Department of Infection Control

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General Summary

Our clinical research has clarified the characteristics of infectious diseases to facilitate accurate diagnosis and early treatment.   In addition, we have demonstrated that active intervention by the Infection Control Team (ICT) can reduce the transmission of methicillin-resistant *Staphylococcus aureus* (MRSA).   On the other hand, our studies of biofilm formation will clarify the mechanism of refractory bacterial infection.   Thus, our investigations will lead to more effective therapies for infectious diseases and help prevention of the spread of infections.

Research Activities

Clinical studies of extended-spectrum β-lactamase-producing Enterobacteriaceae isolated from urine

We studied the clinical features of 78 patients with extended-spectrum β-lactamase-producing Enterobacteriaceae isolated from urine.   The most frequently isolated organism was *Escherichia coli*.   Of the patients, 32 were outpatients, and among the patients who were hospitalized, 12 had community-acquired infections and 34 had hospital-acquired infections.   Of the patients with community-acquired infection, 11 had been admitted from nursing homes or other hospitals.   Indwelling urinary catheters had been present in 24 patients with hospital-acquired infection.   Initial treatments failed in 57.1% of patients with febrile urinary tract infection and in 41.4% of patients with afebrile urinary tract infection.   The resistance rate of *E. coli* to levofloxacin was 79.5%, but that to fosfomycin was only 11.0%.

Evaluation of the role of the ICT in MRSA transmission

The ICT was established 2008 and started a standard precaution campaign and repeated role-playing education in 2009.   The ICT made efforts in the education of standard precaution practices in The Jikei University Hospital and examined the use of alcohol hand solution gloves, and gowns and the incidence of MRSA (newly positive cases 48 hours after admission/total patient days).   We investigated the effects of our educational approach on controlling infections with MRSA.   Since the private rooms are not enough in our hospital, all the patient who acquired MRSA were not isolated in private room other than the patient who is low activity of daily living.   From April 1, 2007, to December 31, 2010, the yearly usage rates of alcohol hand solution and gowns in hospital increased from 2.99 to 5.03 and from 0.61 to 1.39, respectively.   In contrast, the hospital-wide incidence of MRSA decreased from 0.65 to 0.47.   These results suggest that the improvement in standard precaution compliance reduces hospital-wide MRSA transmis-

sion, although the incidence of MRSA is higher in Japan than in European countries.

Risk factors for mortality in patients with bacteremia due to Pseudomonas aeruginosa
We performed retrospective analyses to determine risk factors for mortality among patients with bacteremia caused by *P. aeruginosa*.   A total of 134 patients with *P. aeruginosa* bacteremia were identified from April 2003 through March 2010.   The 30-day mortality rate among all patients with *P. aeruginosa* bacteremia was 20.9%.   This study revealed that factors indicating a poor prognosis were thrombocytopenia and polymicrobial *P. aeruginosa* bacteremia.   On the other hand, mortality was not affected by inappropriate initial empirical antimicrobial treatment.

Vertebral osteromyelitis due to biofilm producing Staphylococcus epidermidis
We reported a case of spondylitis due to *S. epidermidis*.   Biofilm forming assay revealed this *S. epidermidis* produced biofilms on polystyrene surfaces in broth medium.   We found that other biofilms of *S. epidermidis* were susceptible to a polysaccharide-degradative enzyme.   These findings suggest that polysaccharide is a major matrix adhesin in *S. epidermidis* biofilms.

Clinical characteristics of the patients with primary human immunodeficiency virus infection
We reviewed cases of primary human immunodeficiency virus (HIV) infection in our hospital and analyzed their clinical characteristics.   Ten patients were included in this study.   Frequent symptoms were fever, pharyngitis, lymphadenopathy, and skin eruption.   Common laboratory abnormalities were neutropenia, thrombocytopenia, and elevated serum levels of aminotranferases.   Acquired immunodeficiency syndrome developed in only 2 patients, who showed esophageal candidiasis and pneumocystis pneumonia.   Patients with primary HIV infection, who are at high risk of transmission, greatly affect public health.   We must recognize that patients with infectious mononucleosis–like symptoms must be examined serologically for HIV and that early diagnosis of HIV infection is important in high-risk groups.

Evaluation of the transmission route of Entaemoeba hystolytica in patients with amoebic dysentery in our hospital
We reviewed 19 patients with amoebic dysentery in The Jikei University Hospital from January 1, 2006, to December 31, 2010.   Eighteen of the 19 patients were men, and the mean age was 45.8 years.   Thirteen patients had amoebic colitis, 2 patients had amoebic liver abscesses, and 1 patient had amoebic liver and brain abscesses.   Routes of transmission were sexual contact in 7 patients and travel abroad in 4 patients.   For the infection control of sexually transmitted diseases, safer sex with condoms is important.   Moreover, a greater emphasis should be placed on sexually transmitted diseases, such as amoebic dysentery, that are acquired via the fecal-oral route.

Publications

Hori S, Kono S. Safety profile of intravenous levofloxacin (500 mg once a day) (in Japanese). *Nihon Kagaku Ryoho Gakkai Zasshi.* 2011; **59** Suppl 1: 46-54.

Hori S, Maki N. Postmarketing surveillance of garenoxacin tablets (in Japanese). *Nihon Kagaku Ryoho Gakkai Zasshi.* 2011; **59:** 495-511.

Hori S. Safety profile of antimicrobial agents (in Japanese). *Yakugaku Zasshi.* 2011; **131:** 1423-8.

Hori S. The appropriate antibiotics treatment for eldery persons, pregnant women and the patients with liver or renal damage (in Japanese). *Shindan to Chiryo.* 2012; **100:** 367-73.

Hori H, Uchino K, Yamaguchi H, Matsumoto T, Kuroyanagi K, Yoshida S, Takahashi M, Kodama H, Hamajima S, Yonemochi R, Kobayashi F, Yamanouchi N, Suzuki T, Shiozawa T, Yamaguchi F. Safety and efficacy of levofloxacin 500 mg once a day (in Japanese). *Nihon Kagaku Ryoho Gakkai Zasshi.* 2011; **59:** 614-33.

Yoshida M, Horino T, Tamura K, Hoshina T, Kawano S, Kato T, Sato F, Nakazawa Y, Yoshikawa K, Hori S, Onodera S. Health management in social welfare facilitis during an epidemic of new type influenza (in Japanese). *Nihon Kankyo Kansen Gakkaishi.* 2011; **26:** 299-304.

Horino T, Chiba A, Kawano S, Kato T, Sato F, Maruyama Y, Nakazawa Y, Yoshikawa K, Yoshida M, Hori S. Clinical characteristics and risk factors for mortality in patients with bacteremia caused by Pseudomonas aeruginosa. *Intern Med.* 2012; **51:** 59-64.

Kato T, Tamura K, Hoshina T, Kawano S, Sato F, Horino T, Nakazawa Y, Yoshikawa K, Yoshida M, Onodera S, Hori S. Clinical characteristics in primary HIV infection patients (in Japanese). *Nihon Seikansensho Gakkaishi.* 2011; **22:** 137-41.

Kohno S, Watanabe A, Aoki N, Niki Y, Kadota J, Fujita J, Yanagihara K, Kaku M, Hori S. Clinical phase III comparative study of intravenous levofloxacin and ceftriaxone in community-acquired pneumonia treatment (in Japanese). *Nihon Kagaku Ryoho Gakkai Zasshi.* 2011; **59** Suppl 1: 32-45.

Kohno S, Watanabe A, Aoki N, Niki Y, Kadota J, Fujita J, Yanagihara K, Kaku M, Hori S. Multicenter open-label phase II/III study of intravenous levofloxacin in subjects with respiratory tract infection (in Japanese). *Nihon Kagaku Ryoho Gakkai Zasshi.* 2011; **59** Suppl 1: 18-31.

Kizu J, Yamakawa Y, Maezawa K, Terajima T,

Yoshida M, Hori S. A questionnaire survey on the use of intracutaneous reaction tests at hospital pharmacies (in Japanese). *Nihon Kagaku Ryoho Gakkai Zasshi.* 2011; **59:** 366-73.

Kizu J, Fukuda H, Hori S. Internet survey on current status of patients on antihistamines survey 1 symptoms and treatments (in Japanese). *Arerugi Meneki.* 2011; **18:** 1180-9.

Kizu J, Fukuda H, Hori S. Internet survey on current status of patients on antihistamines survey 2: level of patient understanding and instructions for drug compliance (in Japanese). *Arerugi Meneki.* 2011; **18:** 1190-8.

Kizu J, Fukuda F, Hori S. The influence of histamine antagonist on driving (in Japanese). *Iyakuhin Sogo Sayo Kenkyu.* 2011; **34:** 135-43.

Iwata S, Kusachi S, Sato J, Higa F, Hori S, Maruo A, Watanabe S, Watanabe J. Actual condition survey of intradermal reaction for allergy screening and anaphylaxis due to antibiotics (in Japanese). *Nihon Kagaku Ryoho Gakkai Zasshi.* 2012; **60:** 47-50.

Reviews and Books

Hori S. The appropriate antibiotics treatment for efficacy and suppression of drug resistance (in Japanese). *Tokyoto Byoin Yakuzaishikai Zasshi.* 2012; **61:** 19-23.

Hori S. Side effects and drug interactions of antibiotics (in Japanese). *Kansen to Kokinyaku.* 2012; **15:** 85-92.

Horino T. The appropriate choice and dosage of antibiotics (in Japanese). *Clinical Pharmacist.* 2011; **3:** 515-23.

Horino T, Yoshida M. Renal impairment in HIV-1 infected patients (in Japanese). *Kagakuryoho no Ryoiki.* 2012; **28:** 120-8.

Horino T. Diabetes and urinary tract infection (in Japanese). *Diabetes Frontier.* 2012; **23:** 9-13.

Kato T. AIDS-unrelated malignant Diseases (in Japanese). *HIV Kansensho to AIDS no Chiryo.* 2011; **2:** 34-40.

Kato T. Results of blood test in HIV patients (in Japanese). *Chiryo.* 2011; **93:** 2199-202.

Kuruma S, Kato T. Amebic colitis (in Japanese). In: Egawa N, Monoma K, Suganuma A, Masuda G, editors. Atlas of gastroenterological endoscopy. Osaka: Iyaku Janarusha; 2011. p. 250-1.

Kato T. AIDS-unrelated malignant Diseases (in Japanese). *Nihon AIDS Gakkaishi.* 2011; **13:** 51-3.