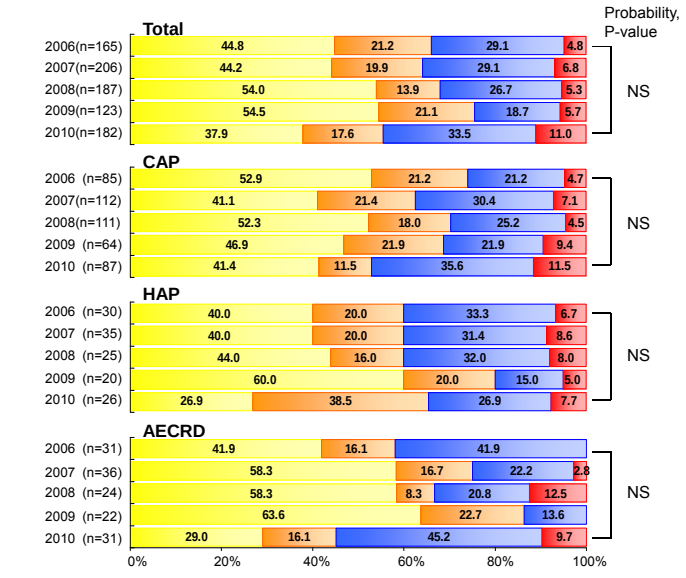

Table 2 Susceptibillity of 3 major respiratory pathogens to antibacterial agents【MIC_{90}(μg/mL)】

Antibacterial agent	*Staphylococcus aureus*				*Streptococcus pneumoniae*		*Haemophilus influenzae*	
	MSSA		MRSA					
	2006	2010	2006	2010	2006	2010	2006	2010
	n = 75	n = 102	n = 130	n = 104	n = 200	n = 190	n = 165	n = 182
Penicillin G	16	8	64	32	1	2	8	32
Ampicillin	16	4	64	32	2	2	8	32
Ampicillin-sulbactam	2	1	32	32	2	2	4	8
Amoxicillin-clavulanic acid	2	1	32	32	1	1	8	8
Piperacillin	32	8	≥ 256	≥ 256	2	2	0.25	1
Piperacillin-tazobactam	2	1	≥ 256	≥ 256	2	2	0.125	0.125
Cefaclor	4	2	≥ 256	≥ 256	32	64	64	64
Cefdinir	0.5	0.5	≥ 128	≥ 128	4	4	8	8
Cefcapene	1	1	≥ 256	≥ 256	0.5	1	2	2
Cefditoren	1	1	≥ 128	≥ 128	0.25	0.5	0.25	0.25
Cefazolin	1	0.5	≥ 256	≥ 256	2	2	128	128
Cefmetazole	2	1	64	128	4	16	8	32
Cefotiam	1	1	≥ 256	≥ 256	2	4	64	64
Ceftazidime	8	8	≥ 128	≥ 128	8	8	0.5	0.5
Ceftriaxon	4	4	≥ 256	≥ 256	1	1	0.5	0.25
Cefepime	4	2	≥ 256	≥ 256	1	1	2	2
Cefozopran	1	1	64	64	1	1	16	16
Imipenem	≤ 0.06	≤ 0.06	64	64	0.125	0.25	4	2
Panipenem	≤ 0.06	≤ 0.06	32	32	≤ 0.06	0.125	2	2
Meropenem	0.125	0.125	32	32	0.25	0.25	0.5	0.25
Biapenem	≤ 0.06	≤ 0.06	64	64	0.25	0.25	8	4
Doripenem	≤ 0.06	≤ 0.06	16	16	0.25	0.25	1	1
Faropenem	–	0.125	–	≥ 256	–	0.25	–	2
Aztreonam							2	2
Gentamicin	32	8	128	64	8	8	1	2
Tobramycin	–	8	–	≥ 256	–	32	–	4
Amikacin	8	4	32	16	128	64	8	8
Arbekacin	1	0.5	2	1	32	32	4	4
Erythromycin	≥ 256	≥ 256	≥ 256	≥ 256	≥ 256	≥ 256	4	8
Clarithromycin	≥ 128	≥ 128	≥ 128	≥ 128	≥ 128	≥ 128	8	8
Azithromycin	≥ 128	≥ 128	≥ 128	≥ 128	≥ 128	≥ 128	1	2
Telithromycin	0.25	–	≥ 64	–	0.25	–	2	–
Ciprofloxacin	1	1	≥ 256	≥ 256	2	2	≤ 0.06	≤ 0.06
Levofloxacin	0.5	0.5	≥ 256	≥ 256	2	2	≤ 0.06	≤ 0.06
Tosufloxacin	0.25	0.125	≥ 32	≥ 32	0.25	0.25	≤ 0.06	≤ 0.06
Gatifloxacin	0.125	–	64	–	0.5	-	≤ 0.06	–
Moxifloxacin	–	0.125	–	32	–	0.25	–	≤ 0.06
Pazufloxacin	0.25	0.25	≥ 256	≥ 256	2	4	≤ 0.06	≤ 0.06
Garenoxacin	–	≤ 0.06	–	32	–	≤ 0.06	–	≤ 0.06
Sitafloxacin	–	≤ 0.06	–	8	–	≤ 0.06	–	≤ 0.06
Minocycline	0.25	0.125	16	16	8	32	0.5	0.5
Clindamycin	0.5	0.25	≥ 256	≥ 256	≥ 256	≥ 256	16	16
Vancomycin	1	1	1	1	–	0.5		
Teicoplanin	1	1	2	2	–	0.125		
Linezolid	4	2	4	2	–	1		
Oxacillin	0.5	0.5	≥ 256	≥ 256				
Cefoxitin	4	4	≥ 256	≥ 256				

: decreased a 4-fold : increased a 4-fold

Conclusion and Discussion:

This study analyzed the causative agents of well-diagnosed respiratory infections in Japan rather than the total isolates. Therefore, the results are true reflection of the epidemics of the respective pathogens. Statistic analysis was executed only on the data of 2006 and 2010. Following results were obtained.

1). The isolation frequency of MRSA was significantly reduced (p<0.01).
2). The frequencies of PISP and PRSP were significantly increased (p<0.01).
3). The MIC of ampicillin, piperacillin and gentamicin in MSSA decreased a 4-fold, yet that in MRSA was unchanged or marginal.
4). The MIC of minocycline in *S. pneumoniae* increased a 4-fold and that of penicillin G, ampicillin and cefmetazole in *H. influenzae* increased a 4-fold. The MICs of remaining antibiotics in both *S.pneumoniae* and *H. influenzae* were steady.

The decreased isolation frequency of MRSA is most likely attributable to the controlled and proper use of antibiotics. However, the frequency of PISP and PRSP seems to be increasing that has to be conducted by the academic societies executed this surveillance studies.