Department of Infection Control

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Research Activities

Epidemiological research on sexually transmitted diseases
From 2003 through 2005, the "Study Group on Prevention of the Spread of Sexually Transmitted Diseases," with Dr. Onodera as the chief investigator, was supported by a Grant-in-Aid for Scientific Research of the Ministry of Health, Labor and Welfare (Research Project on Emerging and Re-emerging Infectious Diseases). Since 2006, however, part of this research has continued as a new research project of the Ministry of Health, Labor and Welfare under the title "Research on Promotion of Policies for Prevention of Specified Infectious Diseases Related to Sexually Transmitted Diseases," with Dr. Onodera as the chief investigator. Based on the contents of the "Policies for Prevention of Specified Infectious Diseases related to Sexually Transmitted Diseases" revised in 2006, the objective of this study group was research and development to prevent the onset and spread of sexually transmitted diseases (STDs) and to promote measures against STDs. The main research topics included: 1) epidemiological survey of onset trends for STDs, 2) exploratory research on early discovery of STDs in young people and links to treatment, 3) development of rapid and high precision test methods for genital herpes and condyloma acuminata (genital warts), and 4) surveillance of drug-resistant gonococci and development of diagnostic and therapeutic methods for gonococcal infections of the pharynx. Topics 2, 3, and 4 are research continued from the previous study group, but the epidemiological survey of onset trends for STDs is a newly developed research topic from this year. At present, trends for 6 STDs in Japan are being surveyed: syphilis, human immunodeficiency virus/acquired immunodeficiency syndrome, genital Chlamydia infections, gonococcal infections, genital herpes virus infections, and condyloma acuminata. For the first 2 diseases, notification of all cases is required, and for the other 4 diseases, onset trends are surveyed with a fixed-point method. Selection of the designated reporting institutions for the fixed-point surveys is the responsibility of each local government. No problems with the method of selection have been found, and surveillance to validate the survey method has not been performed recently. The Study Group surveyed all cases of STD in a limited area to validate the fixed-point survey, and the suitability of the fixed-point survey was examined. This year, 4 model prefectures were selected: Chiba, Ishikawa, Gifu, and Hyogo. With the cooperation of the Japan Medical Association, prefectural medical associations, and associations of clinicians in each region, all-case surveys of STDs were performed for each region, and the suitability of the fixed-point surveys was confirmed.

Hospital-acquired infections by drug-resistant bacteria and measures against them
In the 3-year period from April 1, 2003, to March 31, 2006, detection conditions of *Pseudomonas aeruginosa*, drug sensitivity, and doses of injectable antibacterial agents

used were surveyed with *P. aeruginosa* isolated from inpatients at affiliated hospitals and patients in whom *P. aeruginosa* was detected as subjects. The doses of injectable antibacterial agents and resistance to *P. aeruginosa* were surveyed in each hospital department, and correlations were examined. The detection conditions of multidrug-resistant *P. aeruginosa* (MDRP) and doses of injectable antibacterial agents were surveyed and compared in patients in whom MDRP was detected and in patients showing resistance to 1 or 2 agents among imipenem, amikacin, and levofloxacin. As the doses of the antibacterial agents increased, the resistant bacteria also increased. The doses of the agents were higher in patients in whom imipenem-resistant bacteria were detected than in patients in whom MDRP was detected. If MDRP-positive patients are carriers, the bacteria can be eliminated by discontinuing the antibacterial agent. The methods of using antibacterial agents differ markedly among hospital departments; therefore, the bacteria detected and the doses of agents used must be understood, and guidelines are necessary. In our hospital, there are no restrictions on the use of antibacterial agents, but we recommend that guidelines be established.

Measures against norovirus outbreaks
Outbreaks of norovirus in medical institutions have become a problem in recent years. When cases of such infections were analyzed in our hospital, the possibility that the virus is spread by inappropriate treatment of vomited matter cannot be ruled out; therefore, adding preventive measures against airborne infections appears necessary. When outbreaks do occur, the cost of using personal protection equipment (PPE) is clearly less than the loss to hospitals by admission restrictions. In molecular biological surveys of patients, outbreaks in the winter of 2005 and 2006 were caused mainly by the G (Kan??) 4 type virus. Long-term virus excretion was observed more often in children than in adults, and virus reservoirs have been found in hospitals. The transcription-reverse transcription concerted assay has been introduced as a diagnostic method for norovirus and has been suggested to be as sensitive as the reverse transcriptase polymerase chain reaction method for the G (Kan??) 4 virus. We believe transcription-reverse transcription concerted assay is a useful measure against hospital-acquired infections because of its simplicity.

Study of antibacterial drug treatment of abdominal typhus
The current first-line therapy for abdominal typhus in Japan is new quinolones, but patients not responding to new quinolones have increased in recent years. The usefulness of various antibacterial agents and drug-sensitivity tests were examined in patients with typhus at our hospital. Many of the strains of *Salmonella typhi* and *Salmonella paratyphi* A detected from these patients showed resistance to nalidixic acid and were classified as having low sensitivity to new quinolones. In patients with bacterial infections showing low sensitivity to new quinolones, the response rate to new quinolones was low, and coadministration of third-generation cephems or switching to a sulfmethoxazole-trimethoprim combination drug was necessary. Therapeutic effects on abdominal typhus were consistent with the results of in vitro drug sensitivity tests. An analysis with the checkerboard method revealed either synergistic or additive effects for

coadministration of a new quinolone with a third-generation cephem.   In treatment of abdominal typhus, drug-sensitivity tests should be performed promptly, and drugs should be selected on the basis of the results.

Publications

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Books

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