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CONTENTS/SUMMARIES

Summary: Kawasaki syndrome (KS) is an acute, sometimes fatal vasculitis of young children. KS has replaced acute rheumatic fever as the most common cause of acquired heart disease in children in the United States. The illness is manifested by prolonged fever, conjunctival injection, enanthem, exanthem, erythema and swelling of the hands and feet, and cervical adenopathy. These acute features of illness are self-limiting, but coronary artery abnormalities occur in 20% of untreated patients. The etiology of the illness is unknown, but its clinical and epidemiologic features are most consistent with an infectious cause. Common cardiovascular manifestations of the illness include myocarditis, pericardial effusion, and coronary artery aneurysm formation. Treatment with intravenous gamma globulin (IVGG) and aspirin within the first 10 days of illness reduces the prevalence of coronary artery abnormalities from 20% in those treated with aspirin alone to 4%. Patients who develop coronary artery aneurysms, particularly those who develop giant coronary artery aneurysms, may suffer myocardial infarction secondary to thrombosis or stenosis in the abnormal vessel. Additional research to determine the cause of KS is urgently needed to allow for improved diagnosis, more specific therapy, and prevention of the disorder.

Summary: Although not life-threatening, onychomycosis (a fungal infection of the nail, usually caused by a dermatophyte) constitutes an important public health problem because of its high prevalence (about 10% of the U.S. population) and associated morbidity. The disease can have certain negative consequences for patients, such as pain, and can potentially undermine work and social lives. This review discusses the etiology, classification, diagnosis, and treatment of onychomycosis. Four types of onychomycosis are recognized based on the site and pattern of fungal invasion. Dermatophyte fungi are the predominant pathogens, but yeasts (especially Candida albicans) and nondermatophyte molds may also be implicated. Accurate diagnosis requires direct microscopy and fungal culture. The differential diagnosis includes psoriasis, lichen planus, onychogryphosis, and nail trauma. Onychomycosis is more difficult to treat than most dermatophytoses because of the inherent slow growth of the nail. Older antifungal agents (ketoconazole and griseofulvin) are unsuitable for onychomycosis because of their relatively poor efficacy and potential adverse effects. Three recently developed antimycotic agents (fluconazole, itraconazole, and terbinafine) offer high cure rates and good safety profiles. In addition, the short treatment times (<3 months) and intermittent dosing schedules are likely to enhance compliance and reduce the costs of therapy.

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Summary: Respiratory syncytial virus (RSV) is the most important cause of viral lower respiratory tract illness (LRI) in infants and children worldwide and causes significant LRI in the elderly and in immunocompromised patients. The goal of RSV vaccination is to prevent serious RSV-associated LRI. There are several obstacles to the development of successful RSV vaccines, including the need to immunize very young infants, who may respond inadequately to vaccination; the existence of two antigenically distinct RSV groups, A and B; and the history of disease enhancement following administration of a formalin-inactivated vaccine. It is likely that more than one type of vaccine will be needed to prevent RSV LRI in the various populations at risk. Although vector delivery systems, synthetic peptide, and immune-stimulating complex vaccines have been evaluated in animal models, only the purified F protein (PFP) subunit vaccines and live attenuated vaccines have been evaluated in recent clinical trials. PFP-2 appears to be a promising vaccine for the elderly and for RSV-seropositive children with underlying pulmonary disease, whereas live cold-passaged (cp), temperature-sensitive (ts) RSV vaccines (denoted cpts vaccines) would most probably be useful in young infants. The availability of cDNA technology should allow further refinement of existing live attenuated cpts candidate vaccines to produce engineered vaccines that are satisfactorily attenuated, immunogenic, and phenotypically stable.

Summary: Despite strong epidemiological evidence supporting an important role for Campylobacter upsaliensis as a human enteropathogen, it remains relatively unknown in the realm of clinical microbiology. Clinical studies indicate that infection with this organism usually is associated with benign self-limiting diarrhea. However, more serious illnesses, including spontaneous abortion and hemolytic-uremic syndrome, recently have been associated with human infections. Understanding of the virulence properties and molecular biology of C. upsaliensis is beginning to evolve. There is now a pressing need for controlled, prospective epidemiologic studies in addition to further in-depth investigation of the pathogenesis of this enteric campylobacter to more precisely define its role in human disease. Furthermore, since C. upsaliensis is sensitive to the antibiotics routinely used in Campylobacter selective media, widespread appreciation of the importance of this organism will rely on the development of widely applicable, effective techniques for its isolation.

Summary: Since their initial recognition 20 years ago, Shiga toxin-producing Escherichia coli (STEC) strains have emerged as an important cause of serious human gastrointestinal disease, which may result in life-threatening complications such as hemolytic-uremic syndrome. Foodborne outbreaks of STEC disease appear to be increasing and, when mass-produced and mass-distributed foods are concerned, can involve large numbers of people. Development of therapeutic and preventative strategies to combat STEC disease requires a thorough understanding of the mechanisms by which STEC organisms colonize the human intestinal tract and cause local and systemic pathological changes. While our knowledge remains incomplete, recent studies have improved our understanding of these processes, particularly the complex interaction between Shiga toxins and host cells, which is central to the pathogenesis of STEC disease. In addition, several putative accessory virulence factors have been identified and partly characterized. The capacity to limit the scale and severity of STEC disease is also dependent upon rapid and sensitive diagnostic procedures for analysis of human samples and suspect vehicles. The increased application of advanced molecular technologies in clinical laboratories has significantly improved our capacity to diagnose STEC infection early in the course of disease and to detect low levels of environmental contamination. This, in turn, has created a potential window of opportunity for future therapeutic intervention.

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Summary: Dengue fever, a very old disease, has reemerged in the past 20 years with an expanded geographic distribution of both the viruses and the mosquito vectors, increased epidemic activity, the development of hyperendemicity (the cocirculation of multiple serotypes), and the emergence of dengue hemorrhagic fever in new geographic regions. In 1998 this mosquito-borne disease is the most important tropical infectious disease after malaria, with an estimated 100 million cases of dengue fever, 500,000 cases of dengue hemorrhagic fever, and 25,000 deaths annually. The reasons for this resurgence and emergence of dengue hemorrhagic fever in the waning years of the 20th century are complex and not fully understood, but demographic, societal, and public health infrastructure changes in the past 30 years have contributed greatly. This paper reviews the changing epidemiology of dengue and dengue hemorrhagic fever by geographic region, the natural history and transmission cycles, clinical diagnosis of both dengue fever and dengue hemorrhagic fever, serologic and virologic laboratory diagnoses, pathogenesis, surveillance, prevention, and control. A major challenge for public health officials in all tropical areas of the world is to devleop and implement sustainable prevention and control programs that will reverse the trend of emergent dengue hemorrhagic fever.

Summary: Since its emergence 25 years ago, group B streptococcus has become recognized as a cause of serious illness in newborns, pregnant women, and adults with chronic medical conditions. Heavy colonization of the genital tract with group B streptococcus also increases the risk that a woman will deliver a preterm low-birthweight infant. Early-onset infections (occurring at <7 days of age) are associated with much lower fatality than when they were first described, and their incidence is finally decreasing as the use of preventive antibiotics during childbirth increases among women at risk. New serotypes of group B streptococcus have emerged as important pathogens in adults and newborns. Clinical and laboratory practices—in obstetrics, pediatrics, and clinical microbiology—have an impact on disease and/or its prevention, and protocols established at the institutional level appear to be critical tools for the reduction of perinatal disease due to group B streptococcus. Since intrapartum antibiotics will prevent at best only a portion of the full burden of group B streptococcal disease, critical developments in vaccine evaluation, including study of polysaccharide-protein conjugate vaccines, offer the potential for enhanced prevention in the relatively near future.

Summary: Fifty years after the introduction of the first effective antimicrobial agents against Mycobacterium tuberculosis, this pathogen continues to be a tremendous public health problem. The rise in the number of resistant strains and the difficulties involved in the therapy of tuberculosis in immunocompromised AIDS patients have renewed the interest in the development of effective vaccines. To evaluate whether a potential vaccine against tuberculosis could prevent infection by eliciting a protective antibody response, we reviewed the history of antibody-mediated immunity against tuberculosis. Review of the literature of the past 100 years demonstrates that there is sufficient evidence to conclude that antibody-mediated immunity can modify the course of infection in certain situations. Based on our findings and on what is known in other systems, we propose that the role of antibody-mediated immunity to M. tuberculosis be reexamined, using advanced technology.

Summary: Cytomegalovirus (CMV) is an important pathogen in transplant recipients and human immunodeficiency virus (HIV)-infected individuals. Major progress has been made in developing quantitative detection methods for CMV in recent years. Due to their high sensitivity,

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