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Imported infectious diseases and surveillance in Japan

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Summary Surveillance of imported infectious diseases is important because of the need for early detection of outbreaks of international concern as well as information of risk to the travelers. This paper attempts to review how the Japanese surveillance system deals with imported infectious diseases and reviews the trend of these diseases.

The cases of acquired infection overseas were extracted from the surveillance data in 1999–2008. The incidence and rate of imported cases of a series of infectious diseases with more than one imported case were observed by the year of diagnosis and place of acquired infection.

During the period 10,030 cases that could be considered to be imported infectious diseases were identified. Shigellosis ranked as the most common imported disease, followed by amebiasis, malaria, enterohemorrhagic *Escherichia coli* infection and the acquired immunodeficiency syndrome, typhoid fever, dengue fever, hepatitis A, giardiasis, cholera, and paratyphoid fever. The annual trends of these diseases always fluctuated but not every change was investigated.

The study reveals that the situation of imported infectious diseases can be identified in the current Japanese surveillance system with epidemiologic features of both temporal and geographic distribution of cases of imported infectious diseases. However, further timely investigation for unusual increase in infectious diseases is needed.

Introduction

Because of the current global travel and trade, there is no border for infectious diseases. Even in Japan, which belongs to a temperate climate zone many tropical infectious diseases are found in the local hospitals. But there have been several case reports describing difficulty of early

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diagnosis and treatment.[1–3] It is important to provide information to travelers on particular risks and to increase protection, as well as information for local clinicians on the current situation of endemicity of infections in the foreign countries in order to facilitate early diagnosis and to avoid nosocomial infection. From the viewpoint of public health, the introduction of new pathogens may result in their establishment in the country.

Public health surveillance is one of the essential components for infectious disease control and no doubt a starting point for control. Because of current circumstances a surveillance system should be designed not only at the national level but also at the global level of infectious disease control. Current National Epidemiological Surveillance for Infectious Diseases (NESID) in Japan requires that all notifiable diseases should be reported with the presumptive place of infection. This report summarizes the data from the NESID from 1999 to 2008 on the situation of imported infectious diseases in Japan.

Materials and methods

Surveillance of infectious diseases in Japan

The National Epidemiological Surveillance for Infectious Diseases (hereafter referred to as NESID) is conducted based on the Law Concerning the Prevention of Infectious Diseases and Medical Care for Patients of Infections (hereafter referred to as the Infectious Disease Control Law) enacted in April 1999. Infectious disease surveillance system before then is described elsewhere.[4] Infectious diseases included in this law were categorized into I–V with specific means for control based upon the public health impact of each disease as shown in Table 1.

All physicians must report cases of Categories I–IV immediately and Va within 7 days after identification to local public health centers which are the primary level institution for disease control and prevention located strategically throughout the nation. Local public health centers are expected to enter data into the nationwide electronic surveillance system, which enables data to be shared throughout the system including all local public health centers, local and national governments, quarantine stations, local infectious disease surveillance center, local public health laboratory and central infectious disease surveillance center, which is the Infectious Disease Surveillance center of National Institute of Infectious Diseases. Category Vb diseases, which include sentinel reporting diseases, should be reported by designated sentinel medical institutions weekly or monthly with the number of clinical cases aggregated by sex and age groups. All reports should be compatible with the reporting criteria which were documented in detail for each disease including clinical and laboratory case definitions for categories Va and Vb of hospital sentinel reporting disease, and only clinical case definitions for other Vb sentinel reporting diseases.[5]

Cases of category I–Va diseases should be reported with sex, age, method of laboratory confirmation, symptoms on diagnosis (descriptive), date of onset, date of consultation, date of diagnosis, estimated date of infection, date of death (if patients died), area of permanent residence (in-country or foreign countries), presumptive place of infection (domestic or foreign countries), contact to the vectors or activities on the fields (Yes or No), estimated infection route, another patients in the family members, colleagues, or neighbors (Cluster or NOT). The presumptive place where infection was acquired should be described based on reasonable situation considering travel history and incubation period according to the interview of patients.

Surveillance data and method of analysis

The cases with the presumptive place of infection in a foreign country (hereafter referred to as imported cases) were extracted from the NESID data from April 1999 to March 2008. Data in 1999 are only available in April–December because of the change of the law in April 1999 and data in 2008 are included until March. Finally nine years data are reviewed. Annual trend of total, imported, and domestic cases of disease containing one or more imported one are recorded and attributable events and causes are investigated with information in the line listing data and relevant epidemiological reports. Incidence rates per 1,000,000 population are calculated using the 2002 census population and imported disease per 1,000,000 outbound travelers are calculated using the 2002 outbound travelers by the Japan National Tourist Organization.

Results

In the period observed 10,030 cases that could be considered to be imported infectious diseases were identified. These include various infectious diseases as listed in Table 2 with reported number of cases (imported, domestic, unknown and total), imported case rate among imported and domestic cases, incidence rate of domestic cases per year per 1,000,000 population and the incidence rate of imported cases per year per 1,000,000 outbound travelers.

Shigellosis ranked as the most common imported infection, followed by amebiasis, malaria, enterohemorrhagic *Escherichia coli* (EHEC) infection and the acquired immunodeficiency syndromes (AIDS), typhoid fever, dengue fever, hepatitis A, giardiasis, cholera, and paratyphoid fever. The rate of imported diseases of malaria, dengue fever and rabies is complete as they are not endemic in Japan and over 50% in coccidioidomycosis, paratyphoid fever, typhoid fever, cholera, shigellosis and Echinococcosis (*Echinococcus granulosus*). Although coccidioides is not considered to be indigenous, a domestic case is identified with no history of overseas travel. However, this case was a dealer of imported cotton and he may have acquired the infection from fungi attached to the imported cotton.[6]

The annual trends of imported diseases always fluctuate because of the local situation and sometimes there is sudden increase because of cluster among the same tour groups. The Figure shows the annual trend of selected diseases with a large number of imported diseases every year (Fig. 1 for diarrheal disease and Fig. 2 for febrile diseases). Cholera and giardiasis did not show much change. However, case reports of cholera increased in 2004 with 67 cases, among which many were returning travelers from the Philippines in June